



APPLIED SCIENCE FOR SUSTAINABLE DEVELOPMENT



CLIMATE CHANGE RISKS AND IMPACT COSTS: SOUTH AFRICAN BREWERIES LTD

NHLANHLA PHAKATHI

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INTRODUCTION

Climate change is a natural cycle where the earth and its atmosphere accommodate the change in the amount of energy received from the sun. The process goes through phases of warm and cold periods taking centuries to complete a cycle. The change in temperature influences rainfall, amongst other things, which may lead to natural events like droughts or in contrast floods. The biosphere is adapted to these changes if they take centuries to occur. The problem lies with human intervention where the process of climate change has been accelerated putting ecosystems in danger due to the fact that plants and animals cannot adapt as fast. It is predicted that the air temperature in south Africa will increase by an estimated 2°C over the next century (South African Weather services 2018).

The Greenhouse effect is essential for life on earth as the rays trapped are used to heat the planet. The problem arises when there are too much gases caused by the burning of fossil fuels (oil coal, natural gas) and the clearing of forests (South African Weather services 2018). An estimated 18 million acres/7.3 million hectares of forest (roughly the size of Panama) are lost each year according to the United Nations' Food and Agriculture Organisation(FOA) (Bradford 2018: para 1).

South African Breweries(SAB) is part of the AB-inbev family, founded in 1895 and is now the top brewer and leading distributor of beer in South Africa. It operates seven breweries and forty depots and has an annual brewing capacity of 3.1 billion litres. They work with farmers across South Africa to grow their crops with use of smart agricultural practices. They also create a lot of job opportunities and are big in corporate social responsibility. Beer is made mainly of water, malt/barley, hops and yeast, so therefore climate change affects beer production directly (South African Breweries. 2018).

CLIMATE CHANGE RISKS AND IMPACT ON BUSINESS

Beer production for large breweries amounts to over 6,000,000 barrels (704,087 m³) per annum, medium is between 15,000 to 6,000,000 barrels and small is less than 15,000 barrels (17,602 m³) per annum. In the brewing industry water is used for beer production and also for cleaning, sanitation, heating and cooling processes. The brewing processes which consume most water are: floor cleaning, milling,



mashing, separation, flushing of filter, vacuum pump for filter, keg washing, boiling, cooling, fermentation with yeast, maturation and pasteurisation, and cleaning of packaging materials (bottle washing). The main brewing intensive water use stages are: Milling, Filtration,

Pasteurisation, Packaging and Cleaning (Ramukhwatho et al. 2016)

“We believe it is common sense to seek a world that is cleaner and more environmentally friendly to create an atmosphere and economy that are conducive to doing business. To do this, we have integrated sustainability into our business strategy, and have accountability monitoring and benchmarks in place throughout our business,” says David Hauxwell, Vice President Sustainability and Procurement, SAB and AB InBev Africa (South African Breweries. 2018).

SAB owns a hop production company, The South African Breweries Hop Farms (Pty) Ltd; a barley farming company, The South African Breweries Barley Farms (Pty) Ltd; a barley malting company, The South African Breweries Maltings (Pty) Ltd (South African Breweries. 2018).

Changes in surface and air temperature:

Temperature is a vital factor that affects the rate of plant development. Warmer temperatures and potential for extreme temperatures will affect plant productivity. Pollination is one of the most sensitive stages to extreme temperature changes which greatly affects productivity (Hatfield et al. 2015:4-10). This would greatly affect the production of the much needed ingredients of malt/barley, hops as well as the production of the yeast. This loss will put a strain on beer production as suppliers would struggle to meet the demands. The costs will be greater with the need to import the needed ingredients from other countries.

The future of South Africa's hops industry is in serious trouble. The country's 13 commercial hop farms have once faced decreased rainfall and an uncertain future. Without its golden produce – grown on the slopes of the Outeniqua Mountains outside George in the southern Cape – the bitter smack would have been lost from the nation's beer. The local variant of hops is already adapted to the local climate. It survives off 700mm rainfall a year, compared with the 1 000mm it traditionally requires. This adaptation came in the 1980s, when the apartheid government declared the crop of "strategic importance" and pushed for 100% local production. The WWF's Christine Colvin – one of the researchers – says rapid changes in climate will favour alien species, as local plants cannot adapt fast enough. Uncontrolled, aliens will suck up 40% of the annual run-off in the catchments used by hop farmers. This will add R5.4-million to costs, as farmers will have to turn to groundwater for irrigation, she says. To prevent this, the research said R39-million was needed over a 10-year period to remove the alien trees (Kings 2015 para 1).

Heat waves may cause heat stress for SAB's employees. Heat stress is a condition wherein the human body is unable to maintain a healthy temperature. It affects both the productivity of the workers – which translate to overall productivity – and safety in the workplace. Heat stress causes the body to lose water and electrolytes faster. This in turn causes loss of focus and physical performance. In fact, according to studies, mental performance degrades well in advance when a person is working in a hot environment. This is followed by poor motor control functions which will disable the person's ability to work efficiently. Thus, when most personnel in a workplace suffer heat stress, lower productivity will be the result (thortz 2018).

