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### **South Africa: A Land Being Destroyed By Climate Change And Water Scarcity.**

South Africa is a country of rich diversity and culture, deemed as the cradle of humankind, its people are known to be called “The Rainbow Nation” due to it being a boiling pot of diversity and culture. From a history of colonialism and wars, through times of a policy of segregation in what was known as Apartheid (apart-ness), South Africa has seen many civil wars and a lot of blood was shed in the fight for human rights, equality and freedom. South Africa has the richest economy in Africa and has rich resources including minerals such as diamonds, gold, and platinum. South Africa is well known for its immense beauty, rich biodiversity, and abundant wildlife, but this beauty and its growing economy are at the cold grip of a killer called climate change. President of South Africa, Jacob Zuma said at COP17, a conference for climate change which was hosted in early 2013 in Durban, South Africa that: “Climate Change poses serious risks for humanity, especially for the developing world. Climate Change can no longer be treated just as an environmental challenge, it is a holistic sustainable development challenge.”

“South Africa has a dual agricultural economy, with both well-developed commercial farming and more subsistence-based production in the deep rural areas. Covering 1.2-million square kilometers of land, South Africa is one-eighth the size of the United States and has seven climatic regions, from Mediterranean to sub tropical to semi-desert. This biodiversity, together with a coastline 3,000 kilometers long and served by eight commercial ports, favors the cultivation of a highly diverse range of marine and agricultural products. Products range from deciduous, citrus and subtropical fruit to grain, wool, cut flowers, livestock and game. While 12% of South Africa's land can be used for crop production, only 22% of this is high-potential arable land. The greatest limitation is the availability of water, with uneven and unreliable rainfall. Around 1.3-million hectares are under irrigation, and around 50% of South Africa's water is used for agriculture,” adapted from (SouthAfrica.info).

Agricultural activities range from intensive crop production and mixed farming in winter rainfall and high summer rainfall areas, to cattle ranching in the bushveld and sheep farming in the arid regions. Maize is most widely grown, followed by wheat, sugar cane and sunflowers. Citrus and deciduous fruits are exported, as are locally produced wines and flowers.

South Africa is not only self-sufficient in virtually all major agricultural products, but is also a net food exporter. It is also the leading exporter of protea cut flowers, which account for more than half of proteas sold on the world market, stated by the South African Embassy in The Nederland's. Other important export groups are wine, citrus, maize, grapes, sugar, apples, pears and quinces. Important export products include agro-processing products, such as under-matured ethyl alcohol and hides and skins.

South Africa's population increased by about 7 million to 51.19 million between 2001 and 2011. The country still has a young population, with most of the nearly 52 million under 39 years of age. Divided by gender, 26,582,769 are female and 25,188,791 are male. Along racial lines, 41,000,938 (79.2%) are black, 4,615,401(8.9%) are coloured, 1,286,930 (2.5%) are Indian or Asian, and 5,586,838 (9.6%) are white. In 2011, “other” was also included in the Census, and it accounts for 280,454(0.5%) of the total.(Statistics South Africa).

A typical poor urban family in South Africa is composed of usually 2 parents and 2-3 children, the fertility rate within South Africa has decreased significantly in the last 10 years. The latest fertility rate

measure is 2.42 births per woman (2011) and life expectancy is 52.62 years (2011) resulting in 1.2% annual change in the population growth rate (2011). Although the effects of substance abuse leads to single-parented homes in this case there would be a need for a stable income. Almost 11.2 million people reported receiving social grants. The majority was receiving child support grants (64.5%) followed by old age pension (21.2%) (Statistics South Africa).

If we look at the diet of the typical South African family it would be made up of primary starched-based staple foods such as maize meal, bread and beans. The reason for this is that it is cost effective and easy to access. Maize is one of the most common types of crop grown in South Africa.

A poor urban family would typically have access to basic education. The Constitution of South Africa states that everybody within South Africa have access to basic education, therefore there are many “no-fee paying” schools where disadvantaged families are able to send their children. This would be the same for health access as there are parallel private and public health systems in South Africa and it is also part of the government’s role to provide access to health services. Many poverty stricken families use public health systems as it is a free service. Many factors affect the quality of health care. Primary health care systems in South Africa are experiencing overcrowding, long queues of people, long waiting times, underfunding, understaffing, lack of infrastructure and a lack of resources. Despite the benefits of adopting and implementing the district health care system, health care services have remained inaccessible in many respects and have therefore negatively affected its optimum utilization or quality. “The wealthiest 20% of the population uses the private system and are far better served. 79% of doctors work in the private sector. In 2005, South Africa spent 8.7% of GDP on health care, or US\$437 per capita. Of that, approximately 42% was government expenditure” (SouthAfrica.info).

