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A Comparative Study of Climate Change and its Rippling Psychological Effect in Nigeria and India

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Abstract

Since the dawn of civilization, the aim of humankind has been to modernise and unveil the infinite potential of technology. With passing years a lot has been achieved in the realm of science. Unfortunately, it was not a complete victory, since something crucial was put at stake at the same time- nature. Nature has been the lone sufferer bearing the ravages of human actions. Climate change is one of the many ways of the environment to point at the ticking clock to save the planet before it's too late. Effects of climate change on physical health are very well versed by individuals, but the other important aspect of holistic health, that is mental health, is often overlooked. The aim of this research paper is to provide a detailed comparative analysis of the current climate change scenario in two third world countries- India and Nigeria- and concerning mental health outcomes. With time, the climate has drastically changed in both countries and has led to an increase in natural disasters. Which in turn, has raised the plight of those affected. The fruition of this paper is to call out climate change as a global emergency and render mental health its long due importance. The paper also outlines ways to minimise climate change and strategies to cope and adapt to the same.

Keywords: *climate change, mental health, flooding, eco-anxiety, India, Nigeria*

1.0 Introduction

"As you sow, so shall you reap." This proverbial saying reflects in all the spheres of life as a subtle reminder of how one's actions dictate the consequences. With the fast-paced progress of humankind, the flip side of the coin: the environment has borne irrevocable damages. Over the years, global climate change has already had observable effects on the environment. Effects of this change predicted earlier are now repaying in kind: loss of massive ice-caps annually accelerated sea-level rise and longer, more intense heat waves. These enormous changes have an impact on human health far beyond what the human vision can see. The identifiable diseases and quantifiable loss of overall life are not even a mere quarter of the devastating effects. As mental health awareness is on the rise, learning about its correlation with every possible aspect is of utmost importance. Climate variability is an essential part of the same.

India and Nigeria, the global south countries under study, are two of the many third world countries which are hit by climate change immensely. The current scenario in both countries is gravely concerning as summers tend to get warmer and monsoons wetter, leading to an alarming situation in both agriculture-based countries. Uncertainty and stress in regard to the issue at hand act as the stepping stones of psychological distress. As evident as it is, natural disasters caused by activities of humankind have also been on the rise. The aftermath of these disasters does not solely consist of loss of life but also of property and livelihood. Loss of peace due to trauma is also a contributor to various mental health problems like depression, anxiety and post-traumatic stress disorder. Moreover, the problem is exacerbated due to a lack of resources and access to psychological first aid and services in less developed countries like India and Nigeria; millions of people suffer and go through phases of distress without receiving any comprehensive treatment for their painful condition.

With an increase in mindfulness about day to day choices, every individual can do their bit to minimise climate change. There is a pressing need to make environment-friendly options more viable without causing more damage to the surroundings. The governments of the respective countries must also be held accountable for their policies and law, pertaining to protecting the environment. More importantly, the implementation of these laws should be checked upon from time to time.

Therefore, there is an imminent need for individuals and the government to align their goals to improve the issue at hand. Subsequent sections of this paper aim to compare the current scenario of climate change and its prevailing psychological effects in India and Nigeria. It provides comprehensive suggestions as to how the situation can be tackled in terms of both climate change and mental health in the respective countries.

2.0 Definitions

2.1 Climate Change and its Contributors

Change has been widely accepted as the inarguable constant fact of the planet and the universe at large, but when narrowed down to the climate; it will suffice to think otherwise. This change ends up being almost interminable, increasing exponentially with the activities of man and thereby placing every life on the planet in abject jeopardy.

According to The National Aeronautics and Space Administration (NASA), climate change is defined as "a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term." (Shaftel, n.d.).

Ironically, human activities have been the bane of humanity's existence; morphing the climate into anomalous changes as regards temperature, wind and precipitation, thus disturbing the balance of Earth's weather. Since climate change vastly entails the extraneous increment in Earth's temperature, humans should be held accountable. Right from the inception of the Industrial Revolution till this day, innumerable amounts of fossil fuels have been burnt as well as the transformation of large portions of land which were once forests to farmland, leading to deforestation (Canada, 2019). As already known, burning these fossil fuels indiscriminately releases carbon dioxide, a greenhouse gas, into Earth's atmosphere. Greenhouse gases produce greenhouse effects by absorbing net heat energy emitted by Earth's surface and giving it back to Earth (Mann, 2019).

