Future of Climate change: A Comparative Study and Analysis of the Impact of Climate Change

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Abstract

Climate change has been identified as one very intricate issue with large effects on both ecosystems and human societies throughout the world, as a whole. effects of the climatic changes to the spheres of food systems, environmental, and ecological effects, and economic impacts.
Besides the fact that climatic changes have an environmental impact, they have far-reaching economic consequences as well.

Such events, coupled with land dispossession because of them and the effects of such events, cause great economic losses. For example, research indicates that rising temperatures and changing precipitation patterns are responsible for vital agricultural losses, experiences that are translated to amplified effects on livelihoods and a deepening of food insecurity. In the same manner, increasing sea levels coupled with the degradation of forests impose economic pressures on economies, largely because of their effect on the coastal areas and poor populations.
The results are bound to call for strong action to be taken unitedly across the globe towards the change in climate and its influences.

Actually, these strategies to reduce the adverse impacts of climatic change and ensure the resiliency of the system towards environmental challenges need to include the adoption of practices in the sphere of sustainable agriculture, investment in adaptation measures, and policy interventions. It is from this perspective that one receives rich information regarding how climate change is playing out to portray such aspects as food insecurity, environmental degradation, and economic instability.
Keyword: Climate change, food systems, environmental impacts, economic impacts, human health, adaptation, mitigation, agriculture, biodiversity, crop yield, extreme weather events, greenhouse gas emissions, food security, health,

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introduction

The dramatically experienced change in the last 65 years of global climate change, with the 21st century having further impending variations in the world, global warming. The fact that impacts of climate change are felt at once in ecological, environmental, socio-political, and socio-economic domains makes it a serious intergovernmental problem.
The rise in temperatures is one of the aftereffects taking place in numerous planets due to the consequences of climate change. The situation of the climate crisis has been accelerated a lot ever since the invention of the industrial revolution.
This very rapid increase has been attached to a phenomenon known as global warming, an outcome of more greenhouse gases released into the atmosphere from human activities. Human activities, especially the burning of fossil fuels such as coal and oil, release a large amount of CO2 into the atmosphere, thus driving the warming process. air temperatures around the globe are increasing at an extraordinary rate. Air temperatures, over the last few centuries, since the start of industrialization, are around one degree Celsius warmer. This, in itself, is quite remarkable since two-thirds of the temperature change has taken place since 1975. Such a rate of increase in temperature is much faster than the past the planet has been subjected to.

This ice from the fast-melting Arctic and Antarctic, coupled with glaciers and snow all over the world, directly affects the current temperatures. The water released from this melting is bound to result in rising sea levels that may end up swallowing whole countries in the form of small islands and unleash major floods across many nations. Besides the floods' direct impact on human populations, they destroy important crops and farms that go a long way to support the growing world population. Hot

temperatures cause the oceans to be hot, and consequently, evaporation increases, the intensity of severe storms and heavy rains. Translate this to a more serious case of weather extremes,
The impacts go far beyond just temperature changes. The increased land and ocean temperatures have crucial implications for the ecosystems on Earth and make many species migrate to find a new place to live and survive.
This review gives an in-depth analysis of climate change and its impact on sectors critically hit, posing a weighty threat to the world agriculture, biodiversity, public health, economy, forest. It also tends to propose some useful actions and mitigation approaches that are adjustable as better alternatives. In-depth assessments are unpredictable weather and other impacts on the society from climate change. This analysis focuses on the economic, and environmental elements of a wide variety of sustainable global mitigation strategies and adaptation approaches and techniques.

Method

This article is based on the systematic literature review for research on a particular topic.
Various searches were performed to identify the appropriate publications in databases, such as the Web of Science and Google Scholar. Different phrases were used to search relevant documents such as impact climate change as prefix and using the following word "adaptation," "mitigation," "agriculture," "health," "forest," amongst others.
The initial keyword search first hit upon much-published material.
Since 2000, it has become impossible to read all of the discovered articles.
After finding well over 100 articles, and reading through the titles, the abstracts,
and the full pieces,filter out only relevant one
Next, we will proceed with a systematic review of the selected articles.

