

Editors Column

The year has now come to an end and we are pleased to bring you the latest and final edition of The Crystal for this year. With levels of depletion of natural resources increasing we find ourselves in we look at what we can do to make some changes in our environment with simple mitigation ideas in industry and how we can do our part in minimizing air pollution. With water resources becoming ever more scarce we look at an innovative project being undertaken in South Africa: collecting for and harvesting it as a water supply.

We share with you one of our proudest achievements for this year, the winning of a tender on the rehabilitation of Hwange Power Plant. WE hope you are planning your tree planting activities to celebrate National Tree Planting. Details on how we are celebrating are provided and please enjoy this festive Christmas decorations that you can make this year.

We welcome your comments and environmental contributions to the Editor:

infor@blackcrystal.co.zw

Thank you and happy reading!



**The Black Crystal Team Wishes You a Merry Christmas
And a Prosperous 2014**

Black Crystal Consulting is one of Zimbabwe's leading reputable companies offering a quality service in environmental and socioeconomic consultancy services. Black Crystal Consulting believes in **caring for the environment beyond today** to ensure that biodiversity is maintained and that natural resources are not depleted for the next generation.

Black Crystal Consulting (Pvt) Ltd
1 Fairbairn Drive
Mount Pleasant
Harare
Phone: +263 4 334 361/ 307 466/ 307 458.
Mobile: +263 779 394 179

Energy Saving Tip for Christmas: Go easy on the lights, instead of leaving your fairy lights on your Christmas tree switched on the whole night, switch them off when you are during the day and when you are going to bed.

Upgrading of Hwange Power Station

Black Crystal in association with Epoch Resources, South Africa and Sustainability Australia are proud to announce that they have just been awarded the contract for the Environmental and Social Audit (ESA) and the Environmental and Social Management Plan (ESMP) for Hwange Power Station (HPS). The three companies have built a project specific multi-disciplinary team of key professionals with a wealth of experience and professionalism in the environmental and social field and power sector in order to undertake the study.

Background to the Study

Following the signing of the Global Political Agreement the Zimbabwe Government's agenda was defined by the Short Term Emergency Recovery Programme (STREP). A key priority area was the badly needed rehabilitation and upgrading of the power sector. Against this backdrop a number of donors established a Multi-Donor Trust Fund to provide additional resources required. The African Development Bank was mandated to administer the funds to Zimbabwe.

Project Objective and Activities

The objective of the project is to improve the provision of adequate and reliable power supply in an environmentally sound manner through the rehabilitation of the HPS and the power transmission and distribution facilities in the country. The project should result in an overall improvement in plant operations and allow plant available capacity to increase from 450MW to 780MW.

The project consists of the following main components:

- Rehabilitation of the Hwange Power Plant (HPP) facilities;
- Implementation of the re-designed ESMP; procurement of monitoring equipment and training;
- Conduct an ESA and design of an ESMP Plan; and
- Project Supervision and Auditing

The project activities will mainly comprise repairs and replacement of existing equipment and limited civil works. The Zimbabwe Power Company / Zimbabwe Electricity Supply Authority are committed to rehabilitating and operating the HPP to high environment, health and safety standards.

Baseline Audit and Environmental Survey Program

Black Crystal will undertake an ESA for the HPP which will provide a systematic assessment of past and present environmental and social liabilities associated with the project prior to the physical implementation of the rehabilitation program. The Audit results will constitute the findings, conclusions and recommendations that will be carried forward into the ESMP and require follow-up actions, namely corrective and preventive actions. The findings will be used to revise, re-design, and improve the ESMP where necessary. The ESMP will be a condition of the loan for first disbursement.

The ESMP will clearly elucidate the measures to be taken to protect the environment including observing proper working methods, replacement of destroyed vegetation, ensuring proper disposal of discarded equipment and materials that may contaminate the soil and ground water; prevention of nuisance in terms of dust, noise, odour, etc.

