

Climate Change Impact , Human Rights, and Social Justice-An Appraisal

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Climate change is still making a detrimental global impact leading to unprecedented heatwaves, scary storms, floods, widespread water shortages, health problems and the extinction of a million species of plants and animals. In view of the urgency and complexity of climate change, it is imperative to develop a comprehensive action plan including all sectors of economy to prevent the causes of this crisis and devise suitable mitigation and adaptation policies. Climate change continue to threatens the effective enjoyment of a range of human rights including those to life, water and sanitation, food, health, housing, self-determination, education, culture and development. It also disproportionately impacts poor and the vulnerable people in both low and high-income countries. It is imperative to apply a rights-based approach which clarifies the obligations of governments and businesses, catalyses ambitious action, highlights the plight of the poorest and the most vulnerable, and empowers people to get involved in designing and implementing appropriate solutions.

Introduction

Global climate change poses a serious threat to natural ecosystems and biodiversity in tropical and temperate climate zones. It is now established that climate change is caused by anthropogenic emissions of greenhouse gases such as CO₂, CH₄ and N₂O which have devastating effects on the planet earth. The physical climate change impacts are an increase in average surface air temperatures, melting of glaciers and ice sheets, sea-level rise, and changes in the precipitation patterns. Over the past 70 years, the Earth's temperature has increased by approximately 0.7°C. According to the Intergovernmental Panel on Climate Change (IPCC) and based on different emissions scenarios, there will be a rise in global mean temperatures of 0.9 to 5.4°C by 2100 (Hsiang and Kopp, 2018). These physical changes are projected to considerably affect natural and economic systems, for example, by increased heat stress, changed water availability, and increased flooding probabilities. In essence the overall estimated economic impacts of climate change are negative and sometimes disastrous. Besides, climate change negatively affects people's rights to health, housing, water, food and other essential commodities. These negative impacts will increase exponentially according to the degree of climate change that ultimately takes place and will disproportionately affect individuals, groups and communities in vulnerable situations which includes, women, children, older persons, indigenous peoples, minorities, migrants, rural workers, persons with disabilities and the underprivileged population. Poor people tend to live in the areas most vulnerable to climate change mostly prone to cyclones and recurrent floods. About 14% of people in developing countries live in low-lying coastal zones. Nearly 29% of the world's population lives in arid regions. These communities are particularly susceptible to droughts and floods. Climate change disproportionately hurts the young and the old, and it exacerbates gender inequity, as women are usually responsible for fetching water, cooking food and gathering firewood, tasks that climate change makes much harder, especially in developing countries. With global warming phenomenon, labourers, farmers, fishing communities and those living near the sea coast are suffering frequently. Rural communities are severely affected because of the inability to enjoy their culture due to climate change's impact on land and ecosystems of historical, cultural, and spiritual significance. Climate change poses the greatest threat to those least responsible for it, including low-income and disadvantaged populations, women, racial minorities, marginalized ethnic groups and the elderly. To make matters worse, these groups are already vulnerable to other inherent challenges. Conversely, those who have contributed the most to climate change are in a better capacity to protect themselves from its impacts. It is now a well established fact that anthropogenic climate change is the largest, most persistent threat to the natural environment and human societies the world over. The IPCC released its Climate Change Report (February 2022) which stated that CO₂ emissions in 2019 were higher than at any time over the last 2 million years. The sea levels have risen faster in the 1900s than in any other century prior to that. Changes

due to global warming such as changes in the ice sheets, oceans and global sea levels are now irreversible. These developments have catastrophic consequences on human life and activities.

It is now evident that climate change is already affecting temperatures, hydrologic conditions, ecosystem functioning, and agricultural productivity in many regions. These impacts, combined with direct harms to people, property, and physical infrastructure, pose a serious threat to the enjoyment and exercise of human rights across the world. This is a global urgency and state need to speed up their efforts to both reduce the greenhouse gas emissions that contribute to global climate change and enact measures that reduce vulnerability and increase resilience to climate change impact.

Impact of Climate Change

Climate change is considered as a serious threat to ecosystem, biodiversity, and health, associated with alterations in the physical environment of the planet Earth. Climate change affects life around the globe and impacts plants and animals, with consequences for the survival of the species. In humans, climate change has multiple deleterious consequences affecting individual and communities. Climate change creates water and food insecurity, increased morbidity/mortality, and population movement, mostly vulnerable populations (e.g., children, elderly, indigenous, and poor) are disproportionately affected. All the changes in the physical planet Earth's environment affect the life of plants, animals, and humans; coral reefs, forests, and coastal human communities are particularly affected by climate change. Climate related changes cause mountain glaciers to melt and accelerates the rate of ice loss on Earth in Greenland and Antarctica. Lakes around the world are freezing less and for a shorter duration and in a few decades, thousands of lakes may lose their winter ice cover. The Nature for Climate Adaptation Initiative (NCAI) started by the International Institute for Sustainable Development (IISD) aims to enhance civil society organizations' capacity to implement nature-based climate solutions (NBCS) for adaptation that provide biodiversity and livelihood benefits to people of all genders and social groups in developing countries.