Results

Climate change is now one of the key challenges on the horizon for food systems worldwide as we move into a time of new uncertainties and upheavals. In fact, the array of impacts concerning erratic weather patterns and shifting crop vulnerabilities varies widely across the board, presenting an immense diversity of threats to agricultural productivity, food security, and nutritional quality. Farmers are also, with growing frequency, faced with a barrier to erratic rainfall and/or drought, heatwaves, and other climatic disturbances that compromise the necessary growing conditions for crops. This, in some way, does not reduce the quantity of food but also degrades the taste, nutritive, and general crop availability, hence disorganizing food supply chains. There is much more concern than even this over the reduction in crop diversity and the decline in agrarian resilience of many crops, which is becoming more vulnerable to environmental change.
This puts an extra burden on already weak food systems and compounds the situation for food, considering that the world population will be 9 billion by the year 2050. Most concern is for the staple crops such as wheat and maize since their range of threshold temperatures will experience great yield loss. This will cause economic effects on the agricultural as well as shortages in terms of food in the areas affected.

Raising temperatures have a significant effect on crop yields in general, and with respect to wheat and rice in particular, it was shown that this would have negative effects on productivity. This would be further enhanced in some regions around the globe, such as South Asia, South America, and Central Asia. These impacts are further heightened by high night temperatures, which interfere with the flowering processes and grain weight in rice crops. Other studies show that in the near future, heat stress would be experienced in more areas like the humid and subtropical zones, driving the agricultural productivity into more imperilment. Maize crops are at risk and more especially the grain production under an elevated temperature regime during the flowering stage. These results, therefore, are a wake-up call to take active measures at this point in time to minimise damages by climate change on the food systems, which will be a food security determinant globally.

Climate change essentially alters climatic patterns through human activity and therefore poses a critical threat to global biodiversity conservation and environmental stability. This change has caused a domino effect in environmental problems that are and will continue to seriously impact ecosystems, communities, and economies. One of the most common effects is the aggravation of flood hazards, noticed in the increasing incidences of extreme weather conditions and rising sea levels. Research in some areas, such as the UK and Taiwan, points at ever-increasing flood hazards, where in the former, studies have shown a great increase in flood hazard estimates. Added to this is the greater vulnerability brought by storm surges and worsened rainfall patterns, particularly along coastlines. Valuable ecosystems and important biodiversity are put into further danger, as the impacts go further than the direct effects of such inundation, such as how heavy rain events disturb natural processes, agricultural practices, and replenishment of groundwater resources, among others.

Coastal areas are more and more threatened by submersion, which puts millions of human lives at risk, combined with another factor: ageing infrastructure and urban development in flood-prone zones. This is further complicated by climate change-induced biodiversity loss and urgently calls for the need to take action to ensure they don't deteriorate further. Millions of other communities living in the forest around the world are equally in a particularly delicate situation with their livelihoods at stake and increased risk from climate change. Despite their precarious situation, climate change remains alien to most of the forest communities.

Climate disruptions destroy crop production in agroforestry and other crops, thus lowering yield, and the number of organisms causing diseases is increasing, thereby raising the risks of health, particularly in areas of high altitude. The number of diseases occurring due to mosquitoes and those caused by water have increased and are killing people in the Himalayas as well as in the region of Bangladesh. Addressing these multifold challenges, which are inimical to biodiversity, livelihoods, and well-being of present and future generations, requires immediate and targeted efforts.

Climate change economic impacts are a reality and not speculative. Climate change, in real time, has moved to shape both industrial supply chains and global markets. By far, the greatest shocks to all global economies are the drastic changes in the precipitation regime. This is what raises eyebrows for environmental policymakers and begets an urgent need for the proactive taking of mitigation and adaptation measures. It is exactly these types of droughts that impose huge potentials for economic losses, as faced by Europe, especially in high agriculture areas. United States events are now causing damage in the billions of dollars, from Hurricane Sandy in 2012, to point sharply to the economic toll of climate-related disasters. It then connects the links between climate change and economic vulnerabilities.