2.2 Defining Mental Health

Mental health is a state of mind defined by emotional wellness, good behavioural adjustment, relative independence from anxiety and debilitating manifestations and a capacity to set up constructive relationships and adapt to the standard demands and stresses of life (APA Dictionary of Psychology, n.d.-b). The World Health Organisation constitution describes health as a holistic state of physical, mental and social well-being and not merely a shortfall of infection or ailment (Constitution, n.d.).

An important implication of this definition is that mental health is more than just the absence of mental disorders or disabilities. All humans are entitled to receive the best mental health services available, with no space for discrimination, neglect or ill-treatment of any form. Mental health is a matter of importance for all individuals to maintain good relationships, effectively cope with day to day stressors and make meaningful contributions to society. In order to maintain good mental health conditions, an individual must resort to personalised practices that encourage the feeling of well being and emotional security. Engaging in regular self-care routines, exercising, journal writing and diving in volunteer work may help in restoring balance.

3.0 India and Nigeria: Background of the Countries

3.1 India

India, a country situated in Asia, is the second most populated city in the world after Tokyo; housing about 31.1 million people (Macrotrends, 2021). About 65 per cent of the population is clustered in rural areas while approximately 35 per cent reside in urban areas (StatisticsTimes, 2020). Although it is expected that half of India's population will settle in urban areas in a few decades from now, this immense population in the rural area has substantially contributed to the climate changes experienced in India.

The ambiguity of the climate of India is something of note: it is almost impossible to make generalizations. Due to the presence of nearby coasts, South India is more humid than North India; with the Southern half of the nation experiencing temperatures greater than 40ºC during summer and at least 10ºC in winter (Wikipedia, 2021). Even though India fosters six main climatic subtypes, it still follows the usual standard four seasons with distinctive local modifications: winter (January to February), summer (March, April, and May), monsoon (June to September) and a post-monsoon period (October to December).

3.2 Nigeria

The land of diverse cultural heritage, Nigeria, is home to 250 ethnic groups, a wide array of religions and sophisticated visual arts. It has a dual economy, based on its rich natural

resources (oil, gas and minerals), traditional agriculture and the trade sector. Nigeria's 2020 population is estimated at 206,139,589 people at mid-year according to UN data. 52.0 per cent of the population is urban: 107,112,526 people in 2020 (Worldometers, 2020).
Nigeria has a tropical climate with variable rainy and dry seasons, depending on location. It is hot and wet most of the year in the southeast but dry in the southwest and farther inland. A savanna climate, with marked wet and dry seasons, prevails in the north and west, while a steep climate with little precipitation is found in the far north.

In general, the length of the rainy season decreases from south to north. In the south, the rainy season lasts from March to November, whereas, in the far north it lasts only from mid-May to September. A marked interruption in the rains occurs during August in the south, resulting in a short dry season often referred to as the "August break." Precipitation is heavier in the south, especially in the southeast, which receives more than 120 inches (3,000 mm) of rain a year, compared with about 70 inches (1,800 mm) in the southwest. Rainfall decreases progressively away from the coast; the far north receives no more than 20 inches (500 mm) a year (Nigeria - Climate, n.d.).

4.0 Current Climate Change in India

The present impacts of climate change have abruptly placed everyone on their toes. The Intergovernmental Panel on Climate Change (IPCC) reported that this century would be faced with an average global surface warming ranging from 0.3ºC to 6.4ºC (Pai, 2008). This solely is determined by the kind of model used for simulation. More so, the succeeding rise in sea level should range from 0.18m to 0.59m (Pai, 2008). Also, prior to the cessation of this century, Southern Asia will experience an average annual rise in temperature of about 2.5ºC in South East Asia, 3.3 ºC in South Asia, and 3.8ºC in the Tibetan Plateau (Christensen, J.H., et al, 2007).

4.1 Warmer Summers

The Indian summer is predominantly known for its hot nature with temperatures around 50ºC. The most important quantity that absolutely influences humans and the ecosystem is temperature. Judging by the increased warming rate per decade for minimum temperatures, maximum temperatures and annual mean - 0.13ºC, 0.15ºC, and 0.15ºC respectively, between 1986 and 2015 (Table 4.1). One can safely infer that the mean temperature across India has significantly warmed up, consequently causing summer to become warmer (Krishnan et al., 2020).

Table 4.1 - Studied variations over Indian land mean annual and seasonal surface air temperature between 1986 and 2015 (Krishnan et al., 2020).