Among positive outcomes, the project is proposed to remediate and mitigate a number of impacts due to lack of maintenance of the HPP plant. Such works shall result in:

- significant reduction in air pollutants;
- significant improvement to the coal handling and disposal system;
- significant improvement and safety considerations for the Ash Dam and Ash Dam area;
- significant development of capacity building; and
- significant enhancement of the environment, livelihood and health protection of workers and people residing in the surrounding areas
- acknowledgement of the existing and potential negative impacts of the power station operations on the ecology of the project area and wider environs, and a commitment to avoid or mitigate the impacts.

Invasive Alien Plants and Management in Africa

Between the period 2005 and 2010 the 'Removing Barriers to Invasive Plant Management in Africa' project was implemented in four African nations (Ethiopia, Ghana, Uganda and Zambia) The project stands out as one of the most wide-ranging and ambitious campaigns yet undertaken in the global effort to 'scale up' the fight against damaging impacts arising from the spread of invasive alien species.

"Invasive Alien Species (IAS) pose one of the most significant threats to biodiversity, agriculture, sustainable economic development and human and animal health on this planet, including increasingly in the African continent.



The following coffee table book has been produced as one of the final outputs of the UNEP/GEF project '2010.' The link to this nicely written and compelling story is <http://www.cabi.org/Uploads/CABI/publishing/promotional-materials/african-invasives-book.pdf>

Can Development and Conservation Mix? By guest writer Ekari Mbvundula

There is an oxymoron that has recently become a normal part of the vocabulary of policy makers and world leaders alike. "Sustainable Development" – this phrase implies that we can grow as a society, build cities, roads, bridges and power plants in such a way that will not cause irreversible damage to the environment and/or ourselves.



Storm water drain beneath a main road

Despite this common phrase, it is widely considered unavoidable to develop the infrastructure of a city or town without destroying vegetation. For example, part of road construction includes the building of storm water drainage systems. The purpose of these drains is to prevent urban flooding caused by runoff over man-made structures. The soil underneath normally would have done the job of absorbing water before it floods, but man-made roads and buildings are non-absorbent. This results in larger volumes of water flowing over the surfaces and a higher probability for flooding.

Storm water drains are constructed to direct this runoff out of residential and city areas, and will often drain into a river or lake. In the example below of a storm water construction site in a township in South Africa, the runoff led through a diverse patch of vegetation, with vibrant insect and bird activity. However, the completed construction of the storm water drain requires the entire channel to be lined with concrete, and the vegetation would be uprooted. The general perception is that this vegetation serves no purpose. But it actually provides a natural filtration system as the water passes through the roots and a great volume of water is absorbed into the soil. With concrete drainage, the water will simply continue to flow and increase in volume, until it reaches the river or lake – which

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may not have the capacity to hold those volumes. As a result, structures designed to prevent flooding may be the cause of floods in the end.

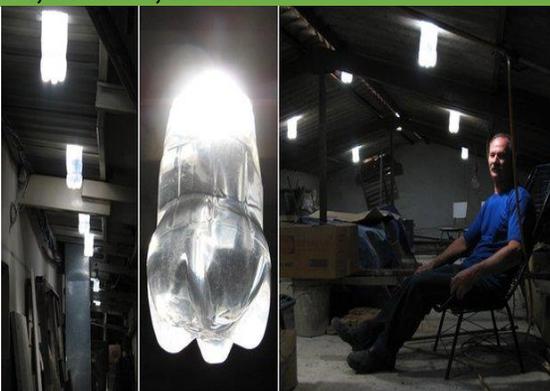


Downstream from the drain in above picture

Development to improve the quality of life for previously disadvantaged communities is important – but is the cost of this development too high for Nature? Natural systems provide a service of cleaning the water and air, but this service is usually assumed to be inferior to man-made solutions. Is it possible to provide for human needs without eliminating nature? There are alternatives which include building around natural systems, uprooting and replanting the same vegetation elsewhere, or planting new vegetation. Currently, contractors are usually unwilling to go this route as it increases construction costs.

