

### Editors Column

It's the end of the first half of the year, how time flies!!! In this edition we look at the shocking and upsetting news of how giraffes are headed towards extinction, we also look at an article about the Kariba Dam project. Congratulations to Shingirirai Trust on getting funding from the Netherlands embassy to undertake a glass recycling project that includes the empowerment of women in the high density areas of Mabvuku, Tafara and Caledonia. Lastly, we look at the World Environment Day celebrations for this year.

We welcome your comments and environmental contributions to the Editor:

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Thank you and happy reading!



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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.

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### What's Happening To All Our Giraffes? The Disappearing Species Faces Silent Extinction

In what perhaps may be the most shocking upset in recent news, Ecologists revealed in December 2014 that giraffes may be headed towards extinction - and it's in part due to a lack of awareness of dangers facing the African species. While contemporary studies in Africa's central savannahs have revealed that the collective impacts of human encroachment, habitat loss and black market poaching are threatening wildlife communities, researchers say that giraffes are amongst some of the hardest hit populations. Thus making the long list of traded black market species of African wildlife even longer. Without a significant change in the way giraffes are protected, they may disappear altogether within a matter years.



According to the Giraffe Conservation Foundation, which made the announcement, latest research figures revealed that African populations of giraffes have dropped nearly 40% in the wild over the course of only 15 years. The organization's director, Dr. Julian Fennessy says that the figures bring to light "a silent extinction", pointing out that numbers have fallen from 140,000 to only 80,000, and numbers are continuing to decrease. Though large, the gentle giants are relatively easy for hunters and poachers to kill for meat and hides that bring in a premium amount of money on Africa's and Asia's black markets. Their skins are sold throughout the continents for clothing items and as fabric for interior designs, while their meats have become quite a delicacy in certain regions, fetching quite a high demand. In fact, in nations such as Tanzania, locals

have come to believe that eating parts of the animal can cure HIV and AIDS, (this is of course completely untrue) bringing giraffes to the top of the black market lists.

So, why is this the first time we're hearing about the plight of the giraffe's if their numbers have been falling significantly since the end of the 20<sup>th</sup> century? Experts believe that it's because of the species' presence in lots of mainstream media, that people are perceiving the giraffes to be far more abundant than actual figures reveal. "Giraffes are everywhere. Look at kid's books, which are full of giraffes" research coordinator for San Diego Zoo's Institute for Conservation Research, David O'Connor says. "They're always in zoo collections too. They're easily visible, so you don't think that we have to worry about them." But that's far from the truth! Groups such as the Giraffe Conservation Foundation are hopeful that by bringing to light the struggles that face giraffe populations in upcoming years, without the change necessary to sustain the species, that stricter conservation measures may soon take effect. And to better help serve the species, the researchers are not only bringing to light the data that faces all giraffes in Africa's savannahs, but are also raising awareness of the nine subspecies that exist in the wild, in hopes of keeping the giant species from being lost to history in our near future.

Source:

<http://www.sciencetimes.com/articles/1775/20141208/what-s-happening-to-all-our-giraffes-the-disappearing-species-faces-silent-extinction.htm>

### Hwange National Park Charcoal Theft



Ranger B Mbewe at one of the snares located

A very disturbing charcoal making operation was recently found in Hwange National Park. A National Parks ranger said that all the equipment was confiscated in the hope that it will be difficult for the culprits to acquire more. One culprit who was caught revealed that they were making about USD500.00 from each heap of charcoal and that their main market is chicken growers in Bulawayo who use the charcoal to keep chickens warm.



One of the four heaps found

He also mentioned that they are not the only ones in the area and that is a booming operation. We hope that something is being done about this as its causing huge destruction of the environment.