It has been the backbone of most economies recently deepened by the challenges of climate change: changes in precipitation and increased temperatures strongly impact crop production and food security.
The statistics also show a marked reduction in forest lands within Europe, which consequently results in billions of euros of economic losses. The developing countries suffer the most; for example, in Bangladesh, the economic impacts on livelihoods and infrastructure because of climate change run into hundreds of millions.
Climate change imposes costs far beyond the instant damage that the immediacy of those costs has imposed. By the year 2050, for example, trillions of dollars lost will average in each year. It will adversely affect low-income countries more and deepen the economic inequality that now plagues the world. Indeed, North America gets affected every year by climatic disasters whose economic damages run into billions, just in recent years; this attests to the fact that drastic global measures have to be taken in order to be able to handle the economic aftermath of climate change. This is a comprehensive approach that needs to be implemented in curbing the economic and territorial security threats of climate change, including scientific research, innovative adaptation strategies, and strong policy interventions. These include investment in climate-resilient infrastructure, nature-based solutions, and investment in sustainable agricultural practice. More importantly, however, key pathways to countries meeting systemic challenges in climate change ensuring, through carbon pricing, financial incentives for technology that is climate-smart, and international cooperation that all the economies and livelihoods of the world have a more resilient future. Eventually, the economic impacts of climate change will place a greater test on the global response with more and more innovative policy solutions founded on strong science, and a commitment to building a more resilient, sustainable future at local, national, and international levels.

Climate change is closely linked with human health and is therefore a multi-dimensional challenge that goes well beyond the direct physical impacts, and insinuates itself into broader social and psychological consequences. According to the World Health Organization, rising global temperatures are likely to add an appalling 250,000 deaths a year between 2030 and 2050, by the exacerbation of existing health threats and the creation of new ones. The spread of vector-borne diseases under the influence of global warming forms one of the major threats not only to the communities of animals and humans but also contributes to the loss of biodiversity and leads to the violation of the stability of the ecosystem. The changed climate also shifts the dynamics of infectious diseases, food and water security, mental health, and more to pose newer health challenges and further compromise the state of vulnerability in poor communities.
Vector-borne diseases such as malaria, dengue fever, and Lyme disease will likely shift from their current distribution and transmission patterns with increases in temperature and changes in precipitation patterns. This increases the threat for a population not acclimated to the diseases and augments the danger of transmission while further complicating disease control. Climate-driven disruption to food and water systems increases the risk of food insecurity and water-borne diseases, predominantly in low-income and marginalised communities, which already have reduced access to resources and low adaptive capacity.

The point of intersection between climate change and mental health further exacerbates the health burden because climatic change-related disasters are therefore inciting increased levels of stress, anxiety, depression, and post-traumatic stress disorder among the affected populations.
All these groups face the uneven burdens of climate change very heavily and, in fact, have them stand at a disadvantage. Climate change has further increased the vulnerability, through the interaction of social inequities that existed before, and negative health effects toward extreme weather events, food

and water insecurities, and infectious diseases. The challenges are interlinked, and timely action should be taken to protect human health and allow adaptability toward the changing climate. This calls for integration of action within sectors to mitigate greenhouse gas emissions, build healthcare infrastructures, and provide support to affected groups to make them capable of adaptation to health risks posed by climate change.

discussion

Impact of Climate Change on Food Systems:

Climate change is fundamentally causing chaining food systems in the world wide while at the same time imposing new and unprecedented challenges on agricultural productivity, food security, and nutritional quality. The increasing uncertainty from year to year,
the erratic and severe weather pattern that change is causing. In most of these cases, the farmers in such settings face numerous increasing challenges to the consistency in crop growth and yield, some of the most common climatic changes include unpredictable rainfall, droughts, and heatwaves, among others. Therefore, these generalised disruptions would not only affect the quantity of food production but also primarily affect the taste, nutritional value, and availability of the crops, hence putting into danger the stability of our food supply chains. Food security in the world has become a severe challenge to the impacts of climate change.