More time and effort must go into studying the in-built engineering qualities of natural systems and creating new designs for infrastructure that can integrate them for future cities. Perhaps working with the existing natural systems instead of against them will also decrease construction costs in the long term. Only then can we make “sustainable development” a reality.

Alfredo Moser: Bottle light inventor proud to be poor: By Gibby Zobel, BBC World Service, Uberaba, Brazil



Alfredo Moser's invention is lighting up the world. In 2002, the Brazilian mechanic had a light-bulb moment and came up with a way of illuminating his house during the day without electricity - using nothing more than plastic bottles filled with water and a tiny bit of bleach.

So how does it work? “Simple refraction of sunlight”, explains Moser, as he fills an empty two-litre plastic bottle. “Add two capfuls of bleach to protect the water so it doesn't turn green [with algae]. The cleaner the bottle, the better,” he adds. Wrapping his face in a cloth he makes a hole in a roof tile with a drill. Then, from the bottom upwards, he pushes the bottle into the newly-made hole. “You fix the bottle in with polyester resin. Even when it rains, the roof never leaks - not one drop.” The lamps work best with a black cap - a film case can also be used. Moser has installed the bottle lamps in neighbours' houses and the local supermarket.



What is refraction?



- Refraction is the bending of light, which is caused by a change in its speed
- The speed of light is determined by the density of the substance through which it passes
- So refraction occurs when light passes from one substance to another with a different density - eg from air to water so in the case of the "Moser lamp", sunlight is bent by the bottle of water and spread around the room

Alfredo's invention has received adoration from Ilac Angelo Diaz as well, who is the executive director of the MyShelter Foundation in the Philippines. MyShelter specialises in alternative construction, creating houses using sustainable or recycled materials such as bamboo, tyre and paper. "We had huge amounts of bottle donations," he says. Following the Moser method, MyShelter started making the lamps in June 2011. They now train people to create and install the bottles, in

order to earn a small income. In the Philippines, where a quarter of the population lives below the poverty line, and electricity is unusually expensive, the idea has really taken off, with Moser lamps now fitted in 140,000 homes. The idea has also caught on in about 15 other countries, from India and Bangladesh, to Tanzania, Argentina and Fiji. **Alfredo Moser spoke to Outlook on the BBC World Service. Listen to the interview via [BBC iPlayer Radio](#) or [browse the Outlook podcast archive](#). You can follow the Magazine on [Twitter](#) and on [Facebook](#)**

National Tree Planting Day

In Zimbabwe, The Forestry Commission is responsible for the National Tree planting day which is held on the first Saturday of December. This year's event will be held on the 7th of December 2013. Everyone is encouraged to participate in this national event and to plant trees. Trees play a vital role as they provide oxygen, cleanse soil, control noise pollution, prevents soil erosion, provide shade and windbreaks and food, medicine, building materials and provide a natural habitat for a range of species. Anyone can plant a tree as they are essential for livelihoods. It is our responsibility to conserve trees and forests for the benefit of future generations.

Theme for 2013: "Forests for water and life"

Tree of the year: Red Leaved Fig (*Ficus Ingens*)

Common names: rooiblaarvy (Afrikaans), Umgonswane (Zulu)

Ficus is the classical Latin name termed by the Romans to the shrubby common fig tree, *Ficus Carica* which originated from Asia. The Red Leaved Fig is a fig species with the botanical name *Ficus Ingens* from the family name *Moraceae* which has a most extensive range

and is commonly found in the sub-tropical to dry tropical regions of West, East and Southern Africa. The red leaved fig is a semi-deciduous, green shady tree or sometimes known as a rock splitter and a beautiful species for a rockery garden. Piled fruit or small figs are born in pairs or singly on bare stems or beneath the leaves. The fruits are found throughout the year but are at their peak during summer and early spring.