Source: Benjane Trust Newsletter – February 2015

### The rescuing of the Kariba Dam

Engineers have started on a R3.3bn rescue marathon to prevent the "catastrophic failure" of the Kariba Dam. According to a World Bank special report on the beleaguered structure — one of the biggest man-made dams in the world — a potential wall collapse threatens the lives of about 3 million people living on the Zambezi River floodplain between the hydro scheme on the Zambia-Zimbabwe border and the Mozambique coast. The document, titled 'The Kariba Dam Rehabilitation Project', estimates that in the event of a "catastrophic Kariba Dam failure", economic damage to the region will exceed R88bn and will include the washing away of the Cabora Bassa Dam and the loss of 40% of southern Africa's electricity capacity. Although the danger was spotted a decade ago, the perilous condition of the wall only filtered out recently.

The World Bank, the watchdog Zambezi River Authority (ZRA) and engineers are united in their opinion that, without urgent repairs, the dam wall might collapse.



Kariba's dam wall is under attack on two fronts. Spillway torrents have excavated a massive cavern in the Zambezi River bed that threatens the stability of the wall foundations, and a slow chemical reaction is causing concrete swelling, affecting the operation of the spillway gates and their effectiveness in handling high water levels. In recent announcements, officials in Zimbabwe and Zambia have been at pains to reassure the public that, while the situation is serious, it presents no immediate danger. A rehabilitation programme has been drawn up by local and international engineers and funding has been raised. The short timeline for the repairs is the real peril, and the scope of the work to be done is daunting and will test the skills of some of the best engineering experts assembled for the task. A company called Tractebel Engineering now advises the ZRA on matters pertaining to safety, maintenance and satisfactory operation of the dam. It includes engineering studies and works supervision of the spillway rehabilitation, construction of an emergency gate, and sustainability of the plunge pool."

ZRA Communications Manager, Elizabeth Karonga, says there is an urgent need for major rehabilitation of the dam. She insists, however, that while the situation is "cause for grave concern, the engineers on the ground have the situation under control. All urgency is expected in order to avert any such catastrophe as dam failure." "Major

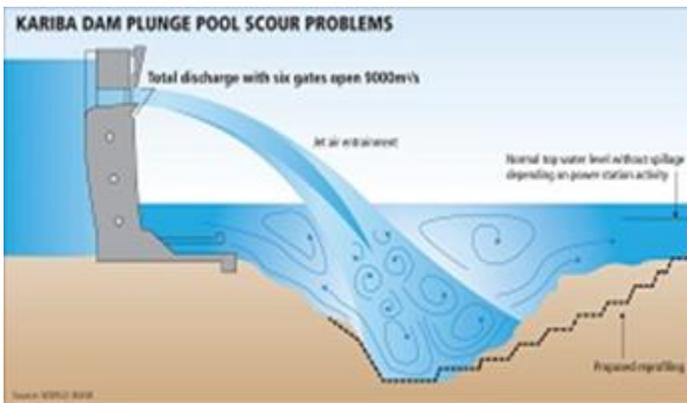
funding agencies were quick off the mark with the European Development Bank providing \$100m, the World Bank \$75m, the Swedish government \$47m and the African Development Bank \$75m for a \$295m emergency package after a team was sent to inspect the dam.

The immediate focus is a relatively thin strip of concrete restraining the 250km-long lake holding 185-billion tonnes of water. According to George Sitali, Vice-president for Policy, Public Relations and National Development at the Engineering Institute of Zambia, there is no danger of the imminent collapse of the dam. However, he urges a speedy solution, noting his institute's finding that the plunge pool's scouring could lead to undermining the dam's foundation and to instability of the wall.

"Among the significant external activities likely to cause concern on the integrity of the dam are the drill and blast operations at the Kariba south bank," says Mr Sitali. "Such activity causes vibrations and shock waves which must be capped at certain thresholds. It is therefore recommended that all drill and blast operations taking place at and near the dam are monitored, logged, analysed and controlled according to the recommendations of Kariba Dam." Engineers from Zambia, Zimbabwe and other countries have drawn up a plan of action on how best the threats to the dam wall can be confronted. They identify the major problems as the cavern being excavated in the riverbed by floodgate water, causing a weakening of the dam wall foundations; and the jammed spillway gates stunted by concrete swelling. New sluice-gate stop beams will be installed.