Some of the negative consequences are felt in crop diversity and agrarian resilience. Several crops have proved weak against the shifting environmental conditions and failing hardiness; hence, falling food varieties affect the sustainability of the communities. With a world population of 9 billion by 2050 (Raza, A., Razzaq, A., Mehmood, …, 2019),
it will compound the serious problem of food systems that are already fragile by adding to the demand for food.
crops at risk include significant staples such as wheat and maize since, in general these crops have very little temperature tolerance range.

This will significantly foretell high chances of significant reductions in yield, something that will affect very many economic activities of farm workers and the level of food shortage in areas where the crop is unstable. In addition, climatic impact on the environment and problematic challenges to agricultural sustainability and resilience include soil degradation, erosion, and loss of arable land. Adapting the world's agricultural systems to a changing climate will indeed be a formidable challenge, for even that level of improvement in those systems and methane emissions from rice cultivation might be reduced by such efforts. The implementation obstacles are significant, as are the tradeoffs with overall crop productivity. Again, change happens much faster than the natural adaptive capacity of plants and crops, and thus, developing resilience and assurance of food security requires new solutions and interdisciplinary approaches. Putting these all together, climate change impacts on food systems are varied and diffuse; high urgency and combined effort at all levels will be necessary to reduce vulnerability and enhance resilience. These are the inputs aimed at ensuring food security and

making food systems sustainable in the long term under a changing climate: sustainable agricultural practice and investment in research, technology, and policy interventions to lower greenhouse gases.

In determining the success of crop growth, abiotic factors like sunlight, soil quality, and rainfall play a crucial role,following decades due to the recorded variations in temperature, solar radiation, precipitation, and CO2. All these factors are included in various regulatory like progress and growth, weather tempted changes, pest invasions, water supplies high prices of agro products in the world's agriculture industry, and preeminent quantity of fertiliser consumption.

Lobell and Field (2007) stated that from 1962 to 2002, wheat crop output had condensed significantly because of rising temperatures. Accordingly, Gourdji etcl. (2013) confirmed the extreme temperature events of the common wheat productivity trends during 1980–2011 around South Asia, South America, and Central Asia. other studies (Asseng, Cao, Zhang, and Ludwig, 2009) have reconfirmed that increasing temperature depresses wheat yield and also causes harmful effects on biomass productivity,
The primary crop, rice, also experienced high night temperatures. These problems will be aggravated since the temperature will keep increasing due to climate change,
Another study conducted in China found that 4.6% of rice production per 1 °C has occurred due to increased night temperatures (Tao et al., 2006),

Apart from that, the average night temperature growth also pragmatically affected the output of the rice,
The response of rice productivity to the high temperature brings about differences in the flowering process, and with time, the seed set declines, hence affecting grain weight (Qasim et al., 2020; Qasim, Hammad, Maqsood, Tariq, & Chawla). Heat directly impinges on flowers, reducing the period of anthesis and hastening the time to reach an earlier peak flowering during the daytime.
The increase in the world average temperature is expected to cause a reduction in the yield in equal measures (Hatfield et al. 2011, Lobell and Gourdji, 2012).

the global climate models have shown that the humid and subtropical areas are likely to be the primary victims of future heat strokes,Humid and subtropical areas are located on the southeastern sides of continents, generally between the latitudes of 25° and 40° north and south.
Also the maize crop is also at risk from raised temperatures, mainly in the flowering stage. This lower number of grains relates to insufficient acclimation due to intense photosynthesis and higher respiration, and the high-temperature effect on reproductive phenomena. Maize, under heating (30-36°C) during the silking period, seems less sensitive to anthesis-silking intervals

Environmental Implications and damage:

Change in climatic patterns, mainly due to human activities, has set off a chain of environmental challenges that drags with its drastic results on biodiversity conservation.

