Eco. Env. & Cons. 28 (May Suppl. Issue) : 2022; pp. (S370-S376)
Copyright@ EM International
ISSN 0971–765X

DOI No.: http://doi.org/10.53550/EEC.2022.v28i03s.053

Climate change in India and the role of social workers

Sunil Choudhary

Udaipur School of Social Work
JRN Rajasthan Viyapeeth (Deemed to be University), Udaipur Rajasthan, 313 001, Rajasthan, India

(Received 3 October, 2021; Accepted 24 November, 2021)

ABSTRACT

Climate change, now a day is a big challenge for whole world. In India there are so many causal factors behind this and we people are responsible for that. Industrialization, urbanization population growth, technological advancement and many more factors are there to adversely affect the environment. At this juncture, the need of the hour is that professional social worker should come forward and should proactively perform the various roles to protect the environment.

Key worlds : *Climate change, Global warming, Causes, Social work interventions*

Introduction

Many regions in the world are experiencing striking change in their average temperatures across the world in recent years. Average surface temperature has increased globally since the last century. The warmest decade has been from 2011 to 2020 whereas the warmest year yet has been the year 2016 (Source: NASA/GISS). The coastal and tropical areas face cold temperatures, intensity and frequency of droughts increase and rainfall is sometimes scanty or excess. Activities of humans are largely responsible for this and climate change will alter their lives so much because of global warming that the mere existence of human beings will be at stake. Development, human health, climate change and globalization are nearly interconnected. Only serious and consistent efforts for mitigating them can avert further deterioration and alter current conditions.

Materials and Methods

Climate Change : Conceptual overwiev
According to National Aeronautics and Space Administration (NASA),

"*Climate change is a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass changes such as sea-level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events* (Kaddo JR, 2016)

As per Intergovernmental Panel on Climate Change (IPCC),

"*Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer* (Cumby T, 2016).

According to Environmental Protection Agency (EPA),

"*Global warming refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself*

(Associate Professor)

represents only one aspect of climate change (MEFCC, 2014).

Global warming and greenhouse gases

Global warming and climate change are the most significant challenges which mankind is facing as its effects can be felt on human rights also. It was once observed by the United Nations Human Right Council, "*Climate change poses immediate and far reaching threat to people and communities around the world and has implications for the full enjoyment of human rights* (Kemp and Palinkas, 2015).

Almost 75% of the solar energy produced is absorbed by the earth while the remaining energy goes back in the atmosphere. The solar energy absorbed makes the planet warm and habitable for the humans which would be otherwise too cold for human survival. Some of the solar energy which radiates back to the atmosphere is trapped by greenhouse gases most of which is carbon dioxide. Excessive increase in carbon dioxide in the atmosphere released due to multiple human activities is the cause of global warming. It is an increase in temperatures which causes discomforts among humans and also affects the climatic conditions and weather patterns. In other words, greenhouse gases are produced through absorptions of radiations by certain gases including carbon dioxide and clouds which warms the temperature. Variations are therefore witnessed in climatic patterns which lead to desertification, water scarcity, storms, cyclones and floods. Other changes include rising sea levels, melting glaciers, soil erosions, etc.

Greenhouse gases include nitrous oxide, chlorofluorocarbons (CFCs), carbon dioxide and methane. Ozone layer depletion is caused by the presence of bromine and chlorine in CFCs which increases the radiations of ultraviolet rays. While changes in natural weather contribute to gases, the majority of the emissions are due to human activities such as burning of forests, refrigeration, and industrial and vehicular emissions.

Evaluation of scientific data of the last 100 years or so indicated rise in surface air temperature leading to global warming in 100 years of around 0.6 degree Celsius. The estimates regarded the 20th century being the hottest considering the last 1000 years and 1990s was the warmest decade in the 20th century. With melting of glaciers and rapidly increasing global temperatures, rise in sea level is projected between 9 cm to 29 cm till 2030 and 28 cm to 96 cm till 2090 (Sondhi, Sherwani and Gupta, 2020).

Climate change is the change in weather distribution in a specific region or the whole earth over a time period. Several causes are attributed to climate change such as volcanic eruptions, motion of tectonic plates, and dissimilarity in the intensity of solar energy, etc. Scientists firmly believe that the majority of the variations in climate are due to human activities. Increase in the component of carbon dioxide in the air, deforestation, depleting fertility of the soil, cement manufacturing, fuel combustion are all examples of human activities which are the reasons behind climate change.