The excavation in the plunge pool next to the wall is now 10 times bigger and deeper than its design dimensions and will have to be remodelled by blasting before it is lined to better cope with the turbulence of water discharged at 8,000 tonnes a second at times. Curiously, the yawning cavern below the dam wall will be enlarged as a means of dealing with the threat. Alan Bates, a UK-based hydroelectric scheme specialist with wide experience in African conditions and a frequent visitor to Kariba, says although he has no knowledge of the dam's current

predicament, the plan to rescue it makes sense in terms of general practice. "The plunge pool will be made larger deliberately as this will allow the turbulence resulting from the spillway discharge to be dissipated in a less damaging way," he says. "Think of it as sitting in your bath and splashing — you get water all over the floor and walls. If you did the same in a large swimming pool you would dissipate the same energy but without all the damage."



It has always been known, Mr Bates says, that a plunge pool would develop downstream of the dam but the very narrow hole that has resulted over the years is concentrating the dissipation of energy, leading to erosion in undesirable directions (such as towards the dam). "By excavating a much larger plunge pool in the downstream direction, the erosive power of the turbulence is reduced and unplanned erosion should be minimised or even eliminated," Mr Bates says. "It is normal design practice these days to excavate the plunge pool as part of the dam construction contract in order to prevent this sort of problem occurring. "Both Kiambere and Masinga dams in Kenya, on which I have worked, had plunge pools downstream of the spillway excavated in advance and included a sloped downstream face to the plunge pool excavation."

Filling up the plunge pool with concrete is not an option, he maintains, "Because this would only mean the spillway would wash out all the concrete the first time it operated. Concrete is weaker than granite and the hole would soon reappear". Kariba's floodgates are designed to release the magnitude of floodwater that occurs once in 10,000 years. "So if one gate is out of action for repair and the spillway capacity reduced, it is most unlikely to result in

any problem. "Even with one gate out of action the spillway capacity would probably still be enough to pass the flood event that only occurs once in 1,000 years. So the risk is very small," Mr Bates says. It is also possible to modify the spillway gate operation rules to hold the reservoir level down in advance of a flood, but this is most unlikely to be necessary. Floods on the Zambezi take some time to build up, so there will be advance warning from rainfall monitoring in the upper catchment, allowing for time to respond.

The World Bank largely concurs. "The objective is to stabilise the plunge pool and prevent further scouring, particularly along the weak fault/seam zone towards the dam foundations," its report notes. "A 3D model was used to assess how the plunge pool scouring progress and excavation would affect the stress field of the dam foundation." The reshaping of the plunge pool calls for the construction of a cofferdam. This will enable the blasting and excavation of 300,000m<sup>3</sup> of rock from the downstream face and north and south bank sides of the pool in the dry season. The result will be a stepped profile that will improve energy dissipation and guide the spilling water downstream, away from the foundations. The World Bank assessment cautions, however, that the scouring is only controllable if no more than three, nonadjacent gates are opened. This will limit the spillway discharge capacity during large floods and means lowering the maximum safe reservoir level, which in turn would reduce the dam's power generation capacity. A set of new stop beams with an emergency opening and closing roller gate will be installed. A specialist in wet engineering says the project will take several years to complete "partly because only one gate can be worked on at a time, but also because the plunge pool excavation work cannot be done if the lake level is high and the dam is spilling".