Season	Temperature trends 1986–2015 (°C per decade)		
	Mean	Maximum	Minimum
Annual	$0.15^{*} \pm 0.09$	$0.15^{*} \pm 0.10$	$0.13^{*} \pm 0.10$
Winter (Dec-Feb)	0.05 ± 0.16	0.03 ± 0.20	0.07 ± 0.18
Pre-monsoon (Mar-May)	$0.26^{*} \pm 0.17$	$0.29^{*} \pm 0.20$	$0.20^{*} \pm 0.16$
Monsoon (Jun-Sep)	0.11 ± 0.12	0.10 ± 0.17	$0.11^{*} \pm 0.08$
Post-monsoon (Oct-Nov)	0.17 ± 0.17	0.14 ± 0.22	0.19 ± 0.20

IMD gridded station data generated the estimates. The bold values with asterisks (*****) points out that trends are important.

4.2 More Volatile Monsoons

India's characteristic geographical constitution leaves it with an unusual climate period of four seasons. With the monsoon being one of the four seasons, it lasts from June to September.

Sufficient moisture is substantially collected from the Bay of Bengal as a result of the rambunctiously blowing winds of the southwest monsoon over headland India (Lal, 2003). Rain reaches the northern half of the country due to these diverted trades occurring in the southeast. Central India receives a heavy downpour when a cloud is formed resulting from the movement of northwestward low-pressure systems moving inland just in line with the monsoon trough. Meanwhile, the monsoon trough is an indefinitely continuous feature in India whose axis is placed at about 22ºN and 27ºN of east and west respectively (Rao, 1976). While considering the volatility of the monsoons, it is imperative to note that 116cm is the long-term average annual rainfall for the whole country and in spite of this, the amount of rainfall across India is considerably variable in all ramifications (both in time and space). Table 4.2 below gives an estimated aerial distribution of India's annual rainfall (in percentage) (Lal, 2003).

Table 4.2 - Aerial Distribution of India's annual rainfall

Mean Annual Rainfall	Corresponding Percentage Area
0 – 75 cm	30 per cent
75 – 125 cm	42 per cent
125– 200 cm	20 per cent
> 200 cm	8 per cent

It is, however, a conundrum to carefully observe the pattern of these monsoons as the amount of rainfall varies significantly across different regions. The northeastern hilly states and the mountainous west coast receive the acme of rainfall. Also, the regions located at the foothills of the mountain stretching from north Bihar to Jammu incur above 100cm of rainfall and the same goes to West Bengal, Orissa, East Madhya Pradesh, Ghats, western coast and northeastern states of India (Lal, 2003). The orographic features of the west coast, northeastern states and the

submontane territory influence the heavy rainfall. Furthermore, the remote southeast part of the peninsula receives the lowest rainfall of less than 50cm. Therefore, the intensity of rain that these two monsoon seasons (the southwest monsoon and the northeast monsoon) elicits is enough to wreak havoc; causing grave floods that could plunge a whole region into destitution.

4.3 Flooding in Northwestern India

As previously discussed, the monsoons' fluctuations have been associated with one of the most catastrophic events in history. Though it may sound mild, flooding has rendered many northwesterners in India homeless and has left a lot in utter misery. History has it that the peerless well-coordinated river system located in the Thar desert of India experienced disastrous flooding as a result of the bizarre heavy downpour within the region in July 1979. After investigations were carried out on the sedimentary annals of palaeo floods happening within the lower Luni Basin and Sindari Gorge in order to compare floods of this dreadful degree with that of the recent geographical past: the result showed that 17 extreme floods have been associated with Luni River which no occurrence during this period could match (Kale et al., 2000). Interestingly, this unexpected flood caused seamless alteration in the channel morphology of these regions. Studies pointed out that the channel width, which was 40-700m before the flood, had waxed to about 500 – 1360m post-flood (Dhir et al., 1982; Sharma et al.; 1982). Even though the global average surface temperature has subsequently risen by about 0.65^{o}C over the past 4 decades till this century, the unusual monsoon rains still cause flooding in northwestern India, especially in the Indian desert.

It can be inferred that the current climatic situation is more precarious (with an exponential increase of energy trapping gases in the atmosphere) even more for India. In recent times, a little digression from northwestern India to the commercial capital city – Mumbai; It is known that Mumbai did strangely experience flooding every summer between 2004 and 2007. This was aggravated in 2005 when the city was drastically hit by the worst flooding ever recorded in its annals and generated estimated damages of about 500 mortality and nearly USD 1.7 billion

(GoM, 2005). Importantly, the same flooding besieged northwestern India, causing the economy to incur damages of about $3-5 billion USD, rendering 20 million people destitute by affecting above 35,500 km^2 area of land (Swiss Re 2006; Munich Re 2006).

