Woes and Ways Out of Carbon Footprint Implications: A Review

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ABSTRACT

Climate change and its effects on all aspects of human life makes carbon foot print a critical issue to be considered; since, the duo has direct relationship. Carbon emission influences climate change. The paper reviewed the implication of carbon footprint on the climate and its eventual outcome on the environment, humans and animals. Also, the sources: food, transportation, home, goods and services of carbon foot print were considered. Ways out of these woes were also spelt out; reduction in emission is one of the ways of combating further degeneration while offsetting helps to mob-up the excess emitted gas.

Keywords: Woes, Ways, Carbon Footprint, Implications and Calculator

1. BACKGROUND TO THE STUDY

In the recent times, global warming has created a worrisome scenario in all spheres of life due to its direct relationship with climate change. Global warming is linked to the amount of carbon and other greenhouse gases being emitted into the atmosphere. The amount of carbon you personally produce in a year can be determined using carbon calculator.

Carbon footprint is the amount of green house gas emitted by a person or population over a certain period of time. Consequently, the more of these gasses that is let into the atmosphere, the worse it is for the environment. Global warming is linked to the amount of carbon and other greenhouse gases being emitted into the atmosphere.

Your carbon footprint gives an indication of your impact on the environment, which is caused by the burning of fossil fuels such as oil and gas. It is measured in tonnes of carbon dioxide emitted per year. Carbon dioxide is a greenhouse gas and as such increases global warming. Carbon dioxide is constantly being exchanged among the atmosphere, oceans and land surfaces as it is both produced and absorbed by many microorganisms, plants and animals. However, emissions and removal of CO_2 by these natural processes tend to balance (EPA, 2015)

A lot of damage has been done to Nigeria's land through the processes of deforestation, notably contributing to the overwhelming trend of desertification. Desertification is the encroachment of the desert on land what was once fertile (Omofonmwan and Osa-Edoh, 2008). A study conducted from 1901 to 2005 gathered that there was a temperature increase in Nigeria of 1.1°C, while the global mean temperature increase was only 0.74°C. The same study also found in the same period of time that the amount of rainfall in the country decreased by 81mm. It was noticed that both of these trends simultaneously had sharp changes in the 1970s (Odjugo, 2010) From 1990 to 2010 Nigeria nearly halved their amount of Forest Cover, moving from 17,234 to 9041 hectares. The combination of extremely high deforestation rates, increased temperatures and decreasing rainfall are all contributing to the desertification of the country. The carbon emissions from deforestation is also said to account for 87% of the total carbon emissions of the country (Akinbami, 2003).

Individual lifestyle has immediate, future, *in-situ* and global impact on the environment; hence, it is imperative to know the implication of carbon footprint on the environment and how it can be reduced and offset. If everyone makes small changes to their lifestyle - like not leaving the television/laptop on standby – then, this will make a big difference in reducing our global carbon footprint.

Knowledge is power and its application is wisdom; the application of the knowledge about carbon footprint will help in making our world safe for our existence and generations to come.

2. SOURCES OF CARBON FOOTPRINT

Carbon footprint is said to be how much carbon dioxide (and methane) emissions each thing produces (Bergeler, 2012). Carbon footprint can either be natural (naturally occurring) or human-produced (through human activities). An individual's carbon footprint measures his/her impact on the environment in terms of greenhouse gases he/she is responsible for creating (human-produced). Human-produced carbon footprints are common with:

- Use of electricity
- Driving a car
- Producing beef and dairy products (ruminant)
- Disposal of goods
- Breathing of animals and humans also produces carbon dioxide.
- Travelling by air
- Bush burning
- Manufacturing industries

Major segments of life that generate carbon footprint are broken down into individual domains:

- food footprint
- travel footprint
- home footprint
- goods and services footprint