Nations around the world have been frequently persuaded, especially those which contribute the most towards polluting the air, to decrease their emissions for providing a better and clean environment to mankind. The nations do not seem to be willing to comply with the limitations and reduce the carbon emissions in order to achieve the progress. Per-capita emission is although too low in India but emission of Greenhouse Gases (GHGs) would increase to manifolds in future. The United Nations Framework Convention on Climate Change (UNFCC) has been signed by many countries for reducing GHGs but these are not enough for preventing the damage which is being done to the earth in the form of rising sea levels and global warming. The countries which have signed the convention have acceded to cooperate and promote public awareness and train the stakeholders to protect the planet from the effects of climate change and have pledged to participate in alleviate negative impacts of climate change.

Discussion

Indicators of Climate Change

Changes to the physical, biological and chemical processes of earth are clearly evident which are due to global warming and climate change which have increased the risk of illnesses, injuries and deaths from intense flood and storms, wildfires and heat waves. Climate change has put the global production of food at risk and even reduced the availability of water worldwide affecting its quality as well as access. There have been considerable shifts in the seasons, extreme weather conditions are experienced, glaciers are melting causing rise in sea levels, groundwater supply is affected, oceans are becom-

ing more acidic, droughts and floods are being experienced, and threat to animal as well human lives are becoming evident. In a nutshell, the impact of climate change is seen in all spheres of life.

Melting of Glaciers

The most sensitive signal of global warming are glaciers. The glaciers are melting faster than the normal rate as has been observed by the World Glacier Inventory which has been compiling the glacier melting and mass since 1970 around the world. It has been speculated that the melting of glaciers might lead to extreme water crises and result in severe scarcity of water for the future generations.

According to a report by the Intergovernmental Panel on Climate Change (IPCC), the Himalayan glaciers would disappear by 2035 if the glaciers melt with the current rate. Although it then has been claimed that there was a distortion of figure due to printing error but the environmentalists warn of a huge disaster for the population who are residing in the Himalayan region. Glacial lakes are swelling and are severely impacting the areas with disastrous flooding which has led to sweeping away of houses, bridges, roads and people. The Gomukh glacier is one of the largest in India which is the source of the Ganges river spreading over 260 square kilometers. But increased human activity by the travel enthusiasts and frequent mountaineering is resulting in reduced number of the tributaries to five from nine. Scientists have claimed that this reduction in tributaries has been experienced since the 1970s which has also doubled the melting rate of the glaciers.

Rise in Sea Levels

Sea levels are rising due to the serious effect of climate change. Global warming is leading to melting of ice caps at a rapid rate resulting in rising sea levels and severely risking the low lying areas and nations. Due to the rising sea levels, the regions near Indian Ocean, Mauritius, Egypt, The Netherlands and Bangladesh are under huge risk. Coastal regions of India low lying regions face the maximum risk especially in Maharashtra, Tamil Nadu, Odisha and Gujarat. These areas have experienced devastating natural calamities like Tsunami and Hudhud cyclone. This could lead to intrusion of saltwater affecting the supply of regular fresh water.

Acid Rains

Soil nutrients are washed away by the acid rains resulting in poisoning of soil and water pollution. They also impact the photosynthesis in plants, increase drought and insect infestation. The sources of water become acidic affecting the aquatic ecosystem. They also damage the metal structures and stones of buildings and automobiles ruining them to a great extent. Human beings are not directly affected by acid rain but the toxic substance gets into the water sources which pollute them and then it becomes dangerous for consumption by humans as well as animals. Human's respiratory system is hugely affected by the smog which is the result of a mixture of fog with these pollutants.

Ozone Layer Depletion

The effect of sunlight on oxygen leads to formation of ozone which is 20 to 25 kms above the earth's surface in the form of a layer. It is a severely poisonous and polluted gas which results in respiratory illnesses among human beings. The natural vegetation is also being affected by the ozone leading to deterioration of products. It protects the earth's surface from harmful radiations and ultraviolet rays of the sun. This layer is becoming thinner due to CFC emissions. The destruction of ozone layer poses humongous health risks such as cataracts and skin cancer. It also decreases the vegetation.

Causes of climate change

Various factors contribute to the problems associated with climate change. They are as follows -

➢ **Deforestation**

Many environmental, economic and social benefits are provided by forests. They also help in preventing climate change as the trees produce oxygen and consume large amounts of carbon dioxide which is the main cause behind increasing global warming. The more the trees, the better is the environment. But this has been largely disrupted by the practice of deforestation. Trees are cut due to a variety of reasons especially in the name of development. Deforestation not only leads to increase in the presence of toxic gases like carbon dioxide but also results in soil, wind and water erosions reducing the biotic potential of the land. Data valuation by the Ministry of Environment, Forest and Climate Change estimates that India has deflected around 1.5 million hectares of land ascribed to forests for development purposes since 1980.

