

# CLIMATE CHANGE PHENOMENON ON WOOLWORTHS N Khumalo

## Intro

Climate change is an issue requiring urgent action on the part of governments, business and citizens in order to avert the risk of serious damage to global prosperity and security. Woolworths is one of the companies which is thoroughly affected by climate change since it deals with clothing which is derived or manufactured from plant species entirely dependent on climate change. Climate change has different causes and impacts, and fortunately there are constructive measures that can be taken to counteract or reduce factors contributing to climate change.

## Causes/SPECIFIC RISKS

Prior to the discussion of the impacts of climate change on Woolworths, it is consequent to first discuss the causes of climate change. Climate change is primarily caused by global warming. In the article, Climate change primer (2016: para. 17 line 1) global warming is caused by gases released primarily by the burning of fossil fuels and the tiny particles produced by incomplete burning trap the sun's energy in the atmosphere. Scientists call these gases "greenhouse gases" (GHGs) because they act like the wrong way reflective glass in our global greenhouse.

## Influence of humans

Humans have been influencing the climate since the start of the Industrial Revolution. Since then, the average world temperature has risen by approximately 0.8 degrees Celsius. In North-West Europe (including the Netherlands) the average temperature has risen by 1.5 degrees. The sea level has risen by around twenty centimetres and most of the glaciers have shrunk dramatically.

## CO<sub>2</sub> and climate change

The most well-known and the most important greenhouse gas is CO<sub>2</sub>. The concentration of CO<sub>2</sub> in the atmosphere is subject to variation even without human intervention. The carbon cycle causes an exchange of CO<sub>2</sub> between the biosphere and the oceans on the one hand and the atmosphere on the other

## Aerosols

Aerosols are less well-known than greenhouse gases. Aerosols are dust particles which, in addition to CO<sub>2</sub>, are released into the atmosphere in large quantities when wood and fossil fuels are burned. Some aerosols have a cooling effect on the climate, others have a warming effect. On balance they have a cooling rather than a warming effect, but no-one can give a clear idea of the magnitude, because we still do not understand how aerosols influence the occurrence and characteristics of clouds.

Natural phenomena, greenhouse gases and aerosols create an imbalance in the incoming and outgoing radiation in the atmosphere. This process is known as radioactive forcing. When the Earth heats up, the short-wave radiation from the sun that enters the atmosphere is greater than the long-wave radiation that exits the atmosphere. The temperature changes on Earth will not stop until the

radiation balance is restored. Given the immense capacity of oceans to absorb heat, it will take a long time to strike a new balance.

## **Impacts**

### **Climate change and diminishing food security**

Rising temperatures are affecting our climate and as a result, it affects our environment and the functions it delivers. One such key function is nutrient replenishment. Climate change puts nutrient cycles at risk, which has a knock-on effect on soil fertility required to make plantations. Such effect is critical for Woolworths as there is a decline in crop yields, which are the components of products traded by Woolworths. More specifically, as soils become dryer with climate change, this impacts nitrogen and carbon concentrations which are the building blocks for plant growth.

### **Climate change and problems with water quality**

Climate change is having serious impacts on the world's water systems through flooding, droughts, as well as more extreme rainfall patterns. This creates further pressures on rivers and lakes that supply water for Woolworth factories when they manufacture products. What is more, the world's oceans are also put at risk. Oceans are considered carbon sinks because they absorb huge amounts of carbon dioxide, limiting its potential to contribute to further global warming.

### **Climate change impact on air quality.**

According to a recent study, by the end of the century, more than half of the world's population will be exposed to increasingly stagnant atmospheric conditions, with the tropics and subtropics bearing the brunt of the poor air quality.

Air stagnation results from three meteorological incidents: light winds, a stable lower atmosphere and a day with little or no precipitation to wash away pollution. If greenhouse gases were to rise significantly in the future, estimates indicate that 55% of the global population will experience more air stagnation by 2099.

An Ohio State University (2016: para. 2 line 4) study predicts that the ice on top of Kilimanjaro could be gone sometime between 2015 and 2020. And that's not the only climate change effects. The warmer, dryer climate at the summit has led to an increase in forest fires on the slopes, resulting in a downward shift of the upper forest line.

### **Climate change effects on Woolworths as a fashion brand.**

When consumers are walking across the mall parking lots ... without coats and sometimes in shorts and short sleeves, browsing for winter apparel is just not top of mind. Unseasonably warm weather typically leads shoppers to postpone – or forego entirely – purchases of winter clothing. This means stores will be stuck with unwanted merchandise they could end up selling at clearance prices in January, adding to pressure on profit margins at a time when big chains are spending a ton on e-commerce to compete with Amazon.com.