Planet Earth

Climate change triggers rise in sea levels due to warming or an increase in the mass of the water in the ocean mainly as a result of melting glaciers. Since 1900, global mean sea level has increased by approximately 0.20 meter. Scientists have worked out that over the last 25 years, the global mean sea level rose on average by 0.003 meter per year and by 2100, sea levels are predicted to rise between 0.40 and 1.50 meters. According to IPCC projections the coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, flooding, erosion, and saltwater intrusion, primarily due to sea level rise. This increase in sea-level may lead to disappearance of some islands and flooding with invasion of cities by sea water, leading to homelessness and population displacement. Besides, it may cause salination of freshwater supplies and loss of productive farmlands in the vicinity. The abundance of carbon dioxide in the atmosphere is also causing acidification of sea water which may alter marine ecosystems with severe damage to coral reefs, fish, and other aquatic species. Climate related change promotes more dangerous hurricanes and heavier rainstorms due to warmer ocean water temperature. The proportion of Category 4 and 5 hurricanes has increased at a rate of 25–30% per 1.0°C of global warming. Hurricane Katrina was one of the deadliest hurricanes in recent USA history. Climate change causes more frequent wildfires/ forest fires leading to deforestation, immense damage to property, multiple health problems, migration and death.

Climate change is responsible for more frequent and severe droughts (especially in subtropical regions), promoting the expansion of deserts. The average temperatures have risen because of climate change, the Earth's water cycle has sped up through an increase in the rate of evaporation from soil and transpiration from plants. An increase in evapotranspiration makes more water available in the air for precipitation, but contributes to drying over some land areas, leaving less moisture in the soil. This has led to water scarcity, loss of crops and livestock, increased food prices, misery, hunger, starvation, and migration of communities. The impact of climate change may vary depending on the type, location, intensity, and duration of the drought. Climate change is likely to affect people who live in areas that are vulnerable to coastal storms, drought, and sea level rise or people who live in poverty, older adults, and immigrant communities. Similarly, some types of professions and industries may face

considerable challenges from climate change, especially those closely linked to weather and climate, such as outdoor tourism, commerce, education and agriculture, are likely to be especially affected

Ecosystems and Natural Resources

Climate is an important environmental influence on ecosystems and changing climate affects these fragile ecosystems in a variety of ways. For instance, warming may force species to migrate to higher latitudes or higher elevations where temperatures are more conducive to their survival. Similarly, as sea level rises, saltwater intrusion into a freshwater system may force some key species to relocate or die, thus removing predators or prey that are critical in the existing food chain. According to IPCC projections, climate change will significantly reduce surface water and groundwater resources in most dry subtropical regions, thus intensifying competition for water among agriculture, ecosystems, settlements, industry, and energy production, and affecting regional water, energy, and food security. The water shortages leading to drought could be due to reduced rainfall, reduced snowpack resulting in less snowmelt supplying rivers and streams and relatively higher ambient temperatures, which may increase evaporation from surface water and soils.

Plant and Forest

Several climate change components viz., atmospheric carbon dioxide level, temperature, sea level, rainfall, weeds, and pests or microbes impact plant phenology, growth and their disease and pest dynamics. The increased land surface temperature with the resulting mild winters promotes pest proliferation, the invasion of farmlands by salty water, the wildfires, and the droughts compromise life of plants and lead to destruction of forests and damage to human agriculture. Plant growth, blooming, pollination, and fructification are impacted by climatic disturbances. Climate influences the structure and function of forest ecosystems- *Forest Dieback* and plays an essential role in forest health. A changing climate is a major environmental risk which may impact climate, biodiversity, water quality, food & fuel production, natural resources and livelihoods. The other related threats to forests, such as pest outbreaks, fires, human development, and drought could have serious socio-economic consequences. The productivity and distribution of forests could be affected by changes in temperature, precipitation and the amount of carbon dioxide in the air.

Climate Impacts on Agriculture and Food Security system

Agriculture and fisheries are highly dependent on the climate and increase in temperature and carbon dioxide (CO₂) may decrease or increase crop(s) yields in some regions. However, in order to augment crop productivity various inputs or factors such as nutrient levels, soil moisture, water availability, and other conditions should also be met. Changes in the frequency and severity of droughts and floods could pose challenges for farmers and threaten food safety. Meanwhile, warmer water temperatures are likely to cause the habitat ranges of many fish and shellfish species to shift, which could disrupt ecosystems. Overall, climate change could make it more difficult to grow crops, raise animals, and catch fish in the same ways and same places as was done in the past.

Climate change may affect the production of maize (corn) and wheat. Average global crop yields for maize, or corn, decrease to over 24% by late century, with the declines becoming apparent by 2030, as a result of high greenhouse gas emissions, according to a study by NASA. Cereal crop like wheat, in contrast may see an increase in crop yields by about 17%. (Jonas Jägermeyr et al. 2021). The change in yields is due to the projected increases in temperature, shifts in rainfall patterns and elevated surface carbon dioxide concentrations due to human-caused greenhouse gas emissions, making it more difficult to grow maize in the tropics and expanding wheat's growing areas.