The pattern of the climate experienced all over the world has undergone great change of late, mostly due to activities initiated by humankind. One of the most defining challenges that transcend geographical boundaries is that of climate change, which has proven to be one of the greatest changes that affect communities, ecosystems, and economies in greater consequences far more than anything which was previously thought to be the normal. One of the alarming ways climate change impacts are manifested is through the worsening of flood hazards. Works focusing on regions such as the UK and Taiwan have revealed the increasing flooding risks because of climate change scenarios. As an instance, research on rainfall-induced flooding in two UK cities, Bristol and Bath, reported a remarkable increase in estimates of flood hazard and noted a critical danger in present (Archer, et al, 2024)

Investigations on storm surges and patterns of rainfall in areas like the southwest part of Taiwan have pointed out the increased vulnerability of communities to floods. Areas of floods can increase up to 92% (Hsiao, et al,). Going to face many threats to the coastal ecosystems and biodiversity, since rising sea levels and occurrences of extreme weather will see the submergence of more habitats.

For instance, heavy storm outbreaks have been recorded to set in earlier, and this has far-reaching effects on ecosystems and biodiversity. For example, heavy downfall rains are among the extreme weather events that change timing and strength. These are much earlier in the calendar year, cause disruptions to natural processes, influence agricultural practices, affect groundwater replenishment, and thus inflict cumulative problems on already burdened ecosystems (Jiang , et al, 2023). Coastal regions, such as those that house vital Indian cities like Mumbai and Chennai, are in danger of submersion due to rising sea levels; millions of lives are at stake, and millions are displaced each year (Subramanian, et al, 2023).

Sometimes, these cities, like Erbil, become increasingly vulnerable to floods due to outdated drainage systems and Urban development in high-risk flood zones . Nature now calls for very speedy action against these impacts of climate change and help regain its former self. It will be a salvage for animals and plants for us and for the future generation.
Forests are the critical source of livelihood for close to 1.6 billion people worldwide
350 million of their lives depend on forest(Naumann et al, 2021).
Communities that are dependent on agro-forestry amount to 1.2 billion; 60 million indigenous people depend entirely on forests and their products to sustain their lives (Sunderlin et al. 2005). For example, in the whole of the African continent, over 2/3rd of people living depend on the forest resources and woodlands for their alimonies, e.g., food, fuel wood,The lives of these people are more intensely affected by the climatic disruptions, which in turn make their lives more difficult. On one hand, forest communities are significantly at risk of climate change due to their livelihoods, cultural.

On the other, they are not familiar with the term "climate change" (Rahman and Alam 2016) among the destructive impacts of temperature and rainfall is, the disruption of the agroforestry crops with resultant downscale growth and yield.

Though the impacts of climate change some studies also list a few more devastating effects on the prosperity of the communities living in the forest. For example, the increased population of mosquitoes, wild boar, and new species of wasps has made skin-borne diseases, such as malaria and other skin diseases, widespread among the people living in the Himalayas, especially at high altitudes, something that was almost non existent before the last 5–10 years (Xu et al. 2008).
Moreover, the people living at high altitudes in Bangladesh face frequent mosquito-borne calamities (Fardous; Sharma 2012). Besides, other rates of water-borne disease spread have also been heightened in other leading parts of Bangladesh, particularly by infectious diarrhea, cholera, pathogenic-induced abdominal complications, (Kroemer et at, 2009).

Impact of Climate Change on Economic and Land Loss:

Weather and increasing temperatures are taking a significant damage on the global economy in the word.
everything is affected by these changes.
Climate change is real, and its attached economic impacts are happening today. Industries, supply chains, and consequently, therefore, global markets are being, and have been, shaken by the direct impacts of extreme weather and shifting patterns of precipitation.