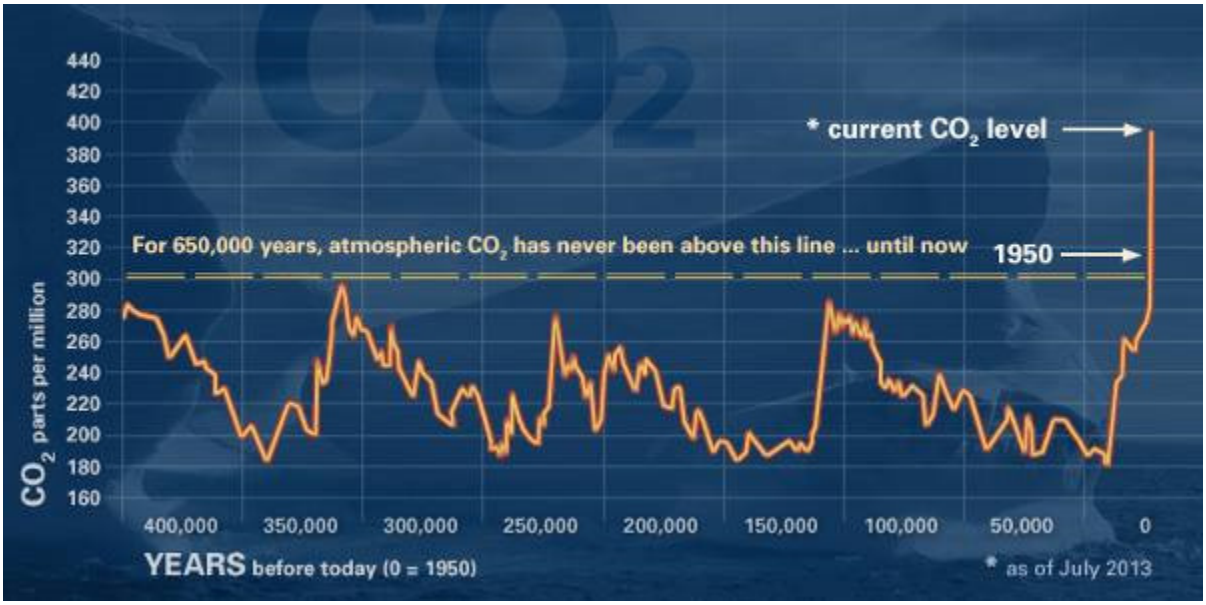

Figure 1: The relentless rise of carbon dioxide gas in the atmosphere
Source: NASA: Global Climate Change

3. IMPACTS OF CARBON FOOTPRINT ON THE ENVIRONMENT, ANIMALS AND HUMANS

For millions of years, the production of greenhouses gases was regulated by the natural systems of the planet. Gases would be absorbed and emitted at a fairly steady rate. Temperatures, meanwhile, were maintained at a level that supported life around the world until the advent of industrialisation. CO2 — a naturally occurring gas that is also emitted at great levels by human activity — is one of several greenhouse gases in the atmosphere. Other greenhouse gases include water vapor, methane, ozone, nitrous oxide and halocarbons. To understand the impact of these gases, we first start with the sun, which sends solar radiation in the form of light to Earth.

The atmosphere deflects some of this radiation, while the rest hits the planetary surface and warms the land and oceans. The Earth then radiates its own heat back up in the form of infrared rays. Some of those rays escape the atmosphere, while others are absorbed and then re-emitted by the atmospheric gases. These gases – the greenhouses gases – then help to keep the planet at its normal temperature. There are several greenhouse gases — some are more potent than others— CO_2 currently represents about 84% of all greenhouse gases emitted by human activities totaling about 30 billion tons a year.

Climate change is the ultimate effect of large carbon footprints. Greenhouse gases, whether natural or human-produced, contribute to the warming of the planet. From 1990 to 2005, carbon dioxide emissions increased by 31 percent. By 2008, the emissions had contributed to a 35 percent increase in radiative warming, or a shift in Earth's energy balance toward warming, over 1990 levels. The decade from 2000 to 2009 was the warmest decade on record worldwide, according to the U.S. Environmental Protection Agency's Climate Change Indicators Report (Jaines, 2015). It has also made the oceans about 30 percent more acidic, affecting a wide variety of sea organisms. That percentage is also expected to rise in the coming years. Global warming can cause catastrophic weather events, flooding, water shortages and disturbed ecosystems.