And brands' and retailers' problems do not halt there; climate change is proving a double blow to manufacturers who trade in natural fabrics – such as cotton (as of November 2016, cotton was

priced at roughly \$70 per pound, up from \$60 a pound a year prior) – as different weather patterns are changing what people choose to wear.

Crop yield trends are becoming insufficient to provide enough material to manufacture clothing.

Several studies have shown that global crop production needs to double by 2050 to meet the projected demands from rising population. Climate change alters weather conditions and thus has direct, biophysical effects on agricultural production. Agricultural production, cropland area, trade, and prices show the greatest degree of variability in response to climate change, and consumption the lowest. The sources of these differences include model structure and specification; in particular, model assumptions about ease of land use conversion, intensification, and trade. This study identifies where models disagree on the relative responses to climate shocks and highlights research activities needed to improve the representation of agricultural adaptation responses to climate change.

Earlier seeding could mean increased yields in regions where there is adequate soil moisture, due to greater crop growth during spring rains. However, the forecasted reduction in precipitation could result in more frequent drought conditions and loss of yield.

Crop yield may also be influenced by the increased amount of CO<sub>2</sub> in the atmosphere. **Crop species vary in their response to CO<sub>2</sub> levels:**

- **C3 plants**, such as wheat, canola, and soybeans, as well as many pasture grasses and forage species (i.e. alfalfa, clover, fescue, Kentucky bluegrass) **grow better** when CO<sub>2</sub> levels are higher.
- **C4 plants**, such as corn, millet, and big bluestem **are less responsive** to higher CO<sub>2</sub> levels.

However, C4 plants have an advantage with higher temperatures, metabolizing CO<sub>2</sub> better when temperatures are over 32°C.

### **Climate change effects on soil quality needed to grow clothing raw materials**

Warmer air and soil temperatures **increase soil microbial activity** that speeds up the natural breakdown of organic matter. Organic matter is an important component of soil that is a natural plant fertilizer. Climate change might impact the **fertility** of soils by **breaking down organic matter faster** than the crops can use the available nutrients. However, a longer growing season with more vegetative mass produced may offset the increased breakdown of organic matter.

The drought conditions and extreme weather events predicted are expected to increase the risk of **soil erosion**. Greater precipitation during rainfall events and an increased likelihood of **flooding** and **heavy winds** during the growing season will be some risks for soil erosion. It may be necessary to take steps to ensure adequate **ground cover** at key periods throughout the growing season

### **Alterations of the growing season due to climate change.**

Predicted increases in Manitoba's temperatures could result in a **longer growing season** due to more frost-free days and earlier seeding times for most crops. **For every 10°C** increase in average temperature, the growing season could **lengthen by 10 days**.

Warmer winter temperatures could either reduce the amount of winterkill in fall-seeded crops, or decrease the thickness of snow cover and result in greater amounts of winterkill when cold temperatures are experienced.

Climate change effect on Livestock needed for some clothing manufacturing.

### **Direct effects of climate change on livestock**

The most significant direct impact of climate change on livestock production comes from the heat stress. Heat stress results in a significant financial burden to livestock producers through decrease in milk component and milk production, meat production, reproductive efficiency and animal health. Thus, an increase in air temperature, such as that predicted by various climate change models, could directly affect animal performance.

### **Indirect effects of climate change on livestock**

Most of the production losses are incurred via indirect impacts of climate change largely through reductions or non-availability of feed and water resources. Climate change has the potential to impact the quantity and reliability of forage production, quality of forage, water demand for cultivation of forage crops, as well as large-scale rangeland vegetation patterns. In the coming decades, crops and forage plants will continue to be subjected to warmer temperatures, elevated carbon dioxide, as well as wildly fluctuating water availability due to changing precipitation patterns. Climate change can adversely affect productivity, species composition, and quality, with potential impacts not only on forage production but also on other ecological roles of grasslands (2015: para. 4 line 7). Due to the wide fluctuations in distribution of rainfall in growing season in several regions of the world, the forage production will be greatly impacted

## **Climate change counteractive measures**

### **Central energy monitoring**

Installation of a computerized management system (Metering Online) in buildings that measures energy usage from electro-mechanical devices, including air-conditioning, refrigeration, lighting systems and various electrical installations. Metering Online will enable the monitoring and management of electricity and water usage across all business operations on a real-time basis.