➢ **Depletion of Ozone layer**

Ozone is a gas which is both man-made and natural. It shields the biotic life on the earth from the potential damage by the harmful infrared radiations and ultraviolet rays of the sun by forming a layer called Ozone layer is depleted with the increasing impurity in the atmosphere because of the release of repellants or dangerous gases from industries, refrigerators, air conditioners and exhaust pipes of vehicles which emit substances like hydrocarbons, sulphur oxide, nitrous oxide, dust, soots, smoke, carbon monoxide and chlorofluorocarbons (CFCs).

➢ **Concentration of Carbon Dioxide (CO_2)**

Natural processes like animal respiration, decay or burning of organic materials or plants, and eruption of volcanoes lead to release of CO_2 in the atmosphere. Activities of human beings like burning of wood products, fossil fuels and solid wastes for heating buildings, generating electricity and driving vehicles also lead to release of CO_2 in the atmosphere. Industrial revolution since the mid-1700s has risen the concentration of carbon dioxide. Rebecca Lindsey in her research article found out that the year 2019 recorded 409.8 ppm of global atmospheric carbon dioxide which was 2.5 ppm higher than 2018 while the increase was similar between 2017 and 2018. The global rate of growth of atmospheric carbon dioxide in the 1960s was approximately 0.6 ppm every year.

➢ **Greenhouse effect**

The capacity of gases like carbon dioxide, ozone, chlorofluorocarbons, perfluorocarbons, nitrous oxide, methane and water vapor to trap heat in the atmosphere emitted from the surface of earth so as to warm and insulate the planet in a layer or in a blanketing manner by greenhouse gases is known as greenhouse effect. Various inventions lead to concentration of these atmospheric gases including burning of fossil fuels, land clearing for developing buildings or carrying out agriculture, etc. which cause the climate of the earth to become unnaturally warmer. Greenhouse Gases (GHGs) occur both as a result of human activities as well as naturally. Water vapor is the most abundant greenhouse gas by far which gets to the atmospheres through water evaporation from lakes, rivers and oceans. Methane, ozone, nitrous oxide and carbon dioxide though occur naturally in the atmosphere, they are produced immensely as a result of human activities too. The amount of water vapor, on the other hand, is not affected directly by human activities.

➢ **Aerosols**

Aerosols are also called particulates which are airborne particles that scatter, absorb and reflect radiation into space. Particles, clouds and windblown dust are natural aerosols which are produced due to volcanic eruptions. Slash-and-burn farming and fossil fuels' burning are the human activities which contribute more aerosols in the atmosphere. They are not the greenhouse gases which trap the heat but they affect the heat energy which is radiated back to the space from the earth. Scientists believe that the aerosols which are dark in color have a warm effect while light-colored ones contribute to cooling.

Socio Economic Implications of climate change

India is facing a wide range of daunting social, political and economic challenges like decreased agricultural productivity, poor health standards and poverty, which are likely to be increased by the impacts of climate change. While there is uncertainty among experts on the impacts of climate change on India, it is believed to increase competition for already limited resources; increased risk of disruptive events like droughts, storms or floods; and greater stress on social, political and economic systems across the board. Decision makers in India are required to balance between combating poverty, sustaining growth, building capacity and social safety nets for dealing with climate change.

➢ **Poverty**

Poverty is the most pressing and severe challenge in India. Significant success has been achieved by India in tackling poverty. India's 60% population lived below poverty till 1980 which was cut to half with significant growth of the economy by mid-1990s. Although poverty reduction programs are the key to bring down poverty but rapid growth is necessary to sustain the status. Growth of India in per capita terms has been more than four percent since the late 1980s which was less than two percent between the years 1950 and 1980.

More than 400 million people still spend their day on less than a dollar despite considerable improvement in the status of poverty. Thus India has the largest number of people around the world who are living in poverty which will be increased signifi-

cantly with climate change. Huge burdens of agricultural disruptions are borne by the marginal farmers and landless workers. Poor people suffer from various disadvantages including dearth of alternative employment other than casual labor; insufficient training programs in services and organized industrial sectors for jobs at entry level. Poor populations are adversely impacted by natural calamities like floods, droughts and heavy rains as they are not able to protect themselves from the brunt of nature.