A team of researchers led by the University of Minnesota's Institute on the Environment studied production pattern of 10 global crops (Maize (corn), rice, wheat, soybeans, oil palm, sugarcane, barley, rapeseed (canola), cassava and sorghum) and found that climate change has affected yields in many places. Not all of the changes are negative. Overall, climate change is reported to reduce global production of staples such as rice and wheat. Further when they translated crop yields into consumable calories – the actual food on people's plates – it was found that climate change is already shrinking food supplies, particularly in food-insecure developing countries. In India, around 36 million hectares(mha) agricultural area was affected due to hydro-meteorological calamities, including heavy rain and floods since 2016 – 6.65 mha in 2016, 5.08 mha in 2017, 1.70 mha in 2018, 11.42 mha in 2019, 6.65

mha in 2020 and 5.04 mha in 2021. While future yield estimates remain uncertain, these studies suggest that major breadbasket regions will face distinct anthropogenic climatic risks sooner than previously anticipated. According to United Nations Environment Program (UNEP, 2015) and other published reports, climate change is likely to have devastating impact on food security, around 10% of the projected impacts on food security under a 2°C warming scenario showed yield losses of more than 25% for the period 2030-2049, higher losses could be expected after 2050.

Hatfield et al (2014) and Ziska et al (2014) surmised the impact of climate change on crop productivity, (i) higher CO₂ levels can affect crop yields but elevated CO₂ levels can increase plant growth. However, other factors, such as changing temperatures, ozone, and water and nutrient constraints, may counteract these potential increases in yield. In case, if temperature exceeds a crop's optimal level, if sufficient water and nutrients are not available, yield increases may be reduced or reversed. Elevated CO₂ has been associated with reduced protein and nitrogen content in some plants, (ii) more extreme temperature and precipitation can prevent crops from growing and during extreme events, especially floods and droughts, can harm crops and reduce yields. (iii) Drought could become a major challenge in areas where rising summer temperatures cause soils to become drier, increased irrigation might be possible in some areas, in other places water supplies may also be reduced, leaving less water available for irrigation when more is needed, (iv) many weeds, pests, and fungi thrive under warmer temperatures, wetter climates, and increased CO₂ levels. The ranges and distribution of weeds and pests are likely to increase with climate change which may pose new problems for farmers' crops previously unexposed to these new species (v) Increased levels of atmospheric carbon dioxide is reported to reduce the nutritional value of food especially the contents of protein and essential minerals in most plant species, including wheat, soybeans, and rice. This direct effect of rising CO₂ on the nutritional value of crops represents a potential threat to human health, which is also threatened by increased pesticide use due to increased pest pressures and reductions in the efficacy of pesticides.

Changes in climate, especially heat waves could affect animals both directly and indirectly, it may disrupt feed and fodder supplies and can increase vulnerability to disease, reduce fertility, and reduce milk production. Increases in carbon dioxide (CO₂) may increase the productivity of pastures, but may also decrease their quality. The marine ecosystem is perturbed due to temperature rise and gradual acidification which is posing serious threat to shelled animals. The UN Food and Agriculture Organization announced that it will develop a plan by COP 28 to reduce emissions from food and agriculture systems in line with the goal of keeping temperatures from rising above 1.5°C. Food and Agriculture for Sustainable Transformation Initiative (FAST) and Agriculture Innovation Mission (AIM) for Climate are two new initiatives that have been launched to support climate-smart agriculture and food system innovation by 2030 and maintain a 1.5-degree pathway whilst supporting food and economic security.

Energy Scenario

Energy plays a crucial role in many aspects of our daily lives viz., use of electricity for lighting and cooling, fuel for transportation, heating, and cooking etc. Our energy production and use is interconnected with many other aspects of modern life, such as water consumption, use of goods and services, transportation, economic growth, land use, and population growth. Increases in ambient temperature is likely to increase our energy demand, as well as change our ability to produce electricity and deliver it reliably. New infrastructure investments may be necessary to meet increased energy demand, especially peak demand during heat waves. Climate change could affect the amount of water available to produce electricity, especially in those areas where water is already scarce, competition for water between energy production and other uses may increase.

Impact on Human Health

Climate change can have a wide range of adverse impacts on physical, mental, and community health. A warmer climate is expected to increase the risk of illnesses and death from extreme heat and poor air quality. These impacts will vary based on a where a person lives, how sensitive they are to health threats, how much they are exposed to climate change impacts, and how well they and their community are able to adapt to climate related change. With increase temperature, there are physiological reactions in humans creating risks for some organs and exposing individuals to increased morbidity and mortality (e.g., reduced performance and work productivity,