4.4 Rising Sea Level in Coastal Areas

Another brunt of climate change is the present rise in the sea level within the coastal areas. Exonerating the aftermath of motion incessant variations in ice flows, it can be measured that the average rise in sea level ranges from 0.18m to 0.59m (Valliammai, 2015). India's large coastline spans about 7,000 km lengthwise next to the Arabian Sea and the Bay of Bengal in the west and east respectively: the ecosystems within these areas will ineluctably be affected by sea-level rise and as such, exposure to flooding will be the lot of the densely populated delta regions. It is no longer a myth that climate change has successfully been melting polar ice caps and glaciers in the past decades thereby causing coastlines, small islands and even low-level areas to be particularly submerged as great rivers and seas unexpectedly overflow their banks and sea levels rising above the average range.

This is enough to arouse panic; to further disclose the impending threat these coastal areas are to be faced with, Rikita V. Kapoor, in his article on the "Climate- Change Vulnerability of the Maldives: Implications for India" prognosticate that even though the Maldives' contribution to Greenhouse Gases (GHG) is almost negligible (0.0003 per cent of the world's total emissions), the topography of this independent Island country makes it more susceptible to the afterclap of climate change: that by the year 2100, the unrestrained sea level rise would be enough to submerge the whole Island nation. Although this is of great concern to the Maldives, India should be wary since its mainland is only about 330 nm Northwest of Maldives: as a matter of fact, India's Maliku (Minicoy Island belonging to the Lakshadweep) is just approximately 86 miles away from Thuraakanu (the northernmost Island in Maldives) (Kapoor, 2020).

5.0 Current Climate Change in Nigeria

The prevalent obstacle that has successfully stymied plans purported to develop any country is climate change: this hindrance is mostly felt by developing countries and Nigeria happens to be one (Hassan et al., 2020). According to up-to-date studies, it has been shown that the activities of man have proliferated the impacts of climate change and the returns of these changes have begotten extreme weather events; provoked a rise in sea levels and flooding, drying up of rivers especially in the Northern Nigeria, and gully erosion in the South East etc.

5.1 Flooding

As humans consume fossil fuels and carry out deforestation the earth warms up; causing a deviation from quotidian rainfall patterns, evoking extreme weather events, and thus, causing a rise in sea levels and flooding. As an inference from climate change, sea-level rise constitutes immediate threats to a large percentage of Nigeria's populace dwelling in the coastal regions due to the high chances of flooding. The topography of the coastline areas in Nigeria has subliminally made it very prone to flooding (Adelekan, 2010). Amongst the 11 countries which have been endowed with cosmopolitan port cities, it has been confirmed that Nigeria has the highest susceptibility to rising sea levels (Nicholls et al., 2007). Lagos – which is the commercial capital city and most populated place in Nigeria – has been classified to have the highest exposure to severe sea-level rise and with the untrammelled increase in its activities, Lagos is expected to expose the populace to the hazardous effects of these changes by over 500 per cent increase in the next 5 decades (2070s); ranking 15th and 13th in a future climate and current climate scenarios respectively (Nicholls et al., 2007). Apart from the Northern parts of Nigeria, other regions have seasonally felt the impacts of flood, which conspicuously affects the country's economic growth either nationally or regionally (Hassan et al., 2020b).

Approximately 20 percent of Nigeria's population faces the ominous risk of getting displaced by flooding: which has been doing so more than any natural disaster (Cirella et al., 2018; Etuonovbe, 2011; UNOCHA, 2015; Oluwaseyi, 2017). The most susceptible part of Nigeria to

the abysmal effects of climate change in the Niger Delta (Mmom et al., 2013; Hazards et al., 2014).

5.2 Drought

Another impact of climate change that is rife in Northern parts of Nigeria is the drought. These areas are replete with farmers who make a living off their farm produce and also send to other parts of the country. The Northern parts are highly valued; in fact, more than one-third of the country's population has an inexorable dependency on "rain-fed" agriculture (FAO, 2003). Suffice to say that Nigeria is inarguably susceptible to the hideous impacts of climate change (Ayoade, 2003). To further prove the effect of climate change in Northern Nigeria, prominent researchers – B. A. Sawa and A. A. Adebayo carried out an analysis on the "precipitation effectiveness indices" in over 10 Northern states. These parameters' decisive indices can be obtained from rainfall; they entail the beginning and end dates of rainfalls, duration of the rainy season, amount of rainfall in the months (Sawa & Adebayo, 2011).

The results showed that the rainy season starts later than usual; instead of April, it chose to begin on the 20th of May. Also, there was a deviation from the normal trends of the cessation date of the rains; the mean end date of the rains used to be September 27th, now it ends within the 20th and 25th of September. This leaves these Northern regions with less rainfall and more dryness of rivers. The average length of the rainy season in Northern Nigeria is estimated to be 130 days, but it has slowly been truncated over the past few years. These creditable results should serve as a wake-up call to the Nigerian government. They should devise a means to withstand these changes lest food insecurity will ravage the entire nation.