Economic Effects of Climate Change Climate immensely impacts the economic output and development of a country. Environmental policy makers across the world are paying more attention to climate change than ever because of its effect on economic growth (Lamperti et al., 2021). Therefore, it will help in establishing local adaptation programs and formulating effective climate policy contracts once what will be the overall effect climate change will have on the agriculture sector is understood.
Climate change-induced droughts are worsening across Europe and are poised to carry a high economic cost. Without preventive action, annual losses due to drought for the European Union and the United Kingdom could increase from €9 billion today to €65 billion in 2100. Those most at risk are southern and western Europe, which rely heavily on agriculture, poised to lose up to 10% of its value.

Hurricane Sandy of 2012 in the United States offers a high-profile case in point. There is much dispute on whether the storm was caused by climate change. Still, its impact was intensified by rising sea levels, a consequence of climate change itself, resulting in economic losses of more than $60 billion. Here, simulation studies show that contributions from human-induced sea level rise were considerable in the damage, underlining that part of the damage from climate change was, in turn, caused by climate change (Strauss, et al, 2021).
Past studies have shown the impacts of climate change on agriculture. The effect is on the agriculture sector, in several regions of the world. Currently, the focus is shifting in research to understand how climate change may affect farming in other regions and ways in which adaptation can be made to it because farming and agriculture important for economy and some country their primary income is farming (Gleditsch, 2021)
Forests also do not escape climate change, instead it is estimated that European forest lands will decrease by 14% to 50% by 2100. The economic consequences of these losses run into several

hundred billion Euros. The present study of climate change in Bangladesh is particularly exposed to severe risks of climate change, leading to economic losses between USD 520 and 720 million USD. A large portion of the population has to bear disturbances in their lives and economic base due to economic severe effects of climate change shown(Hanewinkel et al, 2013).

The world's average temperature been on a steady since the 1980s and has dramatically changed the patterns of climate in the globe and increased. Growth of agriculture is a factor that affects the crops and farming decisions also production levels of farmers (Alhassan 2021).
Some of the devastating climate and natural disasters have impacted the crop production of the locals in those countries. The growing businesses and populations have given a little respite to mitigate the outcomes of these natural calamities, which now may threaten the lives of the human race.

Total world output would have declined by an expected 11 and 14% by the year 2050 due to climate change, which is estimated at $23 trillion every year, according to a report by the Swiss Reinsurance Company Ltd (Swiss Re). Some developing nations would reel off, losing over 20% and even 40% of economic output, whereas wealthy country economies like the United States would drop by about 7%, the costs to the world economy from GHG emissions in the leading economies are Between 1990 and 2014, it was estimated that GHG emissions had imposed almost $2 trillion of costs on the American economy.

North America Economic Damages from Climate Change, even under a scenario with the possibility of the world's temperatures rising to 2.8˚C by 2100, warming the climate may cost the US as much as $520 billion each year. Holding temperature growth to 2.8˚C might save an economy from a $224 billion loss. However, the region has already absorbed a lot of economic losses. For example, over the past three years, climate disasters have accumulated costs amounting to $415 billion for North America, with large wildfires, hurricanes, and flooding as main drivers.

In short, the financial impacts of climate change associated with loss of precious land raise the alarm for an immediate requirement of coordinated global action. From proactive adaptation to innovative solutions, there is much more to be linked to climate change than an environmental imperative. It falls under the mandate of critical economics to keep the livelihoods of people, industries, and economies intact across the globe.
However, with the potential for additional cascading impacts, this has then extended beyond the direct economic impacts, such that a shock in one economic sector or geographical region can flow across globally interlinked systems to generate more generalised economic instability and vulnerabilities.