behavioral changes, heat exhaustion, heat stroke, respiratory failure, myocardial infarction, stroke, and death). In the USA, the annual heat-related death is approximately 1,500. The European heat wave during the summer of 2003 caused as many as 70,000 deaths. Climate change through variations in temperature, precipitation/humidity, wind, and solar radiation influences the spread of some infectious diseases since these variations may impact the survival, reproduction, and distribution of disease pathogens and vectors/hosts as well as their transmission environment. Several infectious diseases are involved including malaria, dengue, and Lyme disease. The air quality is appreciably impeded by climate change, warmer temperatures and shifting weather patterns can worsen air quality, which can lead to asthma attacks and other respiratory and cardiovascular health disorders. Wildfires, which are expected to continue to increase in number and severity as the climate changes, create smoke and other unhealthy air pollutants. Particulate Matter (PM) from wildfire smoke can often be carried very long distances by the wind, leading to adverse health effects, including lung cancer, chronic obstructive pulmonary disease (COPD), and cardiovascular disease. Scientists project that warmer temperatures from climate change will increase the frequency of days with unhealthy levels of ground-level ozone, a harmful air pollutant, and a component in smog. The higher concentrations of ozone due to climate change may result in tens to thousands of additional ozone-related illnesses and premature deaths per year by 2030 in many countries.

Impacts on Physical Infrastructure and Transportation

Climate change related phenomena viz., rising sea levels, coastal storms, heat stress, extreme precipitation, inland and coastal flooding, landslides, drought, increased aridity, water scarcity, and air pollution are likely to impact life in urban and rural areas. They will have a profound impacts on a broad spectrum of urban and rural public amenities, infrastructures, transportation and services, which are likely to exacerbate many existing stresses.

In 2008, the National Research Council's (NRC, 2008) Transportation Research Board conducted an in-depth study of the impacts of climate change on land, marine, and air transportation in the United States. Climate change is projected to increase the frequency and intensity of some extreme weather events. Specifically, heat waves will likely be more severe, sea level rise could amplify storm surges in coastal areas, and precipitation will likely be more intense. These changes could increase the risk of delays, disruptions, damage, and failure across our land-based, air, and marine transportation systems. The report recommends that state and local governments, as well as private infrastructure providers, incorporate climate change into long-term improvement plans, design, and operations and maintenance activities. Climate change will likely affect tourism and recreational activities in imminent future.

Impact On Water Resources and Quality

Warming temperatures, changes in precipitation and runoff, and sea level rise have affected and will likely continue to affect water supply and quality. Water resources are important to both society and ecosystems. Communities depend on a reliable and supply of potable water to sustain health. Good quality water is also required for agriculture. In addition, energy production, navigation, recreation, and manufacturing activities put pressure on water resources, and these stresses are likely to be exacerbated by climate change. Changes in water resources is affecting many vital sectors, and ecosystems. The climate change is expected to have severe impact on the hydrological cycle, water resource for drinking water, forest and ecosystems, losses of coastal wetlands and mangroves, food security, health and other related areas which is particularly disastrous for developing countries. It may further reduce the resilience of poor and vulnerable communities, which make up a sizable population of most cities in developing countries. The hydrological cycle is being modified in most agro-climatic regions and river basins by human activities such as land use change, water uses, inter-basin transfers, cropping pattern, irrigation and drainage. Many of the areas are getting transformed from safe area to critical and over exploited area with the fall in water table. It is projected that by 2050, up to 5.7 billion people could be living in areas where water is scarce for at least one month a year. This situation creates unprecedented competition for water, and it calls for much more efficient use and management of water to meet the growing demand. In view of this, sustainable management of surface and ground water and the supporting natural environment have gained considerable importance in recent years

Labour Losses due to Rising Heat

Working in hot and potentially humid conditions creates health and well-being risks that will increase as the planet warms. A report from the International Labour Organization (ILO) published in 2019 showed that Global warming is expected to result in an increase in work-related heat stress, damaging productivity and causing job and economic losses. The poorest countries will be worst affected. Projections based on a global temperature rise of 1.5°C by the end of this century suggest that in 2030, 2.2 per cent of total working hours worldwide will be lost because of higher temperatures, a loss equivalent to 80 million full-time jobs. This is equivalent to global economic losses of US\$2,400 billion. The sector expected to be worst affected, globally, is agriculture. 940 million people around the world work in the agricultural sector. It is projected to account for 60 per cent of global working hours lost due to heat stress by the year 2030. The construction sector will also be severely impacted with an estimated 19 per cent of global working hours lost by the same date. Other sectors especially at risk are environmental goods and services, refuse collection, emergency, repair work, transport, tourism, sports and some industrial sector.

A study, conducted by Luke Parsons et.al (2021)), at Duke's Nicholas School of the Environment projected that economic losses associated with this lost productivity could reach up to \$1.6 trillion (Rs 1.6 lakh crores) annually if warming exceeds an additional 2 degrees Celsius relative to the present. India showed the largest heat exposure impacts on heavy labour among South Asian countries (greater than 101 billion hours lost / year), despite its modest average per-capita labour losses (162 lost hours a person a year). The study projected that India, China, Pakistan and Indonesia where larger fractions of the population work outdoors will experience the biggest losses overall. Parson's analysis show that that if one can limit warming to within another degree of current levels, one can still avoid most worker productivity losses by moving heavy labour to the early morning hours. But if warming exceeds 1°C, that becomes much more difficult. It's a sliding curve, and gets exponentially worse as the temperature rises. Heat stress may also act as a push factor prompting agricultural workers to leave rural areas in search of better prospects in the cities or in other countries. Although various factors ultimately contribute to the decision to migrate, heat stress is increasingly becoming a driver of international migration. Higher levels of heat stress were associated with higher out-migration in recent years, suggesting households take climate conditions into account in their migration decisions (ILO,2019).