5.3 Gully Erosion in the South East

Longitude $5^{o}30^{I}$/ 9^{o} 3^{I} E and Latitude $4^{o}30^{I}$/ 7^{o} 00^{I} N defines the exact location of the South-East Nigeria which covers an area of about 75,489 km^2 and is made up of nine distinct states (Enete et al., 2012). Undoubtedly, the indigenous people of the South-East became aware of climate change by merely taking a look at their farmlands; they could ascertain that the gully

erosion associated with these changes has substantially hampered farming activities. Erosion has perturbed the South Eastern farmers for years, although a few studies carried out in those regions have discovered that cover crops are efficacious in shielding soils against heavy bohemian rainfall and erosion (Enete et al., 2015).

6.0 Psychological Effects of Climate Change

Climate change has been a topic of significant threat to public health for decades. With increasing awareness and sensitivity, this man-made menace has started to get its long due importance in the past few years. Even the subtle climate changes observed have affected millions. Pushing some, into a state of vulnerability and some, to a point of no return. Undoubtedly, climate change is the greatest challenge of this century, handmade with a dilemma by humankind.

The current scenario of climate change has innumerable impacts but due to inequity and privilege, certain parts of the population stand more affected. The impacts include morbidity and mortality due to temperature fluctuations, rise in vector-borne diseases, respiratory ailments and increased chances of injuries. An aspect of health overlooked amidst the chaos, time and again is mental health. Climate change does not only affect physical health but also drains and devoids an individual mentally.

6.1 Temperature Fluctuations and Mental Health

As the summers are getting warmer, the ambient temperature and exposure to heat can be commonly witnessed. Those without access to services or means to protect themselves from the same go through an emotional turmoil with increased irritability as their sweat drips due to the scorching heat. It has been suggested that there is a relation between temperature rise and aggressive behaviour (Anderson, 2001). Such heatwaves have been associated with mood disorders, anxiety disorders, dementia and anxiety-related disorders among others (Berry, 2010). Exhaustion, both emotional and physical, are the common after-effects of prolonged exposure to heat. Thus, there could be an increase in morbidity and occurrence of mental health disorders

especially amongst those who work in such extreme weather conditions. Daily wage workers are hit worse by the harsh climate. They often find themselves in an unavoidable scenario, where they have to work under all circumstances, for it may lead to reduced incomes and growing poverty (Kjellstrom, 2011). Longer winters, hotter summers and natural disasters are just some consequences that inadvertently affect mental well-being. A long, freezing winter can disrupt the internal rhythm and cause Seasonal Affective Disorder (SAD) and send an individual into a state of depression Other mental health conditions include antisocial behaviour and suicidal thoughts.

6.2 The Mental Health Conundrum

6.2.1 Solastalgia

All humans, as they pass through milestones of life, dream of building their own safe space called home: the comfortable place where they want to go back after a long day at work. All it takes is one calamity to cause utter despair in one's life. A part of the changing climate is this distress where individuals continue to live in the same place, but the surroundings of their dream palace are not the same anymore. Being hit by a disaster or living in a disaster-prone area may trigger mental health conditions. The place of comfort gradually turns into a wreck of discomfort.

The Australian environmental researcher and philosopher Glenn A. Albrecht coined the term 'Solastalgia', based on the words solace (something that renders comfort) and algos (Greek for pain). Attempting to seek solace in a much-loved place after it has been despoiled, one may suffer distress and feel devastated, deprived or abandoned (Albrecht, 2019, pp.37-8). As opposed to nostalgia - the homesickness experienced by individuals when separated from a loving home - solastalgia is the distress that is produced by environmental change impacting on people as they witness their loving home changes to ruins (Albrecht, 2007). Living in damaged surroundings reminds people of what they have lost and it is essentially not a sweet memory. People who experience a natural disaster are likely to suffer from solastalgia for a number of reasons, which may include the loss of housing, livestock and farmland, and the ongoing danger of living in a disaster-prone area. These losses and fears challenge people's established sense of place and

identity and can lead to feelings of helplessness and hopelessness (Warsini, 2014).