Carbon dioxide is a greenhouse gas that causes the earth to heat up over a long term (global warming). A difference of a few degrees on average can cause droughts and food shortages in some areas. The warmer temperatures make the ice near the poles melt and thus the sea levels rise causing severe flooding. This can also affect human health and expose them to diseases. With the increase in the rainfall, water borne diseases are likely to spread like malaria. With the increase in the global warming, the water in the ocean warms up and heats up the surrounding air, creating hurricanes and heat waves. Heat waves have caused more deaths in recent years, than have occurred in the last sixty years.

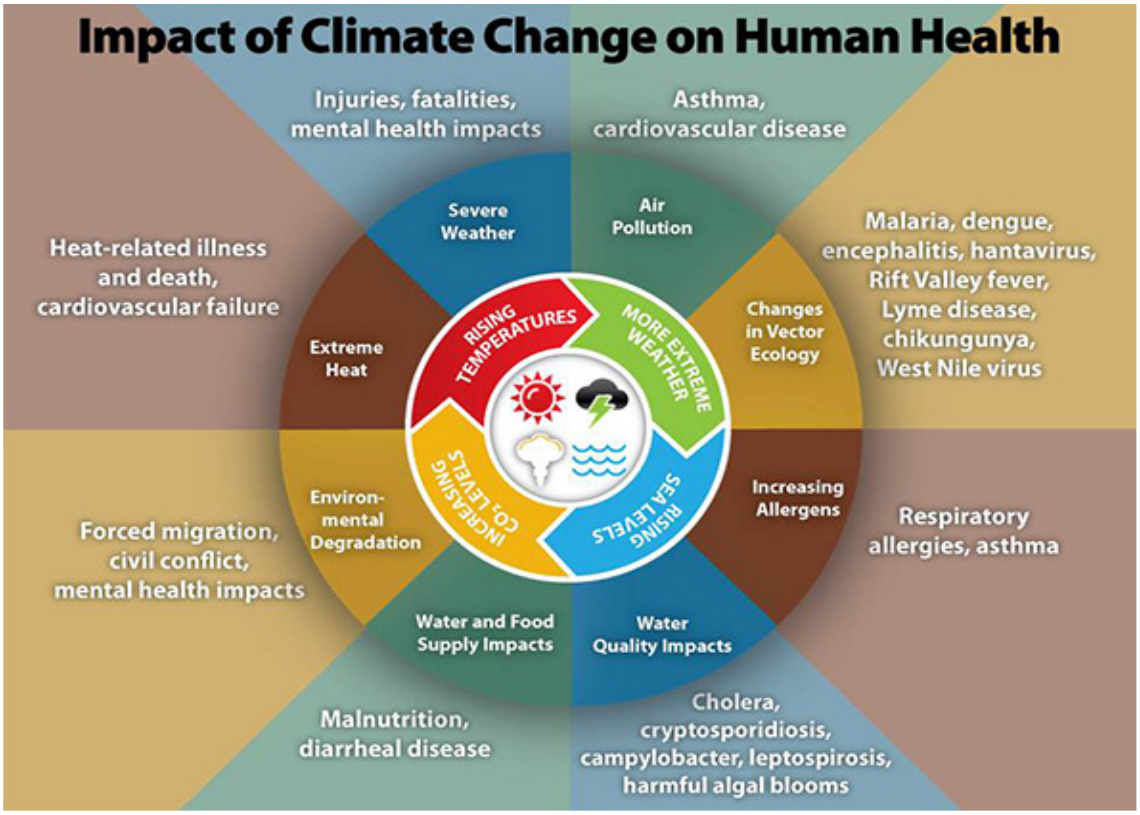

Figure 2: Impact of climate change on human health
Source: CDC, 2014

4. WAYS OF REDUCING CARBON FOOTPRINT

Reduce carbon footprint on food by:

