Chapter 28
Effect of Climate Change on the Manufacturing Sector

Zwelihle Wiseman Nzuza
Durban University of Technology, South Africa

ABSTRACT

The challenge of climate change in the world has hitherto perplexed scholars and professionals, with reports of climate change not sparing the manufacturing sector. All countries are most vulnerable to this threat and will suffer greatly if no action is taken. In the 21st century, scientists have confirmed with great concern the severe weather conditions that are expected to become harsher. The aim of the chapter is to explore the effect of climate change on the manufacturing sector. Literature has been used as a source of secondary data. The effect of climate is examined from five major business strategic positions: productivity, business risk, goods and services, chemicals and minerals, natural resources, and buildings. The chapter also covers the need for manufactures to adapt to climate change with various possible actions that can be taken by the sector against climate impacts on business. Continuous staff and management training and education on climate change is recommended.

INTRODUCTION

Concerns about climate change have been rising significantly over the past decade, and recently, the top five long term risks mentioned by the World Economic Forum's Global Risks Report are all in the environmental circle. With every key signs pointing to a bad condition getting worse (Drzik, 2020). Factoring climate change into the business equation is not common practice in the manufacturing sector, yet it is expected to produce goods and services and present these for human consumption. The impact of climate change on the manufacturing sector in today is something that cannot be disputed. According to the Kenya private sector alliance (2014), the world manufacturing sector is largely comprised of agro processing. Production includes paper production, textile and apparels, pharmaceutical and medical equipment, as well as building construction, and chemical-related industries (Ridoutt, Sanguansri, Bonney, Crimp, Lewis, and Lim-Camacho, 2016). Unreliable power generation and supply in most parts of the world is the reason most manufacturing industries make use of emergency power systems. This

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is evidence that the 21st century manufacturing sector has completely transformed from its traditional routine to a modern energy setup. Should no actions be taken to mitigate the impact of climate change, this study believes that manufactures will cease to operate.

The growing unreliability of power generation and supply calls for researchers to begin experimenting with the idea of allowing climate change to slowly aid in increasing productivity. The well-known 21st century scientist, Stephen Hawkins, predicted that climate change has the potential to collapse the entire world. However, regardless of several scientific hypotheses, there is a notable lack of awareness and misconstructions that have made it difficult for businesses to adequately respond to the trial (Crutezen, 2000). This is confirmed by Nabegu and Ali (2016), who state that the subject of change in climate has, to date, been discussed and investigated mainly by the scholarly society and very little has been shared to communities. While climate change has taken its toll and affected businesses, there have been gaps in addressing the effect of climate change in the manufacturing sector and it is without doubt that there remains scope for improvement in this field. This chapter discusses the role and impact of climate change in the manufacturing sector. In fact, the extreme weather conditions we are experiencing require our maximum attention as these are expected to increase (Nabegu and Ali, 2016).

BACKGROUND

Today is not the first time carbon dioxide and other greenhouse gas levels in the atmosphere have been extraordinary (Mann and Kump, 2012). Changes in the climate have been occurring for many years with the exception of the 19th century being the period that scholars started to see it as a potential research area. In the mid to-late 1980s it first emerged on the public agenda beyond the scientific society (Seacrest, Kuzelka, and Leonard, 2000). Climate change has been prevalent throughout industries, with erratic patterns that are hard to predict (Nabegu and Ali, 2016). According to Muhammad (2012), climate change signifies to long term variation in the statistical distribution of weather patterns over decades to thousands years of time. The change in climate is attributed to various factors, including the immense production of greenhouse gases and unjustifiable misuse of natural resources, while in the oceans, social activities have reformed the global climate pushing land structure beyond natural capacity, with changes in the atmosphere and other forms of living things (Nabegu and Ali, 2016). United nations framework convention on climate change (2012) defined climate change as "*a change of climate which is attributed directly or indirectly to human activity…"*. However, Muhammad (2012) definition of climate change includes *change due to natural variability alongside human activity*. Australian government (United nations framework convention on climate change, 2011) describes climate change as "*a change due to the observed escalations in human produced greenhouse gases that absorb heat from the sun in the atmosphere and reduce the amount of heat escaping into space"*. This superfluous heat is observed to be the major source of variations in the climate system. In general, the term 'climate change' through various definitions, qualifies as a pollution originating in human activity. Likewise, Mann and Kump (2012) agree that changes in the climate have been mainly the result of human activities and this is a ninety-five percent certainty according to the Intergovernmental Panel on Climate Change (IPCC), an organization which was established in 1988 to address intergovernmental issues on climate change. Having had to classify what climate change is in general, it is equally important to define it within the manufacturing sector. This definition is significant because manufacturing represents nearly 20% of domestic direct emissions, and it is indirectly accountable for an extra 11% of emissions through electricity use by households (Nabegu