Climate Change and Human Rights

All human beings depend on the environment in which they live and therefore a safe, clean, healthy and sustainable environment is central to the full enjoyment of a wide range of human rights. This includes the rights to life, health, food, water and sanitation. Without a healthy environment, we are unable to fulfill our aspirations or even live at a level commensurate with minimum standards of human dignity. At the same time, protecting human rights helps to protect the environment. When people are able to learn about, and participate in, the decisions that affect them, they can help to ensure that those decisions respect their need for a sustainable environment. Human rights and the environment are intrinsically intertwined, a safe, clean, healthy and sustainable environment is essential in the enjoyment of our human rights; whilst polluted, hazardous and otherwise unhealthy environments potentially violate our human rights. Both gradual climate change and extreme weather events impact people and their human rights, especially those in the vulnerable areas which often involve the most susceptible people least equipped to deal with the climate related impacts. Climate change impacts, directly and indirectly, an array of internationally guaranteed human rights. States have an affirmative obligation to take effective measures to prevent and redress these climate impacts, and therefore, to mitigate climate change, and to ensure that all human beings have the necessary capacity to adapt to the climate crisis. In order to give climate justice to all, climate actions should be consistent with existing human rights agreements, obligations, standards and principles. It should be ensured that those who have contributed the least to climate change unjustly and who disproportionately suffer its harms must be meaningful participants or partners, and primary beneficiaries of climate action, and they must have access to effective remedies.

Human rights and climate change are linked in three key ways (i) Climate change has implications for the effective enjoyment of the full range of human rights, particularly for people living in situations of increased vulnerability; (ii) a failure to integrate human rights into climate action can undermine people's rights; and (iii) the integration of human rights into climate change policies can improve effectiveness and result in benefits for people and the planet. The Office of the High Commissioner for Human Rights (OHCHR) and the Human Rights Council (HRC) together worked to highlight the link between climate change and human rights and call for a

rights-based approach to guide global climate change policies and action. The HRC stresses the importance of addressing human rights in the context of discussions related to the United Nations Framework Convention on Climate Change (UNFCCC) and the 2030 Agenda for Sustainable Development. Climate change has profound impact on a wide variety of human rights, including the rights to life, self-determination, development, food, health, water and sanitation and housing. The human rights framework also requires that global efforts to mitigate and adapt to climate change should be guided by relevant human rights norms and principles including the rights to participation and information, transparency, accountability, equity, and nondiscrimination. In essence, climate change is a human rights problem and the human rights framework must be a part of the solution. Former High Commissioner for Human Rights, Mary Robinson, described climate change as *probably the greatest human rights challenge of the 21st century*. Recognizing the importance of human rights in this context, parties to the UNFCCC have agreed to *fully respect human rights in all climate change-related actions*. It is therefore necessary that a human rights-based approach (Androff, 2015, 2018) should be integrated in any climate change adaptation or mitigation programmes, such as the promotion of alternative energy sources, forest conservation or tree-planting projects, resettlement schemes and others. It was emphasized that human rights and social development are two necessary and symbiotic components to achieving a just society. Social rights are at the intersection of human rights and social development, and can be implemented through social planning and rights-based approaches. It should be ensured that the affected individuals and communities must participate, without discrimination, in the design and implementation of these projects. They must have access to due process and to remedy if their rights are violated. All efforts and initiatives by the UN based agencies and others should focus on inspiring immediate and right - based action to mitigate and adapt to the negative impacts of climate change.

Human Rights most Affected by Climate Change

(i) **The Right to Life:** According to the International Covenant on Civil and Political Rights (ICCPR) Article 6 *Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life*. All States therefore should be committed to respect, protect, promote, and fulfil the right to life. This entails, at the very least, that States should take effective measures against foreseeable and preventable loss of life including those caused due to climate change. Five million people die each year due to climate- or carbon-related causes, and mortality by 2030 could exceed 100 million people, according to a report from DARA, a nonprofit organization (Climate Vulnerability Forum) that works to improve aid to those affected by conflict and climate change and quantify the global cost of climate change and carbon use. According to their estimates, climate change and the carbon-based economy together cost the world more than \$1.2 trillion in 2010, or 1.6 percent of global GDP, because of the increased severity of natural disasters; environmental changes like desertification, permafrost melt, sea level rise and loss of biodiversity; heating and cooling costs; and declines in labor productivity.

The United Nations Climate Change Conference COP27 held at Sharm el-Sheikh (Egypt) lunched a five-year work program to promote climate technology solutions in developing countries. and agreed to provide “loss and damage” funding for vulnerable countries hit hard by climate disasters. The UN’s Intergovernmental Panel on Climate Change stressed that greenhouse gas emissions must decline 45% by 2030 to limit global warming to 1.5°C.

