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The Crystal

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Editors Column

Welcome to our fourth publication for 2014. We are proud to announce that Black Crystal is now a registered consultancy with PICS, more on that in the full article. We have some interesting articles on the demand of the Rhino horn in the world, constructed wetlands and bottled water in Zimbabwe. We would like to congratulate the Business Council for Sustainable Development in Zimbabwe on their APC Corporate Care Award.

We welcome your comments and environmental contributions which you may kindly send to The Editors on:

infor@blackcrystal.co.zw

Thank you and happy reading!

Environmental Consultants
Caring for the environment beyond today

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 to come.

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DID YOU KNOW!!!

Wetlands provide many vital functions such as water purification, flood control, shoreline stability, as well as critical habitat and refuge for a vast array of plants and animals and can also provide food for humans.

Black Crystal is a Registered Consultancy with PICS: contractor prequalification services

Black Crystal are pleased to announce that they are now a registered member of PICS who are one of the fastest-growing contractor management companies in the world, created more than a decade ago with a focus on improving safety. In just a few years, PICS' world-class contractor prequalification service has become an industry leader.

PICS ensures that suppliers are prequalified to work in a safe and sustainable manner. As the global standard in contractor management, PICS has an office in every major part of the world and offers an international solution to contractor prequalification needs in industries such as: Chemical, Construction, Energy, Food and Beverage, Oil and Gas, Mining, Manufacturing, Pulp and Paper and Pharmaceutical.

Black Crystal is streamlining its exposure to potential clients as many use PICS to search for potential vendors where clients look for qualified bidders who are already PICS members in order to assist the process of bringing in a new vendor.

Black Crystal is now qualified for Work with PICS in 76 Countries. PICS have around 1,200 Client Accounts and 85,000 Active Users.

Illegal Trade in Rhino Horn

Recent research conducted by TRAFFIC, (the international wildlife trade monitoring network) has been neatly summarised in a useful reference workbook recently produced for tour guides, teachers and the general public, produced in Australia by Dr Lynn Johnson for the Breaking the Brand project. The research was aimed at getting to the bottom of the illegal trade in rhino horn and correcting some of the misperceptions that are clouding our decisions as to how to combat it. Here are some useful extracts from it: - "Demand for rhino horn began to increase rapidly from 2008. Outlined in this workbook is the background to what is driving the current

rhino poaching crisis. We hope that this gives you the information to help inform tourists and your community about where the majority of the demand is coming from. Only through knowing the real and full picture can we engage people to challenge the current users to stop buying rhino horn. As long as old myths persist, we will struggle to get the necessary behaviour change to secure the survival of rhinos in the wild.

So who are the current users of rhino horn and where do they come from? Historically, China has been a key market for rhino horn. But research by organisations such as TRAFFIC show that the main customers for rhino horn, driving the current poaching crisis, live in Vietnam. Both China and Vietnam have experienced strong economic growth in the last 2 decades and the number of wealthy people is continuously increasing. China experienced continuous and rapid economic growth since around 1993 while Vietnam experienced continuous economic growth, which has accelerated since 2003.

Undoubtedly, some of the rhinos killed in Africa and Asia will go to the Chinese medicine trade and efforts need to continue to bring this to an end. However, this is likely to be a small percentage of the rhinos being poached. We need to consider that even though wealth in China started to grow steeply from 1993, there was no evidence that this affected the rhino poaching numbers, at least in South Africa, for 15 years. So this indicates that the recent spike in demand for rhino horn is not strongly associated with use in traditional Chinese medicine**.** Often people feel that they can't challenge something so old and entrenched as medicinal practices going back many hundreds of years. So it is useful to know that what is driving the current demand is a new fashion in a young population - 70% of people in Vietnam are under the age of 35 years. From a brand breaking and demand reduction perspective it is much better that the spike in rhino horn demand is a new trend/fad – this makes it easier to stop. This is the case for users in Vietnam.