➢ **Inequality**

India is stratified economically and culturally which steals the attention from inequality in the international community. Distributive justice is rather less focused than growth in India. Climate change impacts are unequally distributed in India which might actually reduce inequities in the country. Shifts in the patterns of rain and increased temperatures may improve agricultural yields in those areas which were previously disadvantaged. Although optimistic outcomes are possible but the majority of the impacts of climate change exacerbate the inequities already existing in the country. The capacity of rich people to handle the challenges induced by climate change widens the gap between poor and rich. Adverse impacts of climate change are more likely to affect agriculture rather than industrial output exacerbating the inequality between rural and urban. Some regions will experience more challenges of climatic change which will increase cross-regional inequality. Poor coastal regions of Odisha experience disproportionate impact of flooding and states with lower per-capita income like Rajasthan and Uttar Pradesh face higher incidences of droughts.

➢ **Public Health**

Health outcomes and climate change share a complex relationship. If warmer regions experience rise in temperatures, more intense and long lasting heat waves are witnessed giving rise to incidences of heat strokes. Air pollution is worsened due to warmer climate and it increases the influence of airborne diseases. Droughts and floods might lead to unhygienic conditions and water contamination which increases the incidence of diseases like dysentery or malaria.

➢ **Agricultural Challenges**

Agriculture sector of India faces additional crises from the stress of climate change. Various portions of the agricultural sector are confined to inefficient, labor-intensive and marginally productive models which are not viable. Contribution of agriculture in India's GDP is less than 18% which is further declining rapidly. Population of nearly 70% resides in rural areas and around 65% are engaged in agriculture which indicates that the challenges to agriculture due to climate change will directly impact the majority of the population. With agriculture becoming more capital-intensive and difficult, small and marginal farmers will be stressed to trade their land; increase in economic inequality is likely to be seen and economic viability of mid-sized farms becomes less.

➢ **Food Security**

Productivity gains from the successful green revolution in India have helped India in achieving self-sufficiency in food grains which has been of great national pride. Impacts of climate change will pressurize India to make use of its comparative advantages and instead of focusing on self-sufficiency it needs to stress more on crop specialization and trading on international markets for maintaining food security. If this transition doesn't start early and attain success, India is likely to face acute food shortages once again because of decline and frequent disruptions in agricultural productivity due to climate change.

➢ **The Rural Labor Surplus**

With the occurrence of food security, Indian agriculture was faced with a major problem of determining the role of excess population of rural India which gave rise to intervention of services and industrial sectors. Agricultural employment needs to be balanced at high levels for keeping the migration to urban areas at a rate which the industries and services sector could accommodate. Therefore, rural labor's surplus has favored the persistence of traditional, small and labor-intensive farms. This results in putting a larger population of the area at risk of climate change; increasing their vulnerability to marginal disruption; discouraging use of more efficient solutions using technology for dealing with climatic constraints; and limiting creation of excess agricultural capacity for dealing with climatic constraints. Major floods and droughts which are extensive climate stresses could disrupt the structure of villages across entire areas of the country putting huge numbers of people at risk.

➢ **Energy Challenges**

The majority of energy needed by India comes from

fossil fuels which are going to make India the major subscriber to global warming due to increase in emissions from transportation, power generation and industry. Nearly 40% of the Indian population lives without access to electricity as the country remains severely under-electrified while another 20-40% live without regular and reliable access.

Climate change will affect the energy needs of India in many respects. Migration to urban areas and temperature increases can be anticipated to generate growing demand for electricity. Climate change would lower winter heating demand and boost summer cooling demand. Transmission and power generation efficiencies will be adversely affected by climate change according to some studies. Also mitigation policies of climate change like development of cleaner energy and caps on emissions could impose larger constraints on the growth of India's energy production.

➢ **Urban Challenges**

Cities of India will face growing challenges of climate change while the direct impacts won't be as disruptive for towns and cities as for the rural areas. Poor quality of air and overcrowding are severe problems in the cities of India and these roadblocks will be aggravated by climate change. Infrastructure in cities is overstressed and poorly developed. Many times makeshift and shanty urban dwellings where poor people reside are swept away or collapsed due to heavy rains and floods. Drinking water supply will be reduced due to shifts in rain patterns and glacial melting at the time when migration increases the demand of water in the cities. Urban systems like health, water, energy, housing and transportation will be overwhelmed by mass migration of rural population to the cities. Huge inflow of environmental refugees from rural areas to urban areas will also raise a serious challenge of employment. There could be serious problems of conflicts among rural migrants and already established urban residents especially on the issue of employment.

Social work intervention in dealing with climate change

Social workers have an important role to play in dealing with climate change as they have the right skills and compassion to deal with the issues which are dangerous for mankind.

Role of Social workers

There are 4 important roles identified for social workers to deal with the issues of climate change.