Heat stress impacts workplace safety directly and indirectly. If workers are experiencing heat strain in long periods of time and repeatedly, they are likely to suffer from heat related illnesses. They will be directly affected with various conditions that can range from simple rashes to fatal heat strokes. Additionally, as heat stress affects mental performance and motor skills, workers will not be able to focus properly on their jobs. This commonly becomes an indirect cause of accidents in the workplace. (thortz 2018)

An abstract of an article dated 2018-08-08 reads "Johannesburg - It is probably the first time ever that snow has fallen in all nine of South Africa's provinces on the same day. Kenosi Machepe from the SA Weather Service said this when referring to the vast cold front that brought snow to Pretoria for the first time since the late 1960s, reported Beeld. In the Western Cape, snow fell on mountains in the Boland as well as in towns like Richmond and Touws River while snow was lying thick on the Matroosberg in Ceres. In Johannesburg, snow was lying up to 20cm deep in some areas while Golden Gate in the Free State

got the most snow in six years. In Bethlehem, snow was up to 70cm deep and schools were closed due to the weather. There was also snow in Mpumalanga and Limpopo while light snow fell in the North West. The weather office said the cold would continue for another day or two.” (Beeld 2012:1)

Changes in precipitation:

Water availability is a critical factor in crop production. Although a drought tolerant trait in plants may be introduced, if water is not available in the soil then the yield will be affected (Koo 2010:1). South Africa was recently hit with a drought that affected most of the country resulting in a national state of disaster declared on 13 march 2018. (phys.org 2018)

Solution: my suggestion would be in the investment of Greenhouse farms that could essentially be used to regulate the temperature that the crop would be in coupled with good irrigation systems this would provide an almost guaranteed yield, therefore productivity will be maintained. Research into resistant crop could also be a possibility because it would save money due to the costs it would take for infrastructure for the greenhouse farms but research is also expensive. Water reservoirs which can collect rain water, when available, could supply the greenhouse farms and would supplement normal pipeline water supply.

Delays to supply may lead to loss of reputation and productivity loss for the company as a whole.

Heat stress might be minimised by the use of proper ventilation as well as use of air cooling systems. Proper education is needed for the employees so that they may quickly identify the things that cause this heat stress and take precautionary measures against them.

Effects on SAB transport and third party transporters and infrastructure:

According to Loos (2013: para 2 line 1) higher ambient temperatures during a heat wave can stress batteries and electrical and cooling systems to the breaking point, which affects such a big company as SAB which has forty depots that have to distribute the products throughout the country. This directly impacts SAB as an increase in transport costs would lead to a decrease in the profit margins.

A solution to the transport issue would be a stipulation by SAB that would make it mandatory to outsourced transport companies to try and avoid unnecessary breakdowns by flushing the antifreeze,

checking its ph level, and checking radiator hoses and belts as well as changing the oil and checking the air filters (Loos 2013).

This contraction and strengthening of the winds is very similar to what we are already seeing today as a result of human caused climate change (phys.org 2018). High wind speeds or gust wind extremes from non-tornadic storms are among the most destructive natural hazards over the world that cause considerable economic and social costs, as well as damage to properties, infrastructure, agriculture, power lines, and trees. The damage to structures can increase significantly when wind gusts exceed a certain collective wind pressure design or “breaking point.” Under global warming, the severity and frequency of future wind gust events could be expected to change late this century. (journals)

Due to the above winds can cause lots of damage to the breweries properties that could amount to lots of damage recovery costs as well as insurance premiums hiking due to greater risk of damage or loss to



be encountered. There have also been instances where trucks have overturned due to large gusts of winds ,because of the windage surfaces of the trucks being great.

An extract from iol dated 22 July 2015 reads “Cape Town - Gale-force winds

tore through July the Western Cape on Tuesday night and Wednesday morning, uprooting trees, flipping over trucks and leaving key routes barred to commuters.

Provincial traffic chief Kenny Africa said it was difficult to tell if the wind, which had reached speeds of over 50km/h, would die down later on Wednesday. “It all started last night and ever since then the wind has just kept getting stronger.”

Traffic services had to jump into action on Tuesday afternoon when the gusts first picked up. Four trucks travelling over the bridge just before the Huguenot Tunnel were whipped by the winds and eventually flipped on to their sides.” (Legg.Kruger 2015).

CONCLUSION

Climate change is a natural process and with the influence of humans it can be sped up to detrimental effects. The burning of fossil fuels coupled with the huge issue of deforestation leads to adverse changes in the climate, that affecting weather conditions that most biomes would need centuries to adapt to. It takes centuries for each cycle to take place. Droughts, floods, severe storms, excessive build-up of greenhouse gases in the atmosphere are detrimental to the manufacturing and distribution of SAB's alcoholic beverages. Vital ingredients to the breweries products could suffer to adapt to the changing circumstances and either lose their properties, affecting taste, or cease to exist. This would leave a great financial hole in the company resulting in thousands of people losing their jobs, farmers losing their customers because it would close the local market as the need to import the ingredients would be the only way to sustain the company.

Adverse effects of climate change affect not only the manufacturing of SABs beverages but also affects the delivery as well as the productivity of employees due to factors mentioned earlier such as heat stress, which then directly affects productivity. The company could not only lose out financially but its reputation could be tarnished by the inability to meet demand and delays caused by factors beyond anyone's control.

The only interventions would be to make precautionary measures such as investment in infrastructure like the greenhouse farms that are mentioned, the education of employees in terms of working methods and identification of situations that would put them in exposure of dangerous working conditions. Introduction of by-product cleaning facilities that would minimise the amount of waste produced e.g. Waste water, gas emissions from burning etc., could in the overall help to reduce the rate at which climate change is taking place. Although a single factory might not change the world's climate, a company like South African Breweries could make a huge impact.

Other interventions could be to place restrictions on third party or company owned transport providers to ensure that precautionary measures are taken before being put in a situation where breakdowns and non-delivery or delay to delivery might happen.

It is in everyone's best interest to reduce the impact they have on the environment because it forms a domino effect, affecting each industry and each individual.

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