The Red Leaved Fig tree grows in varied habitats but usually outside forests and preference is on rocky tops, cliffy areas throughout the bush veld, wooden grassland and coastal regions. The roots are strong and spreads along rock faces, penetrates on indiscernible rock cracks, sometimes breaking down the rock. The red leaved fig trees are famous for providing food to fruit eating insects, birds, monkeys and bats. Bark extracts are given to cows with low milk production as it will enhance the quality of milk produced. They produce a milk latex which is used as an alternative disinfectant for iodine. The *Ficus* leaves could be toxic for some animals e.g. cows and could cause nervous disorders when food is scarce in the dry season. Farmers could use this tree in camps for their livestock and to provide shade but should be cautious since the leaves are toxic.

As an organization, we will be celebrating National Tree Planting day. We will be planting the tree of the year at our office premises with our work colleagues.

For further details of the National Tree Planting Day please kindly contact the Forestry Commission personnel on the following:

Forestry Commission in Zimbabwe

1 Orange Grove Drive

Highlands

Harare

Darlington Duwa (General Manager), forestqm@mweb.co.zw or dduwa@forestry.co.zw (+2634498436)

Fire at the Pomona Dumpsite – Air Pollution

At a recent meeting held by Miracle Missions held on the 5th November Mr Chibanda: the Director of Waste Management at City of Harare (COH) explained that on the 20th of October 2013 at around 4am, a fire was lit by a vagrant at Pomona dumpsite which covers an area of over 100 ha. Due to the heavy windy conditions, the dangerous fire spread very quickly and uncontrollably. The toxic airborne matter from the fire travelled in a south westerly direction over Alex Park and Avondale towards the city centre.



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In tackling the massive fire that resulted in dark clouds, noxious odours and air pollution that reduced the air quality in the surrounding residential areas around the dumpsite Mr Chibanda pointed out that the COH were assisted by various organizations which included the Civil Aviation Authority, the Zimbabwe National Army, the Fire Brigade, rate payers and well-wishers who included Miracle Missions. Due to their all hard work, often voluntarily the fire was put out in a record time of 2 weeks.

Mr Chibanda apologized on behalf of City of Harare for all the problems that the fire caused especially the air pollution that affected people with respiratory ailments. The fire released toxins into the air which include carbon dioxide, and dioxins which are caused by burning plastics. Dioxins disrupt hormones in the body, and are extremely carcinogenic causing cancer, deformed offspring, reproductive failures, and autoimmune diseases. After release into the atmosphere they settle on crops and in our waterways. They are persistent, and last for years. In the body they accumulate in body fat and can be passed onto the unborn foetus. They accumulate in animals at the top of the food chain: i.e. humans.



Harare Drive

The burning of polystyrene polymers such as: foam cups, meat trays, egg containers, yogurt and deli containers, releases styrene. Styrene gas can readily be absorbed through the skin and lungs. At high levels styrene vapor can damage the eyes and mucous membranes. Long term exposure to styrene can affect the central nervous system, causing headaches, fatigue, weakness, and depression. These are just two toxic compounds that were released by the fire from discarded batteries, rubber tyres, etc.



Pomona Shops (Photographs courtesy of Dr Lisa Marabini)

Mr Chibanda pointed out that the air pollution monitors have not been working in Harare so there was no way to ascertain how much air pollution was caused. He encouraged people to recycle their waste, especially plastic and not to burn it.

You can register your complaint about air pollution to your local District Office, police station, fire station, or phone EMA on 792772 or 252087.