Poverty is a major problem within South Africa, “Using the upper-bound poverty line which takes into consideration both food and non-food needs, approximately 52.3 percent of the population was living below that line,” the South African statistics agency said. This is about half the population in South Africa living in some form of poverty. The lack of jobs and skills contributes to the problem of poverty and there is a need for developing sectors for job creation.

The link between poverty, incomes and household food security is not at all clear. While South Africa may be food secure as a country, large numbers of households within the country are food insecure. The South African government has committed to cutting poverty in half between 2004 and 2014. Achieving household food security is a critical component in meeting that objective. Access to food and water is perhaps unlike other areas of delivery, since they are essential to well-being and human development.

Many poor urban families would rely on social grants provided by the government. South Africa’s poverty rate has also brought about many changes in employment and wages, in the relation of employment to an urban poor family. We see that the need for stable income is filled from doing odd-jobs (garden workers, builders, house cleaning, vendors and shops from home) that do not bring in a lot of income. Unemployment is also a concern to poor urban families as the availabilities of jobs are low. This is due to lack of skills and resources to train people who cannot afford to get a good education.

In a highly unequal society with high unemployment, this redistribution through income transfers is essential. However, it makes poor households vulnerable to national policy choices and politics. It is essential that creative and meaningful solutions be found to drawing marginalized work-seekers into economic participation as part of a long-term poverty reduction and food security strategy. As part of this effort, a third potential contributor to food security might be small-scale agricultural production. Even though it seems counter-intuitive to promote subsistence or small-scale agricultural production in a semi-industrialized economy like South Africa, it may be a solution for high unemployment and low food

availability. One government initiative that targets food insecurity is social grants. These come in the form of old age pension funds, disability grants, foster care grants, care dependency grants and child support grants. All of these have been shown to increase women's purchasing power as well as their access to food (World Health Organization).

Food availability also affects the poor urban family. Most disadvantaged communities try to develop community gardens and there are numerous programs and initiatives for assisting families who need assistance. One organisation assisting in this concern is Meals On Wheels. Meals on Wheels is an international organisation aimed at assisting people who cannot afford food due to poverty. Within South Africa some chapters also provide seeds and promote jobs in their community gardens, by doing this they allow skill development in subsistence farming.

In a world where climate change is an ever-increasing concern, South Africa is not a major contributor to climate change as other larger countries. However, the effects of climate change are seen in many parts of South Africa primarily in agriculture, water scarcity and wildlife.

For example, the wine industry within Cape Town, South Africa. Cape Town's wine industry is the eighth largest wine producer in the world and exports about 500 million liters annually. This sector also provides more than 350,000 farm labor jobs and thousands more jobs for farm owners (Canada's International Development Research Centre and the United Kingdom's Department for International Development (DFID)). However, this industry has been experiencing a great deal of water scarcity compounded by erratic weather changes. It is noted that even a slight change in weather patterns and temperatures causes a great loss in the profits of the industry. The major impact is on export value. If export value decreases it will have an impact on farms and probably have many job losses.

The poor urban family is affected by the effects of climate change, as subsistence farming within communities face the problem when planting crops to feed their families. As a result, it is highly vulnerable to changes in climate variability, seasonal shifts, and precipitation patterns. Subsistence farmers are not able to adequately provide enough for their disadvantaged family. Due to food prices rising, poor families in rural areas rely predominantly on farming their own crops and creating a small income through selling some of the vegetables, fruit, etc. Unfortunately as climate change worsens, it will have a great effect on poverty and household food security.

Climate change has major effects within South Africa. The need to develop more cost effective and renewable forms of energy such as solar, wind, and hydroelectric power will ultimately assist the fight against climate change and more so drop the major cost of living in South Africa. South Africa's wind energy potential is large and the Eastern Cape and Western Cape provinces have the country's best wind resources. In South Africa the Western Cape has the greatest potential for wave energy generation due to the large coastlines, particularly off the coast of Cape Town which benefits from swells coming in from the south Atlantic. Hydropower is South Africa's second largest energy source (12% of the national demand) after coal, however a significant component of this is imported from the broader region. The country's internal hydropower expansion potential is limited but the abundant hydropower resources of the broader region are likely to be exploited in the coming years. In terms of solar energy, the country has the potential of using solar power, currently the country doesn't use full potential and development in this will assist many families in terms of cost of living. Eskom, South Africa's sole electricity provider, funded and has invested in providing many rural communities with solar water heating geysers to reduce the capacity on the electricity grid. This program would make it cost-effective for rural and poor urban families.