6.2.2 Farmer's Dilemma

The majority of the population in India and Nigeria is engaged in farming and the changing climate has severely impacted them. The heatwaves have converted once-fertile lands into low crop yielding areas. Damaged crops certainly impact the farmers in various ways ranging from psychological to economic. Poor harvests due to climate vulnerability lead farmers to borrow money to replant, with a guarantee of returning the amount after the new harvest season. Climate fluctuations, however, can result in multiple failed years, creating a ghastly cycle of borrowing. Their inability to sustain a livelihood, combined with growing debt, leads many farmers to take their own life (Arcanjo, 2019).

6.2.3 Eco-Anxiety

Eco-anxiety is defined as a feeling of chronic helplessness, depression, anxiety and resignation to the impending environmental catastrophe (Sharma, 2019). With the changing climate, anxiety about future events has been affecting people globally. Worsening air quality, rise in sea levels, droughts and catastrophic floods have led to this uncertainty and fear, especially among children.

The fear about the environment has deteriorating effects on children's mental health as they witness climate change and its horrific implications themselves. Eco-anxiety is adding to childhood and teen inactivity in north India and leading to increased physical isolation, obesity and over-dependence on social media and digital devices (Sharma, 2019). Adults too have a hard time escaping the vicious thoughts of a bleak and hopeless future ahead, often falling into the ruins of eco-anxiety.

7.0 Climate Shocks and the Disastrous After Effects on Mental Health

The changing climate and its concomitant effects in the form of increasing natural disasters have subsidized and traumatic impacts on the mental health of those affected. Loss of

life, livelihood, property mark a deep dent in the memory, failing to fade away even after bearing the relics of time.

In research from Obasuyi (2019), in 2018, the National Emergency Management Agency (NEMA) reported that over 1.9 million Nigerians were affected by severe flooding that ravaged 103 local government areas across 10 states in the country. The agency had reported that the flood of 2012 was the worst in over 40 years, affecting 30 out of Nigeria's 36 states, leaving 1.3 million Nigerians displaced, and resulting in 431 deaths.

A study released by the Council on Energy, Environment and Water state that agroindustrial global warming has left 75 per cent of India's districts prone to natural disasters (floods, droughts, heat and cold waves). Catastrophic floods and drought-like conditions have increased manifolds in the last two decades, leaving many people in misery (Kaur, 2020).

The horrific experiences faced by the affected people are usually not taken into account by the authorities, leaving them in a vicious, vulnerable cycle; later risking the mental health of individuals by increasing the risk of developing disorders like Post Traumatic Stress Disorder (PTSD) which is an anxiety spectrum disorder. Each individual experiences the symptoms in their way and they are usually inclusive of Re-experiencing symptoms, where something reminds them of the trauma and they feel that fear again; Avoidance symptoms, where they try to avoid situations or people that trigger memories of the traumatic event; Arousal and reactivity symptoms, which may cause them to be jittery or be on the lookout for danger; Cognition and mood symptoms, which are negative changes in beliefs and feelings (MedlinePlus, n.d.).

Other stress exacerbated disorders include the development of acute and transient psychosis and relapse of bipolar disorder. Faced with the loss of home, environment, social structures and loved ones, an individual may develop a bereavement (grief reaction) or depression. In 2018, a survey carried out in Kaduna by UN Environment and Federal University of Technology, Minna, established that 84.1 per cent of the participants had experienced at least one major environmental hazard; and a majority, 74.7 per cent had never been informed on preparedness (Obasuyi, 2019). This speaks volumes about negligence on the part of the government in terms

of relevant policies and implementation. It costs people their everything, leaving them to start their lives over from scratch amidst crisis and hopelessness.

8.0 Ways to Minimize Climate Change

The global community has come to a consensus to circumscribe the temperature increase to 2°C; and to do everything humanly possible to remain under 1.5°C warming (UNFCCC, 2017). This has placed all hands on deck, obliging every nation to stay true to this pursuit to and after 2050. In order to achieve this feat, Rockstrom et al (2017) suggested that if human activities that contribute to GHGs emission are reduced; the net emission of carbon dioxide will eventually be halved and the net-zero emission can be reached even after 2050 (Johnsson et al., 2019). This proposal was solely dependent on the analysis that Rogelj et al (2015) presented. The following ways can be strongly used to minimize GHG emissions and even mitigate climate change.

8.1 Reduction in the Production and Use of Plastics

When the degradation of plastics occurs in the environment and later on is uncovered to sunlight, GHGs like methane and ethylene are given off (Royer et al., 2018). This is no longer a trivial matter; in truth, every single process associated with plastic production or incineration of plastic wastes incessantly gives off GHGs (Chen, 2018). Exceeding the parochial view, it has been observed that both plastic production and the inveterate incineration of plastic wastes add to approximately 400 million tonnes of carbon dioxide annually (Eriksson et al., 2009). Though the reduction in the production of plastics, usage of plastics or even the reduction in the incineration of plastic wastes will not utterly mitigate plastic pollution to the environment, it can to a large extent curtail the emission of GHGs into the atmosphere (Tony, 2021).