Current measures to save the rhino are underway throughout the protection – supply - demand chain. We would recommend additional focus on changing the purchasing behaviour of the primary users of rhino horn to reduce demand and save rhinos from extinction in the wild. Given this, it is important to know the primary users driving the current poaching levels:

- They live in Vietnam, mainly in the wealthy suburbs of Hanoi and Ho Chi Min City
- They are businessmen and affluent mothers (probably the wives of the businessmen)
- The value of rhino horn is mainly symbolic and a new fashion; it is not entrenched in ancient culture.
- There are only about 20,000 users of genuine rhino
- 90% of all rhino horn sold in Vietnam is fake, e.g. buffalo horn from China. Not being able to distinguish real rhino horn from fake is likely to be helping the rhino's survival
- The users only have 2 motivations to stop: a). Negative impact on their personal status. B) Negative impact on their personal health and health of family and associates
- The users have no or very little empathy with the animal. Campaigns in the form of an appeal to 'protect a species' will, in the main, be ignored by the users of rhino horn.

Importantly, there is no pressure on the users in Vietnam to stop buying rhino horn if China is constantly put forward as the driver of rhino poaching**.** This allows the Vietnamese users of rhino horn to 'fly under the radar'. As a result they receive minimal pressure to change their buying habits. It is very sad that Zimbabwe used to be the country with the world's largest population of black rhino. The numbers of both black and white rhino have

dramatically declined due poaching for a demand in horn. This is despite the fact that rhino horn is made of nothing more than matted hair.

For more information, see http://breakingthebrand.org

Business and Climate Change Workshop

Sharon Waterworth of Black Crystal recently attended the one-day Business and Climate Change Workshop at which Mr Prince Mupazviriho, Permanent Secretary, Ministry of Environment, Water and Climate was the Guest of Honour to officially open the event.

The Workshop was organised by the BCSDZ in appreciated association with the National Climate Change Office in the Ministry of Environment, Water and Climate; Rapid CDM Trust; the United Nations Framework Convention on Climate Change (UNFCCC) Regional Collaboration Centre, Kampala; and with the generous support of UNDP.

Participants at the Workshop with speakers in the front row, from left to right: Mr Evans Matare, SHE Manager, Windmill (Pvt) Ltd, who spoke on Windmill's Greenhouse Gas (GHG) Emissions and Carbon sequestration programme; Mr Washington Zhakata, National Coordinator, SNCCCZ/National Climate Change Office who gave the Keynote Address; Mr Tungamirai Rukuni, Technical Executive, Rapid CDM Trust, who described Clean Development Mechanism opportunities in Zimbabwe and the role of the Rapid CDM Trust; Mrs Daisy Mukarakate, UNDP Zimbabwe Environment Specialist, who spoke on UNDP's Green Office Audit; and Mr Vintura Silva, Team lead, UNFCCC Regional Collaboration Centre, Kampala, who gave a series of presentations on Nationally Appropriate Mitigation Actions (NAMAS), an overall perspective of CDM's and technical support and funding.

The Director of the Development Reality Institute (DRI), Mr Verengai Mabika, also addressed the Workshop on their award-winning Climate Change Virtual School. The BCSDZ and DRI are holding discussions on a partnership arrangement on the new Virtual Climate Change and Business Course. Breakaway Groups at the last BCSDZ Annual Conference rated Climate Change as one of the top two priorities when they reviewed the 9 priority areas listed in the global Action 2020 project that was launched

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BCSDZ wins APC Corporate Care Award

The Advertising and Publicity Club (APC) held a function on World Environment Day at which the BCSDZ was announced as the 2014 winner of the APC's revived Corporate Care Award, and Miracle Missions as the 2014 Runner-Up.

The trophy (pictured above) symbolises the beauty of Zimbabwe's natural resources and the usefulness of recycling. The BCSDZ was praised for its leadership in the business community in gathering and sharing

knowledge to promote environmentally sound practices, while Miracle Missions was lauded for its innovative and on-going waste management programmes.

In thanking the APC for the Award, the BCSDZ Executive Director said it was a reflection of the greatly appreciated and valued continuing support by BCSDZ members and of their voluntary and active participation throughout the BCSDZ structure. He also expressed appreciation for the relationships and collaboration with other stakeholders in the public, private and civil society sectors. Black Crystal (BC) has been a member of the BCSDZ for many years. Senior BC consultants sit on various technical committees.