This will involve fine modelling in terms of the impacts of extreme weather, projections on land-use change, and an assessment of the vulnerability of critical infrastructure and economic sectors.
Investment in climate-resilient infrastructure and nature-based solutions therefore adds to the adaptive capacity of this community and protects the economic assets therein.
This could be mainstreamed at the policy level in national and local economic plans, land use strategies, and disaster risk management. Efforts will have to be made to address disproportionately greater impacts on some of the most vulnerable populations, including communities with low income, small island nations, and least developed countries. This would be possibly achieved through the facilitation of targeted financial support, building of capacity, and the empowerment of local stakeholders in the design and implementation of adaptation strategies.. These also need a commitment from many ways of intervention to bring about a more resilient.

Climate change and human health:

(Okoro et al, 2023) cited the global spread of vector-borne diseases as one of the major causes of the death of so many species. Some not previously described or even not yet reported diseases could further be demonstrated to have the potential for recurrence (Subasinghe et al., 2023).

The likelihood of certain diseases increases due to the environmental changes associated with climate warming, and this An idea can be supported by specific pathogenic microbial strains, vector-borne infections, asthma, and mental cardiovascular diseases, acute and chronic respiratory diseases, and increased morbidity due to heat and heat-related disorders are only some of the many health effects as a result of climate change consequences like Extreme warming,
shifting ecosystems, rising sea levels, and increasing CO2 levels Climate change exacerbates public concerns, distress, and psychological health problems. Posttraumatic disorder may Arise from regular exposure to major climate calamities such as geological disasters. Communities living in flood-prone areas in perpetual fear of drowning and death.

Climate change can have an effect on human health , beside that from the direct impacts that extreme weather events can bring about changes in the dynamics of infectious diseases, food and water insecurity, and mental health.
Diseases such as malaria, dengue fever, and Lyme disease will be influenced in their geographic distribution and transmission with the effect of global warming and altered precipitation patterns.

Vectors such as mosquitoes and ticks would expand into new ranges, and populations that had never been exposed to these diseases would potentially become more exposed, and hence more sensitive. Changes in the weather patterns could create conditions that are ideal for the multiplication and spread of waterborne pathogens, hence increasing in number the disease outbreaks related to cholera and typhoid fever. The climatic change crisis brings to crisis the food and water systems and has human health implications. This leads to food and water systems being put under stress, with results in their potential collapse. The conditions that result bring about cases of food shortage, which bring about cases of malnutrition and the displacement of populations. It also causes an increase in the level of water supply shortage, which besides being useful for drinking, also finds use in sanitation processes, and in so doing increases the risks of occurrences of waterborne diseases as well as poor hygiene practices causing negative health outcomes across the population.
Climate-related disasters, such as hurricanes, wildfires, and flooding, may expose persons to increasing levels of stress, anxiety, depression, and post-traumatic stress disorder (Clayton et al., 2012).

But added to the uncertainty about the future, climate change might even turn into an existential threat—a process bound up with "climate anxiety" that can bode ill for the well-being of both individuals and communities.
Climate change is impacting human health indeed not only through the direct physical impacts of the extremity of weather events, but also through more indirect pathways of change in infectious disease dynamics, food and water insecurities, and mental health.
This implies that vectors such as mosquitoes and ticks, if migrating further into territories newly opened up, would expose populations that were initially not exposed to diseases carried by these vectors, hence increasing their vulnerability. Changing weather patterns have been shown to lead to

ideal conditions under which multiplication and spread of waterborne pathogens take place, thereby increasing the number of outbreaks of diseases such as cholera and typhoid fever.

Climate change is a stressor on the food and water system with implications for human health. Moreover, it exacerbates the scarcity of water supply, which is useful not only in the aspect of drinking but also in sanitation, and increases the risks of the occurrence of waterborne diseases along with poor hygiene practices—thus, poor health outcomes among the population. However, in recent years, many quarters have been appreciating that climate change is a very crucial public health concern since it has become linked to psychological and mental health impacts. Exposure to climate-related disasters, such as hurricanes, wildfires, and flooding, can increase stress levels, anxiety, depression, and post-traumatic stress disorder (Clayton et al., 2017).