The work on the plunge pool excavation can start only in April or May 2015, after the rainy season, beginning with the construction of the cofferdam. "When the cofferdam is in place, it will be necessary to pump out some of the water between the dam and the cofferdam and then gradually work downwards, with the plunge pool

excavation reducing the water level as work proceeds," a British wet engineer explains. "A floating pump station on a barge will pump water out of the pond area and discharge it downstream. The blasting operation will take place as the water level drops." Peter Mason, wet engineering technical director for US-based MWH international dams and hydropower, believes Kariba's wall structure "is still essentially sound, particularly as Kariba is an arch dam". There is not much that can be done to treat the problem of concrete swelling. "We just have to understand what future expansion to expect." Kariba's real race is against that great enemy — time. The consensus of engineers from around the world is that Kariba has a life span of three years if extensive repairs are not undertaken immediately. Southern Africa and the world must sit up, listen and take action in both reconstruction and finding, in all probability, a lot more funding than the R3bn already at hand. Even with one gate out of action the spillway capacity would probably still be enough to pass the flood event that only occurs once in 1,000 years. So the risk is very small.

### International Conflict Tops List of Global Risks in 2015

London, United Kingdom, 15 January 2015 – The biggest threat to the stability of the world in the next 10 years comes from the risk of international conflict, according to the 10th edition of the Global Risks report. The report, which every year features an assessment by experts on the top global risks in terms of likelihood and potential impact over the coming 10 years, finds interstate conflict with regional consequences as the number one global risk in terms of likelihood, and the fourth most serious risk in terms of impact. In terms of likelihood, as a risk it exceeds **extreme weather events** (2), failure of national governance systems (3), state collapse or crisis (4) and high structural unemployment or underemployment (5). In looking at global risks in terms of their potential impact, the nearly 900 experts that took part in the Global Risk Perception Survey rated **water crises** as the greatest risk facing the world. Other top risks alongside interstate conflict in terms of impact are as follows: rapid and massive spread of infectious diseases (2), weapons of

mass destruction (3) and **failure of climate change adaptation** (5).

The 28 global risks that were assessed were grouped into five categories – economic, **environmental**, geopolitical, societal and technological – 2015 stands out as a year when geopolitical risks, having been largely absent from the landscape of leading risks for the past half-decade, returns to the fore. With geopolitics increasingly influencing the global economy, these risks account for three of the five most likely, and two of the most potentially impactful, risks in 2015. Also in this category, three risks stand out as having intensified the most since 2014 in terms of likelihood and impact. These are interstate conflict with regional consequences, weapons of mass destruction and terrorist attacks. The risk landscape in 2015 also shows that there remains concern over the world's ability to solve its most pressing societal issues, as societies are under threat from economic, **environmental** and geopolitical risks. Indeed, the societal risk accounts for the top two potentially impactful risks.

Also noteworthy is the presence of more **environmental risks** among the top risks than economic ones. This comes as a result of a marked increase in experts' negative assessment of existing preparations to cope with challenges such as **extreme weather and climate change**, rather than owing to a diminution of fears over chronic economic risks such as unemployment and underemployment or fiscal crises, which have remained relatively stable from 2014. "Twenty-five years after the fall of the Berlin Wall, the world again faces the risk of major conflict between states," said Margareta Drzeniek-Hanouz, Lead Economist, World Economic Forum. "However, today the means to wage such conflict, whether through cyberattack, competition for resources or sanctions and other economic tools, is broader than ever. Addressing all these possible triggers and seeking to return the world to a path of partnership, rather than competition, should be a priority for leaders as we enter 2015."

In addition to assessing the likelihood and potential impact of these 28 global risks, Global Risks 2015 examines the interconnections between risks, as well as how they interplay with trends shaping the short- to medium-term risk landscape. It also offers analysis of three specific cases which emerge from the interconnections maps: the interplay between geopolitics and economics, the risks related to rapid and unplanned urbanization in developing countries and one on emerging technologies.