- **Eating locally-produced and organic food:** Food miles are now firmly part of the new carbon lingo. This is a way of expressing how far an item of food has travelled before it reaches your dinner table, and therefore how much CO_2 has been emitted during freighting. A better concept is probably 'embodied energy', which takes account of all the carbon, water and energy that goes into producing any food or manufactured item. Either way, a good rule of thumb is that if you buy something that has been produced locally, it will usually have a lower CO_2 tag attached to it (Brave new climate, 2008).

- **Reducing beef and dairy intakes:** It takes a lot of resources to raise cows, and it's especially bad to buy from somewhere like Brazil, where it was grazed on land that used to be tropical forest but was cleared for agricultural use. Deforestation is a top contributor to carbon emissions and thus climate change (COTAP, 2015)

- Choosing products with the least packaging and complain to companies that over package items. About 29% of U.S. greenhouse emissions result from the provision of goods (COAP, 2015).

Reduce carbon footprint on travel and driving:

- Until petroleum-based aviation fuel is replaced, avoid flying when possible, fly less frequently, fly shorter distances, and fly economy class.
- Take fewer and longer vacations that are far away frequent and driveable closer to home.
- At work, use video-conferencing tools like Skype in place of *in-situ* conferencing
- Avoid travelling by private jet or being a space tourist
- Opt for alternatives to driving e.g. walking or cycling to avoid carbon emission carpooling or public transport to spread emission over many riders.
- Avoid speeding and unnecessary acceleration; waste fuel and money and increase carbon footprint.
- Avoid being stuck in traffic by taking alternative route or wait till the road is free

Reduce carbon footprint in home by:

- Pulling chargers from the wall and turn off computers instead of hibernation; leaving it plugged (on or off) contributes to global warming pollution
- Using a compact fluorescent bulb - it uses 66 percent less energy than a regular light bulb and can last up to fifteen times longer.
- Lowering the amount of energy used to pump, treat, and heat water by washing your car less often, installing drip irrigation so that plants receive only what they need.
- Making water-efficient choices when purchasing shower and faucet heads, toilets, dishwashers and washing machines.
- Training and orientating kids, friends and loved ones on the need to put all these measures in place

(COTAP, 2015)

Carbon offset

A carbon offset is a reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere (Goodward and Kelly, 2010). Carbon offsets are measured in metric tons of carbon dioxide equivalent (CO_2e) and may represent six primary categories of greenhouse gases; carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbon (PFCs), hydrofluorocarbon (HFCs), and sulfur hexafluoride (SF_6). One carbon offset represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases (Friend, 2009).

There are international organizations involved in the carbon offsets. Money realized from the purchase of such carbon emission is sent special organizations and research centre that carry out forestry projects.

Offsetting the amount which you are not able to avoid empowers you to take full responsibility for your carbon pollution, which is your contribution to climate change. COTAP offers a unique and meaningful solution; it focuses on certified forestry projects in least-developed regions that create life-changing income for the world's poorest people (COTAP, 2015) and mobs up CO_2 emitted in the developed world.

5. CONCLUDING REMARKS

Climate change and its effects on all aspects of human life makes carbon foot print a critical issue to be considered; since, the duo has direct relationship. The excess of this greenhouse gas in the atmosphere has led to global warming that is giving rise to so many human and animal diseases in the recent times. Reduction in emission is one of the ways of combating further degeneration while offsetting helps to mob-up the excess emitted gas.

6. CONTRIBUTION TO KNOWLEDGE

In the light of this review, the following are recommended:

- That effort should be made individually and collectively to protect our environment through the choice of food, economic mode of transportation, courteous use of home and office appliances to prevent further emission of carbon into the atmosphere.
- Carbon emitted can be offset through the purchase of carbon dioxide equivalent (CO_2e) and it is measured in metric tons.

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