(ii) The Right to Development

According to UN Charter the *Right to development is an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized* (Article 1.1, Declaration on the Right to Development). The ICESCR and ICCPR emphasize that all people should “freely determine their political status and freely pursue their economic, social and cultural development”. It is therefore imperative that States should take necessary steps individually and collectively to guarantee all persons the ability to enjoy economic, social, cultural and political development. Climate change poses an existential threat to people’s enjoyment of their right to development. The IPCC observed that “limiting the effects of climate change is necessary to achieve sustainable development and equity, including poverty eradication. According to Former World Bank President, Jim Yong Kim *unless the world takes bold action now, a disastrously warming planet threatens to put prosperity out of reach of millions and roll back decades of development*.

The book *Climate Change and Human Development*, by Hannah Reid(2015) highlights the major issues across all sectors and all countries, and reveals that the livelihoods of the poorest are today being undermined by climate change. Further, at the same time the capacity not only to cope, but to build improved lives, resides within these communities, sometimes catalysed by the work of NGOs and other social organizations. The central conclusion, that both development and adaptation must focus on strengthening communities from the bottom up and build opportunities for participation in policy making, is an urgent message. It also shows how the poorest and most climate vulnerable communities are finding ways to adapt to uncertainty and build their resilience to climate risk. In the Sustainable Development Goals (SDGs) of UN 2030 (Goal 13) combating climate change has been recognized as instrumental to sustainable development, highlighting the importance of addressing climate change and its adverse effects to secure sustainable, inclusive development that benefits all communities.

(iii) **The Right to Food:** Hunger is the leading cause of death in the world and being aggravated by the climate change. Our planet has provided us with tremendous resources, but unequal access and inefficient handling leaves millions of people undernourished/malnourished. Promoting sustainable agriculture through modern agri and processing technologies and fair distribution systems can sustain the whole world's population and make sure that nobody will ever suffer from hunger in times to come. The right to food is enshrined in the Universal Declaration of Human Rights and the International Covenant for Economic, Social and Cultural Rights(ICESCR). The Article 11 which upholds the "fundamental right of everyone to be free from hunger" and calls upon States acting individually and through international co-operation, "to ensure an equitable distribution of world food supplies in relation to need." The World Bank has estimated that a 2°C increase in average global temperature (the proposed target for international climate mitigation efforts) would put "between 100 million and 400 million more people at risk of hunger and could result in over 3 million additional deaths from malnutrition each year. Many Projections show that the world is not on track to achieve Zero Hunger by 2030 and, despite some progress, most indicators are also not on track to meet global nutrition targets. The food security and nutritional status of the most vulnerable population groups is likely to deteriorate further due to the health and socio-economic impacts of the COVID-19 pandemic. A joint report published by the Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, UNICEF, the World Food Programme and the World Health Organization(2020) indicated almost 690 million people around the world went hungry in 2019. High costs and low affordability also mean billions cannot eat healthily or nutritiously, and the COVID-19 pandemic and its after effects are intensifying the vulnerabilities and inadequacies of global food systems. If recent trends continue, the **Zero Hunger** target of the Sustainable Development Goals will not be achieved by 2030.

Recent reports have indicated that food systems are also contributing up to one-third of greenhouse gas emissions, up to 80 per cent of biodiversity loss and use up to 70 per cent of freshwater. However, sustainable food production systems should be recognized as an essential solution to these existing challenges. It is possible to feed a growing global population while protecting our planet. According to FAO publication - *The State of Food Security and Nutrition in the World 2022* it is estimated that between 702 and 828 million people in the world (corresponding to 8.9 and 10.5 percent of the world population, respectively) faced hunger in 2021. hunger affected 46 million more people in 2021 compared to 2020, and a total of 150 million more people since 2019, prior to the COVID-19 pandemic. Updated projections of the number of undernourished people suggest that nearly 670 million people will still be undernourished in 2030 – 78 million more than in a scenario in which the pandemic had not occurred. Some of the measures to address this problem could be (i) improving agri-food systems *efficiency*, (ii) increasing the availability and reduce the cost of nutritious foods, thus increasing people's affordability and access to healthy diets; and (iii) provide strong incentives to reduce GHG emissions, adapt to climate change and manage natural resources *sustainably* under planetary boundaries.

(iv) **The Right to Water and Sanitation:** The United Nations General Assembly explicitly recognized the human right to water and sanitation (Resolution 64/292),and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights. The Resolution calls upon States and international organisations to provide financial resources, help capacity-building and technology transfer to all countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all. The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. In India, the constitutional right to access to clean drinking water can be drawn from the right to food, the right to clean environment and the right to health, all of which have been protected under the broad heading of the Right to Life, guaranteed under Article 21 of the Constitution. The United Nations World Water Development Report (UN-WWDR 2020) indicates that water availability will become more unreliable with