Researcher

Social workers conduct research and proficiently write about the environmental issues. They are contributing to the academic pool of eco-social work. Some of the research areas include ecological ethics, indigenous traditions, water, climate change, economic justice, energy and resources, poverty, addictions and consumerism.

Educator

As an educator, social workers bring the issues of climate change in their classrooms and discuss with the 'social workers-in-making'. By discussing creation and space, social work educators highlight the relationships among humans themselves and with nature. Until the environment in which we live isn't healthy, balance cannot be restored hence it is important to address the connection.

Clinician

Clinical social worker bring environmental perspective into their practice. They discussed the importance of engaging with the environment and reconnecting with their indigenous space. Engaging and discussing the environment is an imperative part of tradition hence it is an undetachable issue from the services of clinical social work. It is sometimes challenging but persistent efforts would mitigate the issues.

Community member

Social workers themselves are part of the community they are working in. They play an important role in taking action to tackle the environmental issues. Social workers find it difficult to separate their profession with their private selves. Their work extends from their paid roles to other responsibilities as well as along with social workers they are the members of the community too.

Dealing with climate change as a part of the social work mandate

It is important to voice concern against climate change issues as a social work mandate. Social workers are required to be at the forefront for advocating against climate change, helping others to re-

spond and adapt to social systems and be aware of environmental issues. It is impertinent to fit social work's ecosystem model in the larger frame of reference without which the main piece of the puzzle is missing.

Supporting oppressed, marginalized and vulnerable individuals and groups

Social workers have claimed that the issue of climate change has been created and distributed by the same economic and social forces which created marginalization and poverty, i.e. racism, capitalism, etc. The majority of the people hurt by the aftermaths of climate change belong to impoverished, marginalized and vulnerable communities with which social workers deal which makes it an issue to be fought by social workers. The marginalized people are supported by the social workers for making sure that their needs is met and that their voices are heard.

Supporting the wellbeing of communities, families and individuals

Indigenous ways of seeing, doing, being and knowing help in achieving balance, health and harmony, supporting healing of others and finding wholeness. Healthy environment leads to healthy communities, families and individuals. Social workers support people in coping with the aftermaths of climate change.

Supporting social justice and social transformation

Social workers support people in seeking environmental and social justice. They transform the communities and systems to make them more just seeking environmental and social justice.

3. Social workers have skills that can help deal with environmental issues like climate change

Social workers are equipped with a unique set of skills for dealing with the issues of climate change through which they can contribute to mitigating climate change challenges.

a) Social workers have the skill to use person--in-environment perspective in which individuals are focused in their natural environment
b) Skills of using lens of social justice especially towards power, wealth distribution and inequalities
c) Social workers use unique skills of crisis counseling to support and manage people
d) Social workers have community organizing skills as they are very good at connecting and talking to people, listening to their stories and experiences and helping the individuals navigate through the process.
e) Social workers have the skill to simplify the complex policies and make people understand about their important sections and parts.

Results and Conclusion

Climate change and global warming are not just local issues which could be resolved at the local level. These are international issues which are affecting everyone and lead to vital health implications to the entire mankind. It is extremely imperative to educate and aware people on this issue as it is a man-made crisis and hence it is the duty of human beings to undo the damage they have created. Development improves the overall standards of living but it also needs to be sustained for the present and future generations as well. It is important to develop green initiatives and bring a profound shift in the patterns of consumption and production. Keeping in mind the course of action being taken on global level for climate change, it is required for India too to develop a policy for sustaining the national resources for its future generations.

References

CENTRA Technology, Inc. and Scitor Corporation. (2020). India: The Impact of Climate Change to 2030 Geopolitical Implications. National Intelligence Council.

Cumby, T. 2016. Climate change and social work: Our roles and barriers to action. Theses and Dissertations (Comprehensive). 1828. https://scholars.wlu.ca/etd/1828

Kaddo, J.R. 2016. Climate Change: Causes, Effects, and Solutions. *A with Honors Projects*. 164.http://spark.parkland.edu/ah/164

Kemp, S.P. and Palinkas, L.A. 2015. Strengthening the Social Response to the Human Impacts of Environmental Change. American Academy of Social Work and Social Welfare. Working Paper Number 5.

Ministry of Environment, Forests and Climate Change. (2014). India's Progress in Combating Climate Change. Government of India. Briefing Paper for UNFCC COP 20 Lima, Peru.

Sondhi, V.K., Sherwani, F. and Gupta, A. 2020. India: Climate Change – Indian Law and Judiciary. L & L Partners. Retrieved from https://www.mondaq.com/india/clean-air-pollution/945304/climate-change—indian-law-and-judiciary