Constructed Wetlands

It is clear that artificially constructed wetlands perform better than natural systems, (Shutes et al., 1993; Cutbill, 1994; Hares and Ward, 1999)

Black Crystal would like to applaud Mr Tony Lampard of Paramark who is assisting a student that he is mentoring (in Bulawayo) for an advanced study project by constructing a 'pilot' wetland to be used for treating wastewater. An artificial wetland has been built and the student and Mr Lampard are monitoring the flows in and out. The wetland is currently 'maturing' after which it will be tested to see how it cleanses grey water when the quality of the water being discharged will be monitored. Once the design principles have been identified then they can be applied to build a real constructed wetland on a much larger scale.

Constructed Wetland technology is fairly common in other countries around the world for instance in South Africa they are used as treatment for interceptors for: truck washing, fuel station forecourt runoff, kitchen grey water etc. In environmentally sensitive areas, constructed wetlands can be used with onsite systems to improve the quality of the effluent before it is returned to the environment. They can also be used on farms as an inexpensive way to provide extra treatment to animal wastes and by certain industries such as pulp and paper mills. Constructed wetlands are common in mining regions and are used to treat mine drainage.

An example of a constructed wetland

Because constructed wetland systems are designed specifically for wastewater treatment, they typically work more efficiently than natural wetlands. Some constructed wetland system designs can closely resemble natural wetlands enough to provide additional habitat areas for many birds, animals and insects that thrive in wetland environments. Constructed wetlands can treat wastewater from a variety of sources. One of the more common uses is to provide additional or advanced treatment of wastewater from homes, businesses and even communities. Wetlands treat wastewater that has already had most of the solid materials removed from it through some type of primary or secondary treatment.

Of course natural wetlands, marshes, swamps, and bogs play an important role in protecting water quality. Constructed or artificial wetland systems mimic the treatment that occurs in natural wetlands by relying on plants and a combination of naturally occurring biological, chemical and physical processes to remove pollutants from the water. Bacteria's optimum temperature is regarded as 36°C where its generally agreed that the closer one comes to approaching this temperature (provided nutrients, water etc. are adequate) the faster they work.

Homes, businesses, farms, schools and other individual wastewater sources in rural areas sometimes can add a constructed wetland to a septic system or other onsite system to replace or assist a soil absorption field. Some onsite systems can be specifically designed from the start to use a constructed wetland in addition to a soil absorption field on properties with site constraints, such as tight or saturated soils. Wetlands are good at handling intermittent periods of both light and heavy wastewater flows. Therefore, they often work well with wastewater treatment systems that serve hotels, campsites, resorts and recreational areas.

Constructed wetlands have many advantages including:

- Typically inexpensive to build and maintain.
- They require little or no energy to operate.
- They can provide effective tertiary treatment.
- They can provide additional wildlife habitat.
- They can be aesthetically pleasing additions to homes and neighbourhoods.
  They are viewed as an environmentally friendly technology and are generally well received by the public. Things to consider include:
- Constructed wetlands require more land area than many other treatment options.
- Wetlands are not appropriate for treating some wastewater with high concentrations of certain pollutants.
- The performance of wetlands may vary based on usage and climatic conditions.
- There may be a prolonged initial start-up period before vegetation is adequately established.

It is clear that constructed wetlands have a host of advantages and policy makers and Environmental Planners should optimise their use in Zimbabwe. We will be eagerly following the pilot study and will publish the results of the study in following edition of the newsletter.

Drinking water quality assessment in Zimbabwe: A Case Study of bottled drinking water from selected retail outlets in Zimbabwe

Bottled water is any potable water that is manufactured, distributed or offered for sale, which is sealed in food-grade bottles or other containers and intended for human consumption. The sources of water may be springs, dug or tube wells and municipal systems, which are meant to provide water that is fit for human consumption. Consequently, when offered for sale to the consumer, bottled water products should comply with regulatory requirements. Two main types of bottled water recognized are mineral water and spring water, but bottled water can be made from glacial, tap or distilled water. Mineral water is groundwater that has emerged from the ground and flowed over rock. Mineral water is generally perceived as pure and clean. Distilled or de-mineralized water is simply tap water that has undergone processes to lower mineral content and remove chemicals.