But even more so if combined with an uncertain future, climate change may be an existential threat, a threat inherently coming with "climate anxiety" that may compromise the well-being of individuals and their communities. Climate change and health are linked in this nexus. These burdening facts present a disproportionate share of climate change on such disadvantaged groups as low-income communities, minority racial and ethnic groups, the elderly, and people with serious underlying medical conditions. This is mostly associated with the socioeconomic disparities that often make some groups more vulnerable to the health impact of climate change than others.

In particular, the poor lack the resources, health care, and adaptive measures that are put in place to protect them; they will, therefore, be subjected to more exposure of the extreme weather event, food and water insecurity, and the rise of infectious diseases. This nexus becomes related to health and climate change, where experiences by default will manifest within the disproportionate share of the burden of climate change that falls on the suffering disadvantaged groups such as low-income communities, minority racial and ethnic groups, the elderly, and those with serious underlying medical conditions. This often associates the fact of socioeconomic disparities, hence making some groups more vulnerable to the health impacts of climate change than others.
For instance, if the destruction by the extreme weather is to the disadvantage of the poor persons, who would not have resources, health care and adaptive measures taken to protect him, then this would most probably make them very vulnerable. Events which might happen are the occurrence of the extreme weather, food and water insecurity, and the rise in the infectious diseases.

Those communities are under pressure because floods wash infrastructure and human lives. Hurricane of Katrina worsened the fate of the victim communities and human beings Mental health. Antimicrobial Resistance (AMR) is another emerging global health concern with potential (Adebisi & Ogunkola, 2023). Health professionals worldwide are concerned. Many pharmaceutical companies manufacture large Vast amounts of antibiotics and dangerous microbes are steadily developing resistance to them; this may eventually destabilise the national and global economy. In the post-antibiotic era, the susceptible antibiotic bacteria cause endemics and pandemics once again . For diseases like cancer, tuberculosis, HIV/AIDS, malaria, and many other conditions, it has become inordinately expensive and complex (Pfavay et al 2021). A simple example showed the rapid spread of antibiotic-resistant bacteria across the borders . Second- and third-generation antibiotics, such as the most famous types of cephalosporin antibiotics, are They are more costly, have a broader spectrum, are toxic, and have longer durations of treatment than first line drugs

Conclusion

One could go so far as to say that the trajectory of our planet's future is inextricably linked to what we do today to deal with climate change in all of its aspects, from the devastation of the world food system to the decimation of ecosystems and deep into the realms of its repercussions, the impacts of climate change are deep and wide.

All these hard challenges, however, present opportunities for innovation and technology , collaboration, and radically transformative change for the future. Realising the truth now and taking proactive measures that may pave the way for a future more sustainable than inaction, we can reduce the effect of these negative consequences and assure less adverseness in the condition.

Sustainable investments in agricultural practices, adaptation, and building resilience are three fundamental pillars for effective response for challenging climate change. More importantly, international cooperation and solidarity are very important responding to the worldwide challenge, also because the impacts of climate change cut across geographical boundaries, affecting almost every place in the world.

We are collectively, communally, and nationally responsible for the fate of this earth. Embrace sound environmental stewardship. This will render the path impactful and blooming for the coming generations. It is high time for action. now have the opportunity to save the Earth and its ecosystems for the present and future generations for better world. We will do this together, raising to the occasion called climate change to make a brighter world. The right kind of policies should be put in place to help mitigate the effect of climate change on these terribly vulnerable industries, such as agriculture. Longer growing seasons in such frost-prone areas may well portend enhanced yield amounts from later-season maturing cultivars. A split season with a shorter summer fallow may be of benefit to some short period crops such as wheat, barley, cereals, and many vegetable crops if warmings are likely to lead to a prolongation of the warmer month highs above critical thresholds. The shift in planting date in tropical and subtropical regions, where the season is mainly limited by rainfall, will also increase in its difficulty, if not largely contingent upon changes in precipitation pattern

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