increased climate variability, aggravating the situation in water-stressed regions and generating similar problems in areas that have not yet been as severely affected. Water related disasters will become more frequent and severe. Food security, human health, urban and rural settlements, energy production, industrial development, economic growth, and thriving ecosystems are all water-dependent activities and thus vulnerable to the impacts of climate change. Extreme weather events are making water more scarce, more unpredictable, more polluted or all three. These impacts throughout the water cycle threaten sustainable development, biodiversity, and people's access to water and sanitation. According to the World Health Organization (WHO), between 50 and 100 litres of water per person per day are needed to ensure that most basic needs are met and few health concerns arise. The water source has to be within 1,000 metres of the home and collection time should not exceed 30 minutes. Nearly 884 million people or so people in the world live more than 1 kilometre from a water source, water use is often less than 5 litres a day of unsafe water. Unclean water and poor sanitation are the world's second biggest killer of children. By 2050, the number of people at risk of floods will increase from its current level of 1.2 billion to 1.6 billion. In the early to mid-2010s, 1.9 billion people, or 27% of the global population, lived in potential severely water-scarce areas. In 2050, this number will increase to 2.7 to 3.2 billion people. Findings from WHO and UN-Water's Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) report show that acceleration is needed in many countries to achieve the UN Sustainable Development Goal (SDG) 6 – water and sanitation for all by 2030, only 25% of countries are on track to achieve their national sanitation targets. Less than a third of countries reported to have sufficient human resources required to carry out key drinking-water, sanitation and hygiene (WASH) functions. Dr Tedros Adhanom Ghebreyesus, WHO Director-General remarked *We call on governments and development partners to strengthen WASH systems and dramatically increase investment to extend access to safely managed drinking water and sanitation services to all by 2030, beginning with the most vulnerable.* Sustainable Development Goal (SDG) 6 is to ensure the availability and sustainable management of water and sanitation for all by 2030. Achieving SDG 6 is integral to the success of the 2030 Agenda for Sustainable Development, which aims to end extreme poverty and protect the planet. Water resources management and water supply and sanitation services are currently underfinanced and in need of greater attention from governments. Sustainable water management will help society adapt to climate change by building resilience, protecting health and saving lives. It will also mitigate impact of climate change by protecting ecosystems and reducing carbon emissions from water and sanitation transportation and treatment.

(v) **The Right to Health:** The right to health is a fundamental part of our human rights and of our understanding of a life in dignity. The right to health means that governments must generate conditions in which everyone can be as healthy as possible. Such conditions range from ensuring availability of health services, healthy and safe working conditions, adequate housing and nutritious food. It means that acknowledging health as a human right recognizes a legal obligation on states to ensure access to timely, acceptable, and affordable health care. A rights-based approach to health requires that health policy and programmes prioritize the needs of those furthest behind first towards greater equity, a principle that has been echoed in the 2030 Agenda for Sustainable Development and Universal Health Coverage. Further this must be enjoyed without discrimination on the grounds of race, age, ethnicity or any other factor.

According to World Bank reports, climate change will cause health impacts which are likely to increase and get exacerbated by high rates of malnutrition, including potential increases in vector-borne diseases and heat-amplified levels of smog that could exacerbate respiratory disorders. A research from UNICEF (2022) indicates that 624 million children are exposed to one of three other high heat measures - high heat wave duration, high heat wave severity or extreme high temperatures. The report estimates that by 2050, all of the world's 2.02 billion children are expected to be exposed to high heatwave frequency, regardless of whether the world achieves a 'low greenhouse gas emission scenario' with an estimated 1.7 degrees of warming in 2050 or a 'very high greenhouse gas emission scenario' with an estimated 2.4 degrees of warming in 2050. UNICEF warns urgent action is needed to increase funding for adaptation to protect children and vulnerable communities from worsening heatwaves and other climate shocks. The IPCC pointed out that climate change is expected to lead to increases in ill-health in many regions and especially in developing countries with low income, as compared to a baseline without climate change.

The World Health Organization (WHO) and over 20 leaders from governments and international organizations agreed and called for action to increase climate resilience of health-care facilities and increase indoor air quality through sustainable energy. The Strategic Roadmap to promote healthier populations through clean and sustainable energy stresses on the following actions: (i) consider clean cooking and access to electricity in health-

care facilities(ii) dramatically increase public and private investments in electrifying health-care facilities and in clean cooking;(iii) provide the necessary human and financial resources to design and implement clean energy plans and sustainable delivery models tailored to the needs of health sector and households;(iv) develop tailored policy and financing schemes, able to unlock the potential of clean and sustainable energy solutions and to address the health sector needs;(v) increase cooperation between the energy and health sectors and collaboration with all relevant stakeholders; and(vi) facilitate collaboration between private, public, and non-governmental actors. WHO data show that almost all of the global population (99%) breathe air that exceeds WHO guideline limits and contains high levels of pollutants, with low- and middle-income countries suffering from the highest exposures. It is therefore the pressing duty of international, national, state or provincial, regional, city, and local governments to adopt and implement air quality and climate change policies that will achieve the WHO Ambient Air Quality Guideline values in their country/regions.