#### Top 5 Global Risks in Terms of Likelihood

1. Interstate conflict with regional consequences (geopolitical risk)
2. **Extreme weather events (environmental risk)**
3. Failure of national governance (geopolitical risk)
4. State collapse or crisis (geopolitical risk)
5. High structural unemployment or underemployment (economic risk)

#### Top 5 Global Risks in Terms of Impact

1. **Water crises (societal risk)**
2. Rapid and massive spread of infectious diseases (societal risk)
3. Weapons of mass destruction (geopolitical risk)
4. Interstate conflict with regional consequences (geopolitical risk)
5. **Failure of climate-change adaptation (environmental risk)**

On urbanization, the report considers how best to build sufficient resilience to mitigate the challenges associated with managing the world's rapid and historical transition from predominantly rural to urban living. "Without doubt, urbanization has increased social well-being. But when cities develop too rapidly, their vulnerability increases: pandemics; breakdowns of or attacks on power, water or transport systems; and the effects of climate change are all major threats," said Axel P. Lehmann, Chief Risk Officer at Zurich Insurance Group. The rapid pace of innovation in emerging technologies, from synthetic biology to artificial intelligence, also has far-reaching societal, economic and ethical implications. Developing regulatory environments that are adaptive enough to

safeguard their rapid development and allow their benefits to be reaped, while preventing their misuse and any unforeseen negative consequences is a critical challenge for leaders. John Drzik, President of Global Risk and Specialties at Marsh, said: "Innovation is critical to global prosperity, but also creates new risks. We must anticipate the issues that will arise from emerging technologies, and develop the safeguards and governance to prevent avoidable disasters." The report also provides analysis related to global risks for which respondents feel their own region is least prepared, as well as on the global risks on which they feel most progress has been made over the last 10 years. It also presents for the first time country-level data on how businesses perceive global risks in their countries, which can be accessed here. Moreover, the report features three examples of risk management and resilience practices related to extreme weather events. The Global Risks 2015 report has been developed with the support of Strategic Partners Marsh & McLennan Companies and Zurich Insurance Group. The report also benefited from the collaboration of its academic advisers: the Oxford Martin School (University of Oxford), the National University of Singapore, the Wharton Risk Management and Decision Processes Center (University of Pennsylvania), and the Advisory Board of the Global Risks 2015 report.

weforum.org

#### World Environment Day 2015

World Environment Day (WED) is celebrated every year on 5 June to raise global awareness to take positive environmental action to protect nature and the planet Earth. It is run by the United Nations Environment Programme (UNEP). It was established by the United Nations General Assembly in 1972. Media and celebrities have encouraged WED Celebrations by endorsing and taking part in it. For the WED, UNEP goodwill ambassadors including supermodel Gisele Bündchen were sending an SOS to the world to take action for World Environment Day 201 by joining one of their teams to combat climate change. Their call to action, 'Message in the Bottle', asked individuals around the world to join one of the celebrities teams and make a difference by pledging

to take action in support of World Environment Day globally on 5 June.



The theme for 2015 is 'Seven Billion Dreams; One Planet; Consume with Care', while the theme for 2016 is "Join the race to make world a better place".



glass ranging from wine, beer, brandy, whisky and other wide range of glasses being transformed from waste to household products that can be used in the day to day running of a household.



The transformation processes include slumping, sandblasting, cutting and polishing of these bottles. These products include but are not limited to water glasses, brandy glasses, cheese boards, and vases.



### Congratulations to Shingirirai Trust

The Black Crystal team would like to congratulate Shingirirai Trust on their awarding of project funding for a glass recycling project. With the help of Black Crystal Consulting, Shingirirai Trust managed to come up with a proposal that saw them being awarded funding from the Embassy of Netherlands. The project is aimed at improving the livelihoods of mothers in the communities of Mabvuku, Tafara and Caledonia by creating jobs for at least 15 mothers from the ages of 18 to 45 who are the household heads and breadwinners. The Project Manager for the glass recycling project is Mrs Jacque Marewa Jaure who will be assisted with a team of professionals which includes Mr George Nachamba, to develop the idea on a business and technical basis. The project will see

Some of the recycled products to be produced. Top picture shows slumping while bottom picture shows sandblasting