Agriculture and fisheries are expected to be most affected by these changes because these sectors are highly dependent on climate variables such as temperature, climate variability, seasonal shifts, and precipitation patterns. Because of the semi-arid nature of the country, there is an increase of farming on marginal land. Domestic agriculture is of course the main source of food for the country's population. Not only South Africa but also the sub-region will be affected, given that more than half of the region's staple, maize, is produced in South Africa. Roughly 70 percent of the population lives by farming, and 40 percent of all exports are agricultural products (World Wildlife Fund Panda).

Should the agriculture and fisheries potential be reduced, the socio-economic impacts would be severe. Many agricultural sectors are sensitive to the changes projected, and while some areas may benefit from rising temperatures, in other areas this may spell doom to the local agricultural industry. Small scale farmers and subsistence farmers are most vulnerable to the effects of water shortages and droughts. While larger commercial farmers have better infrastructure, such as boreholes, windmills, pumps and irrigation systems that may help them to cope with water shortages, they may also be affected by water restrictions. In summer rainfall areas, maize production (a staple food source) could be adversely affected, while fruit and cereal crops grown in regions that receive winter rainfall are expected to be negatively affected (Climate Emergency Institute).

Climate change will have a significant impact on food availability, food accessibility and the food system's stability in many parts of the world. Climate change poses a significant risk in South Africa in terms of increased crop failure, loss of livestock and impact on local food security. In some areas drier and warmer conditions are predicted. Elsewhere, wetter conditions are expected and will affect agricultural practices. "It will affect human health and livelihoods, as well as people's purchasing power, food markets and food security on a household level. In addition, natural disasters will be more intense, while pest outbreaks for both crops and livestock will become more frequent. It will change temperatures and rainfall patterns, influencing plant seasons and affecting certain crop yields", stated by the World Wildlife Fund South Africa(WWF South Africa).

Another scenario within South Africa is cattle and livestock farming, we notice that the effects of climate change in South Africa bring low-rainfall in some areas, including areas where livestock farming is a major practice. Due to droughts these effects will take toll on water and soil thus not providing the necessary water needed to grow grass for cattle to graze on, meaning farmers would have to spend more money on feeding cattle and livestock. Not only this, but drought would bring many deaths amongst livestock, ultimately affecting a great amount of the livestock industry.

As we see all the above-mentioned effects on agriculture in South Africa, we should be empowered to help reduce the impact climate change has made thus far, we should analyze the possible climate change adaptation strategies that are currently being implemented and also expected to be introduced. There are many organizations working to protect the world's environment.

The WWF (World Wildlife Fund), which is an organization devoted to reducing the impact of climate change around the globe works to achieve a "climate-safe" future by

- Advocating a new international climate agreement – one that is just and legally binding
- Promoting energy efficiency – the most rapid and cost-effective way to reduce CO<sub>2</sub> emissions
- Promoting renewable energy sources – like wind, solar, and geothermal power
- Preventing greenhouse gas emissions from deforestation – currently responsible for 20% of all emissions
- Developing and promoting climate change adaptation strategies– to safeguard the most vulnerable people and the most exposed ecosystems.(WWF.org)

“Much of the general public lacks access to adequate education or other information sources. As a result, much of the government’s policy and plans may go unimplemented or sidetracked by more “pressing” policies that promote immediate economic benefits,” stated by the World Resource Institute.

GenderCC initiated a pilot project on Gender and Climate Change: Raising Awareness, Building Capacity, and Influencing Policy in January 2010. The project focuses on working with women's groups in rural communities of the North-West, Limpopo, Western Cape and some peri-urban parts of Gauteng province.

“The overall goal of the pilot project is to contribute to integrating gender in climate change related policy making and adaptation strategies in South Africa. Focus areas are

- awareness-raising on the expected consequences and risks of climate change;
- documentation of women's experiences of climate change impacts on agriculture, water, housing, fisheries and related livelihood issues, as well as
- feeding into the process of developing adaptation policies and strategies for local, provincial and national government”(GenderCC).

USA for Africa, whose mission is to use the collective power of action, is an organization which fundraises in order to help specific groups in need. It helps to fund the Center for Civil Society Climate Camps, a project of the Climate Justice Now South Africa which has built partnerships with community groups and works to inform, teach and train civic groups in the Durban, South Africa area about climate change and what can be done on a local level to protect the environment, and create and maintain community gardens (Climate-Justice-Now).

Due to water scarcity within the south coastal parts of South Africa, many scientists are looking into various coping strategies such as the desalination of surrounding seawater (process in which seawater is filtered and salt is removed to make it potable). Replacing the leaking old pipe systems is another strategy being looked at. However both these process are not cost effective at all, and there are no longer any feasible land areas available to build any dams. Unfortunately the South African government is unable to fund these processes at this time, due to the fact that it will cause an even greater imbalance in the distribution of wealth, in-turn leading to even more economic problems, and higher food prices.