8.2 Reduction in the Use of Fossil Fuels

Since the inception of energy consumption until this day, the primary source of energy has always been fossil fuels; and it has made up around 70 per cent of the entire GHG emissions: which comprises mainly CO_2 (Oliver et al., 2017). The fossil reserves in the world are

inestimable, countries like Venezuela, the USA, Australia, China, India, Russia and the Middle East have unquantifiable fossil fuel reserves on which their GDP is mostly based. In total, these countries harbour about 80 per cent of the world's fossil-fuel reserves (Johnsson et al., 2019). There has been an unwavering increase in the chief energy demand from fossil fuels in India, Venezuela, Middle East and China. Although some data portrays China to have somehow decreased its fossil fuel consumption, the growth is still pronounced both in percentage and absolute values. These countries whose economy is being enriched by fossil fuels happen to apply tangible subsidies to it, particularly for oil (IEA, 2018b; Victor, 2009). If these subsidies are removed, there will be a substantial shift away from fossil fuels.

8.3 Switching to Renewable Energy Sources

The exponential increase in the energy demand has successfully turned the world into a global village, humans cannot foolhardy continue to depend on fossil fuels at the expense of humanity's safety; switching to renewable energy is certainly one of the surest ways to mitigate climate change and global warming. These renewable sources need to remain sustainable if they must as well; meet the energy needs of posterity (Owusu & Asumadu-Sarkodie, 2016). There are two challenges to reckon with on this path to a sustainable future: procurement of supply of energy and curtailing the addition of this energy to climate change (Abbasi & Abbasi, 2010; Kaygusuz, 2012). It is surprising to realize that 1.4 billion people do not have access to electricity, while the rest of 85 per cent reside in rural areas (Owusu & Asumadu-Sarkodie, 2016). The ascendancy of power generation that is based on fossil fuels (Gas, Coal, Oil) and a proportional rapid increase in the world's population in the previous/ current centuries have given rise to a voracious need for energy which has caused global challenges due to the sporadic increment in the emissions of carbon dioxide (Asumadu – Sarkodie & Owusu, 2016a). There is a pressing need for all nations to unanimously change their energy systems, only then will humans stand a chance of vanquishing a common enemy: climate change. Since the normal flows of energy replenish renewable energy sources, they possibly should be sustainable: for this reason, they are expected to be infinite and not to be inimical to the environment (Twidell & Weir, 2015).

To mitigate climate change by supplanting fossil-fuel dependent power generation (which emits greenhouse gases), it is imperative to resort to renewable energy sources (Edenhofer et al., 2011).

8.4 Recycling of Materials

Another strategy to be employed in mitigating this common foe is the recycling action. Recycling employs practical mitigation and it is one of the most essential strategies that environmental educators have successfully used to battle climate change (Hassan and Kumar, 2009; Huber et al.; 2017; Tiew et al., 2019). Instead of disposing of waste that once they decay, they could likely emit more GHGs into the atmosphere (Yu et al., 2019). If policymakers should champion recycling, reduce consumer goods, transform solid wastes into pristine materials through diverse processes and educate the masses on the need to recycle food wastes: these will go a long way in minimizing the adverse effects of climate change on the environment.

9.0 Ways to Cope and Psychologically Adapt to Climate Change

The frightening reality of climate change has touched millions of humans across the globe. Looking at the current patterns, it is evident that the effects will only get worse, impacting the overall health of individuals. During a face-off with the threat of never recovering from the damages, most of the time stress conquers the fight. The situation created by humankind is undoubtedly gloomy in itself, but in order to win the healthy ecosystems back, various strategies need to be incorporated into everyday lifestyle. From making environmental-friendly choices to prioritising mental health, little steps every day can surely pave the way for a better future.

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Noble & Huq, 2018). Humans have mutated and survived various enormous changes in the environment through various stages of evolution. Thus, coping with the existing climatic changes and adapting to the ones that may occur in the coming time are the pillars of improving mental health when attributed to climate change and its devastating effects. Some of the mitigating measures to improvise the roots of

these pillars have been mentioned below.

9.1 Ecopsychology and Ecotherapy

Psychology is a diverse field of study, establishing its importance in all areas above and beyond what one can imagine. Taking the issue at hand into perspective, psychology and environment make a likely duo that is not given its due importance.