(vi) **The Right to Housing:** Not all people are able to enjoy this right, and over one billion people live in substandard housing and informal settlements. Every year, several million people lose their home and are displaced as a consequence of development projects, conflicts, natural disasters or the climate crisis. Climate induced disasters were the primary driver of internal displacement during the past decade, forcing an estimated 20 million people a year from their homes. Those living in homelessness or lacking access to resilient or secure housing are the most adversely affected, as they often live in areas that are vulnerable to floods, hurricanes and cyclones, storm surges, mudslides, earthquakes and tsunamis. Moreover, States taking disaster risk management measures often fail to consider their effects on vulnerable communities and their right to housing. The right to housing is the economic, social and cultural right to adequate housing and shelter. The right to housing under ICESCR include; availability of services, infrastructure, material and facilities; legal security of tenure; habitability; accessibility; affordability; location and cultural adequacy. Right to Adequate housing and Shelter is an extension of Right to Life in India and this is also a well-recognized and internationally accepted Human right. The Human Rights Council (resolution 43/14; June 2020) calls upon States “to take the right to adequate housing into account in strategies for adaptation to and mitigation of climate change” and “to work with affected communities and individuals to develop and promote environmentally sustainable and sound housing design, construction and maintenance to address the effects of climate change while ensuring the right to adequate housing.” The international community is required to respond urgently to the climate crisis while also ensuring access to sustainable housing, prioritizing those most in need.

(vii) **The Right to Education:** Education plays a key role in climate action, both in terms of raising awareness of the scale of the problem and in figuring out the best solutions. This is true for formal and informal education, and UN Climate Change understands the vital role education plays, through its Action for Climate Empowerment (ACE) which helps empower the public to engage in climate action through education and training. The Climate education should be imparted in such a way that people and communities are quipped with the knowledge, skills and attitude required to take action, live more sustainably, change patterns of consumption and production and participate effectively in policy-making to promote low-emission, climate-resilient societies and sustainable development. In 2020, the number of people displaced due to natural disasters and extreme weather events were 30.7 million (IDMCs, 2021). The catastrophic effects of climate change are no longer isolated emergencies but have become the new global norm. People displaced by the effects of climate change face significant vulnerabilities with regard to accessing education. Climate directly destroys schools and learning materials, saturated school capacity, destroys infrastructure, linguistic barriers, destroys livelihoods exacerbated poverty, and dropout, difficulties having past qualifications recognized, discrimination, and more. The role that climate change plays in driving disaster displacement is also often seen as a direct one and responsible for about 89 percent total displacement. The UNESCO Policy paper (2020) *The impact of climate displacement on the right to education* recommends the following action (a) Migration policies should include consideration for education. Emergency displacement and its negative consequences for education can be avoided with well-managed and planned migration (b) national education laws and policies must be designed to prepare education systems for mass upheaval (c) a better understanding is needed of the obstacles that climate displaced persons face in accessing quality, inclusive education, whether they are displaced internally, across borders or undergoing planned relocation (d) Urgent and effective action must be taken to ensure the provision of education in the disrupted circumstances and that education systems should be able to withstand the pressures of displacement and heightened mobility (e) International organizations, policymakers, civil society and other stakeholders must work together to limit the irreversible damage that will be inflicted if the right to education is not upheld in all displacement settings.

(viii)**The Rights of Future Generations:** The interlinked crises of climate change, environmental degradation, loss of biodiversity, and pollution violate the rights of countless people every day and threaten the effective enjoyment of human rights of future generations. Climate change is therefore a gigantic problem that's going to take all of us working together to solve and requires the cooperation of every nation and every citizen. Currently about 710 million children are currently living in countries at the highest risk of suffering the impact of the climate crisis. However, *every child* will inherit a planet with more frequent extreme weather events than ever before. By 2050, there could be 143 million more migrants due to the climate crisis. Extreme events, including wildfires, floods and hurricanes, have become a frightening new normal. Hotter temperatures, air pollution and violent storms are leading to immediate, life-threatening dangers for children, including difficulty in breathing, malnutrition and higher risk of infectious diseases. While climate change affects everyone, those who have contributed the least to the crisis—children, those in poverty, and future generations are the most affected.

The UNFCCC embeds intergenerational equity within the international climate change regime as a founding principle. Article 3 frames the concept in terms of the need to “*protect the climate system for the benefit of present and future generations of humankind*”, which is reinforced by the inclusion of sustainable development as a further core principle within the UNFCCC framework. The UN system has committed to take the following initial joint actions to advance the rights of future generations, especially climate action (a) Develop a “UN Common Narrative” on the rights of present and future generations to a healthy environment (b) Ensure rights-based environmental actions from within and across the UN system (c) Issue a joint pledge from heads of UN agencies to promote child and youth participation in decision-making at all levels. (d) Develop a system-wide approach to protection of Environmental Human Rights Defenders (e) Enhance partnership with National Human Rights Institutions.

Disclaimer: *This mini review is a compilation of recent information collated from different sources viz., research papers, books, reviews, news, websites and recent articles published on climate change and human rights. The information may be useful for the social science students, social workers & researchers working on climate change, human rights and sustainability. The author takes no responsibility for any omission or discrepancy in the content /information/data/views provided in the review; readers may refer to original articles for details.*

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