Consumption of bottled water is increasing by 10% every year worldwide, with the fastest growth seen in developing countries of Asia and South America. The U.S. consumption of bottled water in 2008 was estimated to be 8.6 billion gallons, or 27.6 gallons per person. The increase in consumption of bottled water in Africa between 1999 and 2000 was 3%. As a result, bottled water has become the fastest growing segment of non-alcoholic beverages, representing a market worth US$22 billion. Consumption of bottled water is an alternative when no safe water is available. Nowadays, bottled water is being used in many places due to its availability, low cost and taste. Water is essential for sustaining human life and it is one of the sources of trace metals, anions and microbial contaminants that enter the human body.

Thus, its quality considerably affects the health of consumers. Trace elements such as cobalt, copper, iron, manganese, molybdenum, selenium and zinc can be classified as essential elements for human life while other elements such as heavy metals for example, silver, mercury, aluminum, arsenic, cadmium, chromium, lead and nickel are potentially toxic. Many elements are essential at low concentrations, but toxic when they exceed recommended levels**.** Epidemiological studies in recent years have indicated that there are relations between content of trace elements in drinking water with some kidney and heart disorders and different types of cancer. For example, cadmium is a known carcinogen, and has a life time of thirty years in bones. Lead is a neurotoxin responsible for many toxic effects in the human body.

Tap water and bottled water have the same risk of chemical and microbiological contamination. Chemical contamination of bottled water may arise from contaminated water or material making the bottles. Toxic metals may be released from poly ethylene terephthalate (PET) into the water. Water bottles are often kept under room temperature conditions where there is risk of leakage of metals from bottle wall into the stored water. It is therefore important to have specially designed food grade bottles for packaging and storage of the water.

Bottled water may be contaminated by microorganisms such as *Pseudomonas*, *Aeromonas*, *Flavobacterium*, *Pasteurella*, *Xanthomonas*, and *Staphylococcus*.The proliferation of microbes in bottled water may be influenced by the type of packaging. Higher bacterial counts have been found in waters stored in plastic or PVC bottles when compared with glass. The reason suggested for the higher counts was that the inner surface of plastic bottles was rougher, so promoting adhesion of microorganisms to the walls of the container. Results of microbiological examination of bottled water are important for bottled water manufacturers who need to put in place measures to prevent contamination of the water. The findings are also useful to policy makers, regulatory authorities and consumers. The consumption of bottled water in Zimbabwe increased from the year 2008 to date as a result of inadequate supplies of treated municipal tap water. The upsurge in consumption of bottled water was prompted by pollution of water sources by wastes from mine dumps. These developments created a market opportunity for numerous bottled water suppliers who gave the impression that the product is clean and safe for human consumption.

The influxes of many unregistered brands of bottled water pose a threat to the health of consumers. Unless Good Manufacturing Practices are put in place by water bottling companies, the water is liable to contamination by chemicals and microorganisms. Reports in the media have pointed out public concern about the quality of bottled water sold in markets of Harare. It has been reported that some of the water bottling companies were unlicensed and their activities were investigated by the Ministry of Health and Child Welfare. It is against this background that the research sought to assess the quality of bottled drinking water sold in Harare's retail outlets and to determine if the concentrations of selected chemical and microbiological parameters were within the WHO Guidelines for Drinking Water Quality and Zimbabwe Food and Food Standards (Mineral and Bottled Water) Regulations. The levels of total dissolved solids, nitrates, chlorides, sulphates, sodium, potassium, magnesium and calcium of the samples were below the maximum set limits 2. Five brands of water were contaminated by nitrites, lead and chromium. *E. coli* was not detected in all the brands, although two brands had Total Viable Counts that exceeded recommended limits. The results revealed that the water brands analyzed failed to comply with the WHO Guidelines for Drinking Water Quality, suggesting that they may not be safe for consumption. Be a careful consumer and only buy bottled water that has been certified by the Zimbabwe Standards Association.

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Thank you!!!