Within the wine industry in the Cape, many farmers have developed new technological ways to improve water efficiency. Farmers need to adapt to the situation by reducing the irrigation demand, change their crops or even changing the way they farm. Many farmers try to use water only when necessary and using it sparingly. Farmers have developed a mobile phone irrigation system that allows farmers to alter the amount of water crops receive by sending a text message to open/close up water to wet vineyards. The system works by using a mobile phone to send a text message, for example “open” or “close” to a remote server which acts as a receiver on the system. Here the transmitted text message is interpreted and this tells the mechanism to either open or close the irrigation system allowing better conservation of water sources. The advantage of this system is that it can make it easier for farmers to manage the water capacity used by crops and this system is simple and easy to use.

Many farmers are using traditional methods to help with reducing evaporation. They achieve this by using mulch in winter and it acts as a blanket to keep the soil moist. Mulching would ultimately reduce the amount of irrigation needed helping to conserve water. While these methods may not fully reduce the effects of climate change, it might hold the key to the survival of the agriculture sector in South Africa.

As climate change is increasing and the effects worsening rapidly, South Africa’s agriculture sector is at greater and greater risk of failing if nothing is going to be done. Although South Africa is part of numerous programs like COP17, a UN initiative and conference that brings various leaders together to

discuss the matter of climate change and ways to deal with its effects, but more must be done. Personally from my research, I think that while there are many private companies and research centers working on possible solutions to climate change, there is a need for government intervention. Many poor families and rural communities rely on small-scale farming and I would tend to believe that because of climate change, this is one sector that needs to be sustained and developed. Subsistence and small-scale farmers need to have access to information on ways to adapt to climate change. As a way to implement this, they would need access to finance. With the backing up of government involvement, we will need to provide more funding to the developments of effective technologies and training to assist low income, small scale farmers and subsistence farmers in dealing with the effects and impacts of climate change. If this is achieved, South Africa will be able to not only develop its agriculture sector, but will assist in maintaining the survival of the agriculture sector and in-turn providing a way to drop the cost of living and poverty by empowering people to do more.

### Works cited

- “South African agriculture.” SouthAfrica.info. Web. 6 Sep. 2013. -  
<<http://www.southafrica.info/business/economy/sectors/agricultural-sector.htm#.Ui3GgWSIBeI>>
- “Agriculture” South African Embassy in The Nederland’s. Web 6 Sept. 2013. -  
<<http://www.zuidafrika.nl/ks-agriculture>>
- “Statistics South Africa”. StatsSA. Web. 6 Sep. 2013. <[www.statssa.gov.za](http://www.statssa.gov.za)>
- “Health in South Africa.” SouthAfrica.info. Web. 6 Sep. 2013. -  
<<http://www.southafrica.info/about/health/health.htm#.Ui4oMmSIBeI>>
- “The Impact of Climate Change on South Africa.” Climate Emergency Institute. Web. 6 Sep. 2013. -  
<[http://www.climateemergencyinstitute.com/cc\\_s\\_africa\\_griffin.html](http://www.climateemergencyinstitute.com/cc_s_africa_griffin.html)>
- Canada's International Development Research Centre and the United Kingdom's Department for International Development (DFID). “Combating water shortages in South Africa  
“ Online video clip, *YouTube*. YouTube, 2 Aug. 2012. Web. 6 Sep. 2013.  
-<<http://www.youtube.com/watch?v=S0FK05GIoVM>>
- “Agriculture and Food Security in South Africa.” Age on Research. Web. 6 Sep. 2013. -  
<<http://ageconsearch.umn.edu/bitstream/58211/2/1.%20Altman,%20Hart%20%26%20Jacobs.pdf>>
- “Climate Change.” WWF South Africa. Web. 6 Sep. 2013. -  
<[http://www.wwf.org.za/what\\_we\\_do/climate\\_change/](http://www.wwf.org.za/what_we_do/climate_change/)>
- “Food security in South Africa: a review of national surveys.” World Health Organization. Web. 15 Sep. 2013. - <<http://www.who.int/bulletin/volumes/89/12/11-089243/en/>>
- “Raising Awareness, Building Capacity, and Influencing Policy.” Gender CC. Web. 15 Sep. 2013 -  
<<http://www.gendercc.net/about/national-activities/south-africa.html?L=3>>
- “Climate Change.” USA for Africa. Web. 15 Sep. 2013. - <[www.climate-justice-now.org](http://www.climate-justice-now.org)>