SCHOOLS RECYCLING COMPETITION: If you are interested in recycling this is a good initiative to get into: You may be interested in looking at a schools programme <https://www.facebook.com/pages/The-Creative-Marketing-Company/163628007177943> being undertaken by Creative Marketing who are working in 160 schools, together with Bakers Inn, Probrands, Kiwi shoe polish and Afriglobal. They have spoken to approximately 240000 children about the dangers of burning plastic, and encouraging them to recycle plastic. The children are collecting Bakers Inn bread packets (which are being recycled into black bin bags) as well as Kiwi shoe polish tins and Probrands Korn Kurtz packets, which are all being recycled. There will be a reward of \$25000 worth of prizes for the Harare school who collects the most Bakers Inn packets, and \$15000 for the top Bulawayo school, as well as sporting equipment from ProBrands, and school furniture from Kiwi, and 12 months free internet and 6 computers from Afriglobal. Get involved today: | contact Diane Thornton creativemarketing@zol.co.zw

The miniSASS WEBSITE GOES LIVE...

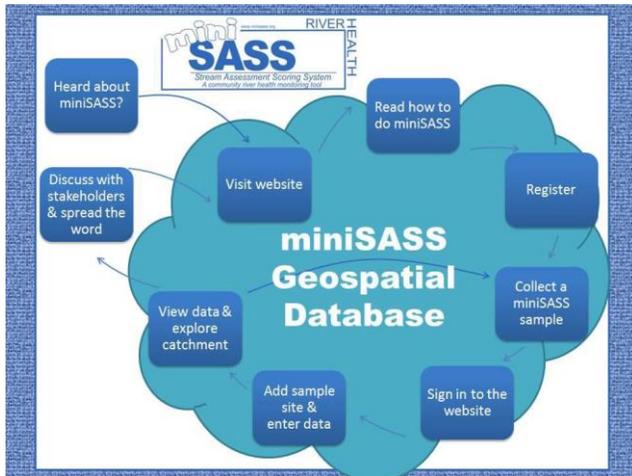


GroundTruth, through some seed funding from the Water Research Commission, have developed the new miniSASS website and database, which has now gone live. The website provides a dedicated home for the miniSASS community river health biomonitoring tool, to promote its use and to serve the miniSASS user community by providing a central hub for river health data, supporting materials, instruction, and news of the latest activities that have taken place.

The most important feature of the new website is the interactive Google Earth map and database, which allows miniSASS users of all ages to explore their catchment, find their river and then upload their miniSASS results. In this way it is anticipated that a public-access, interactive map of river health across Southern Africa will develop, with results continuously contributed by users as citizen science. Users can explore all results, compare and contrast river health across catchments and in relation to land use activities, while connecting with others who are sampling rivers in their community.

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information and score sheet, identification guide and dichotomous key for miniSASS.

For more information or to provide feedback please contact the miniSASS team on: info@minisass.org

DIY: Christmas Decorations

Its Christmas time again, a time to get away with playing with all those old newspapers and other recyclable waste you have been keeping.

Here instead of plastics straws used in the picture, you can make use of twigs to make this nice Christmas decoration.

Reasons for the changes in river health over space and time can be explored based on the land uses and other activities that can be observed on the interactive Google Earth/satellite maps, supplemented by local knowledge. Communities can use the information and knowledge to illustrate the condition of their rivers, and investigate pollution sources. Land users such as farmers or industries can monitor and self-regulate the impact of their activities on the surrounding river environment. The more data the better, as communities and even authorities can look at trends, changes and potential pollution sources and solutions. Pollution hot spot areas will be able to be identified as the miniSASS results provide a “red” flag indicator on river health conditions.



Go to www.minisass.org and register using the Register link in the top right corner (you will receive a confirmation email to activate your account). Once registered (and logged in) you have access to the miniSASS results upload tools on the map page

The website provides the correct methods to do miniSASS as well as hints and tips for getting ready for sampling, river categories and a miniSASS checklist. Updated and improved field sheets are available for download, where you will find the



With all those newspapers and magazines, you can make wonderful Christmas trees to hang on the big tree or to just decorate around the house.