### **Plasma screens**

Plasma screens in several stores and corporate buildings which display real time energy consumption and provide tips on how to save energy.

### **Solar energy**

Introducing solar installations to some of the company's' building to minimise the overuse of electrical energy. Doing so, in a long term effect will place a less demand of electricity on Eskom.

### **Lighting, ventilation and air-conditioning**

Transforming to energy efficient lighting and control equipment as part of the Eskom energy saving programme. Also, the installation of automated lighting systems in all stores will ensure that lights are switched off automatically after hours. A number of stores to be equipped with automatic doors to efficiently control the temperature. In certain stores, making maximum use of natural lighting and recycling waste heat from refrigeration to warm the stores.

### **Refrigeration**

Using natural gas (CO<sub>2</sub>) instead of synthetic gas for store refrigeration in new stores and retrofits is best. Unlike conventional synthetic refrigeration gases, CO<sub>2</sub> has virtually no impact on the earth's protective ozone layer and has a much smaller effect on global warming. It also uses less energy. Also trailing closed refrigeration in selected stores. On vehicles, improve the integrity of the temperature management through live fridge temperature management and control systems that are done remotely from a central location.

### **Distribution**

There are several ways in which to make distribution process efficient and sustainable. Having optimized routes travelled by the fleet by integrating transportation schedules using an online system that can be monitored on a real-time basis and ensuring that only this form of transport is used where local alternatives are not available.

### **Green Buildings**

Whenever there is a design of a new store, look at how to include energy-saving elements like natural ventilation, automated lighting systems, solar powered water heating and energy efficient lighting in the building's design.

## **Green Factories**

Help set up model 'green' factories with selected suppliers and work closely with them to find ways to reduce their carbon footprint.

## **Farming for the Future**

Establish a Farming programme that will delegate a holistic and scientific approach to farming that uses less water, chemicals and resources, whilst building soil health and encouraging ecosystems to flourish. Farming programme will be able to help suppliers adapt and become resilient to the infrequent weather patterns and impacts associated with climate change and global warming.

## **Deforestation**

Woolworths should recognise the role of reducing deforestation in mitigating climate change. Working to understand where the commodities they source (soy, palm oil, leather, etc.) come from, and how they can work to ensure that they come from sustainable sources and do not contribute towards deforestation.

## **Conclusion**

The above outlined theories about climate change makes it vivid that the climate change phenomenon is a major issue that affects the retail sector by the name *WOOLWORTHS*, both directly, on operations, and indirectly, on supply chains and at the consumer-use phase of products and services. It should without hesitation be in the company's best interest to have a role to play in both mitigating and adapting to climate change, and putting into implementation the necessary counteractive measure against climate change in order to avoid or minimise aggravated consequences.

## **Reference list**

1. Anon. 2016. *Effects of global warming on Woolworths*. Available: [https://www.woolworths.co.za/images/elasticera/New\\_Site/Corporate/Woolworths\\_Climate\\_Change\\_Position\\_Statement](https://www.woolworths.co.za/images/elasticera/New_Site/Corporate/Woolworths_Climate_Change_Position_Statement) (Accessed 6 October 2018).
2. Anon. 2018. *Global warming*. Available: [https://warmheartworldwide.org/climate-change/?gclid=EAlaIqobChMlrMzc0JX13QIVzrftCh358w\\_3EAYASAAEgI9\\_D\\_BwE](https://warmheartworldwide.org/climate-change/?gclid=EAlaIqobChMlrMzc0JX13QIVzrftCh358w_3EAYASAAEgI9_D_BwE) (Accessed 23 February 20 A16).
3. Anon. 2017. *Impacts of global warming*. Available: <http://www.nature.com/news/air-quality-to-suffer-with-global-warming-1.15442> (Accessed 7 October 2018).
4. Anon. 2016. *Causes of climate change*. Available: <https://www.wur.nl/en/show/Causes-of-climate-change.htm> (Accessed 6 October 2018).
5. Anon.201. *Impacts of climate change on fashion brands*. Available: <http://www.thefashionlaw.com/home/fashion-brands-are-feeling-the-effects-of-climate-change> (Accessed 11 October 2018).
6. Anon.201. *Impacts of climate change on livestock*. Available: <https://www.feedipedia.org/content/impact-climate-change-livestock-productivity> (Accessed 11 October 2018).



APPLIED SCIENCE  
FOR  
ENVIRONMENT  
SUSTAINABILITY  
ASSIGNMENT



MONDLI TULI

21603770