Ecopsychology explores humans' psychological association with the rest of nature and the ramifications for identity, health and well-being. Ecopsychology topics are inclusive of emotional feedback to nature; the influence of environmental issues such as natural disasters and global climate change; and the transpersonal measurements of environmental identity and distress (APA Dictionary of Psychology, n.d.-b).

As soothing as a walk in the park after a tiring day can be, similar positive effects have been witnessed on one's mental health and wellbeing when immersed in the bounty of nature. And that is how conventional psychotherapy and outdoor activities come into play and have gained popularity as Ecotherapy. Studies have shown that spending time in nature — as long as people feel safe — is an antidote for stress: It can lower blood pressure and stress hormone levels, reduce nervous system arousal, enhance immune system function, increase self-esteem, reduce anxiety, and improve mood (Robbins, 2020).

9.2 Support Groups

A support group is a group where individuals who share an issue come together to provide help, solace, and direction. An essential distinctive element of support groups is in their authority: a professional or agency-based facilitator who does not frequently share the troubles of members (APA Dictionary of Psychology, n.d.-b).

This provides an opportunity for people to share their despair as well as how they try and overcome it through various strategies. Under the careful guidance of a professional, support groups are a great way to reduce anxiety and depression related to climate change. Also, individuals who struggle to withstand the aftereffects of natural calamities may be able to openly

talk about their losses in the support group. Addressing emotions and grieving can significantly reduce distress and improve the coping mechanisms of individuals.

9.3 Psychological First Aid

As discussed earlier, climate changes are irrevocably leading to an increase in natural disasters and causing emotional misery. Just like medical first aid is suggested in case of injuries, similarly psychological first aid is an important tool that can help those affected by the aftermath of natural disasters. Psychological first aid is not a substitute for proper treatment of mental health conditions but can ensure basic care, comfort and support in times of crisis.

Psychological First Aid (PFA) is an intervention carried out during natural calamities to enhance safety, stabilize survivors of disasters and connect individuals to help and resources. PFA is administered by mental health professionals and other first responders. The goal of PFA is to evaluate the instant concerns and necessities of an individual in the repercussions of a disaster, rather than to provide on-site therapy (APA, 2019). Providing psychological first aid to those affected by a disaster is of utmost importance because it helps to develop a sense of safety and hope and may enhance recovery from emotional and mental trauma.

9.4 Adopting Behavioural Coping Strategies

Climate change calls for active participation from every individual since each one has a part to play. Like participating in climate action groups, lobbying politicians and authorities. As important as this activism is, it could easily lead to emotional burnout which may cause distress. To prevent this, one must strike a balance between doing their bit towards the issue at hand and taking frequent breaks. Maintaining healthy routines and disconnecting from news and social media from time to time may act as useful coping strategies.

9.5 Mindful Actions

Adopting an environment-friendly lifestyle is a necessity and responsibility of all individuals. Moreover, students, adults, and even the aged should be educated on the

environmental issues on the ground and ways they would play their part in solving these issues (Nordlund & Garvill, 2012). Taking care of nature in the smallest ways possible too can reduce an individual's vulnerability to aggravated stress levels.

- Consuming less meat
- Say no to fast fashion and opt for eco-friendly materials
- Looking for sustainable menstrual products
- Plant trees
- Switch to LED light bulbs
- Conserving water
- Using public transport

By making these little environmental woes, one can make a significant contribution not only to the environment but also to their overall well being.

10.0 Conclusion

After comparing and assessing the extent of rigorous climate change in India and Nigeria, there is an urgent need to address the issue at hand. Warmer summers, more volatile monsoon, flooding and rising sea levels and gully erosion in the respective countries point to an alarming situation of climate change which has already impacted millions and the future probability of affecting many more is very high. This research paper elaborates on the impact of climate change in the two global south countries and how it has had disastrous psychological effects on people. Enough light is thrown at the gravely concerning impacts of climate change like temperature fluctuations, uncertainty due to frequent displacement of livelihood, solastalgia, the plight of farmers and eco-anxiety. Due to further increases in natural calamities, many mental health conditions are manifested in individuals.

What weaves this paper together is the recommended ways to minimize climate change by reducing the production and use of plastic, use of fossil fuels, switching to renewable energy sources and recycling of materials. In addition to taking care of nature, it is crucial to nurture psychological well being as well. Hence, ways to cope and psychologically adapt to climate

change have also been included. There's a need to initiate dialogue on this intersectional topic of climate change and mental health to save the internal and external ecosystems of an individual. To restore the lost balance, one must act upon these changes and play their part. That being said, creating a safe space and giving mental health its due importance, especially when attributed to climate change is the need of the hour.

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