

Role of Social Support System in ensuring Good Health and Wellbeing

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Abstract

With the emerging global crisis of climate change outbreak of COVID-19, it is imperative that how significant it is to maintain the balance between ecology, environment, and human life. The paper demonstrates the significant impact of climate change on the environment and health. A collective initiative by all the stakeholders is essential to ensure health security and safeguard society against natural and health catastrophes. In addition, United Nation's sustainable development goal (SDG 3) regarding good health and well-being focuses on various aspects of healthy living.

In this context, by incorporating a resilient health infrastructure and ensuring health disaster preparedness, SDG 3 can be accomplished. The paper presents an integrated framework of local technology, a natural support system, and a decentralized system to unfold all local challenges related to health disasters as well as natural disasters. The paper finally highlights the relevance and significance of social support systems in strengthening good health and well-being. Thus, the role of channels such as radio, TV, and social media in facilitating information dissemination has been emphasized in this paper.

Keywords: Social Support System, natural support system, media channels, good health, well-being, health disaster, natural disaster.

1. Introduction

Human activities in the form of production and consumption have proven to be extremely detrimental to the ecological balance. The burning of fossil fuels has subsequently released excessive quantities of carbon dioxide and other greenhouse gases, thus trapping additional heat in the

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lower atmosphere and affecting global climate change (World Health Organization, 2018). The world has warmed by approximately 0.85 degrees Celsius in the last 130 years, with each last three decades successively warmer than any proceeding decade since 1850 (World Health Organization, 2018).

Several hazards, such as floods and drought conditions, have been witnessed in the US over the last decades in the United States, resulting in poor air quality and affecting indoor air quality (Centre for Disease Control and Prevention, 2014). Further, the potential increase of harmful vectors, an organism such as fleas, ticks, or mosquitos, etc., that can transmit a pathogen or infectious agent from one host to another, can result in several health risks (Centre for Disease Control and Prevention, 2014).

There is enough evidence to prove that human activities of production and consumption have resulted in tremendous damage to the environment we live in. Both the processes of production and consumption, require more and more use of natural resources. Natural resources are characterized based on renewability, food and forests replenish themselves naturally (Natural Resource Sustainable Development). However, these are also susceptible to depletion owing to over-use and over-exploitation when the rate of consumption exceeds the rate of replenishment or recovery. Non-renewable resources are exhaustible and are subject to depletion, such as minerals and fossil fuels. Excessive emission of carbon dioxide has subsequently led to the most severe global challenge of climate change, also referred to as global warming.

A minimal increase in Earth's temperature owing to climate change can result in severe consequences. The Earth's temperature is expected to rise as much as 1.1 degrees Celsius to 5.4 degrees Celsius, according to the US-based National Oceanic and Atmospheric Administration (National Oceanic and Atmospheric Administration). A substantial rise in temperatures has further resulted in stronger and more frequent storms, and additional rainfall, leading to flooding and other damage. An increase in the incidence of wildfires also threatens habitats, homes, and lives. Heatwaves contribute to human deaths and other consequences.

The soil moisture dynamics as a consequence of climate change impact vegetation substantially since the plant carbon assimilation significantly depends not only on the total rainfall during the growing season but also

on the intermittency and magnitude of the rainfall (Porporato, 2004). It is predicted that between 2030 and 2050, climate change is expected to cause approximately 250000 additional deaths per year from malnutrition, malaria, diarrhoea, and heat stress (World Health Organization, 2018). The countries with weak health infrastructure, mainly developing countries, will be least able to cope without the assistance to prepare and respond (World Health Organization, 2018). According to the World Health Organization, the direct damage costs to health, excluding the costs in health-determining sectors such as agriculture and water and sanitation, are estimated to be between USD 2-4 billion per year by 2030.

Against the backdrop of inherent interlinkages between the environment, ecology, and climate change, the present study is an attempt to comprehend and highlight the role of human activity in disrupting the ecological balance. By deploying a schematic framework, the study visualizes the relationship and connections between climate change, environmental degradation, ecological imbalance, and health crises. Considering human activity in the form of production and consumption at the centre stage, the paper unfolds two methods of resolving the challenge of ecological imbalance that affects the human process of production and consumption. By deploying energy-efficient and adopting a sustainable consumption path, humans would be able to sustain the ecological balance. Finally, the paper also recommends the use of technology and the role of the state that would prove to be instrumental in mitigating the health crises associated with climate change. The social support system, natural support system, and media significantly affect the building of a health-resilient infrastructure and health security.

The paper is organized under various sections. Apart from the introduction section, Section 2 describes a detailed account of the literature review. Section 3 discusses the linkages between human activity, ecology, environment, health, and climate change. Section 4 deals with empowering the social support system for unfolding local challenges. Section 5 presents an integrated framework for resolving climate change and health crises. The paper concludes and specifies policy recommendations in section 6.

2. Literature Review

The entire journey of health risk originates from human activity. The unprecedented activities of production and consumption lead to the accumulation of harmful greenhouse gas emissions in the atmosphere. As

these toxic gases accumulate, the Earth's temperature begins to increase. It is reported that the world has warmed by approximately 0.85 degrees Celsius in the last 130 years (World Health Organization, 2018).

An ecosystem is mainly a physical environment along with the organisms inhabiting that space as a mountain meadow, a farm pond, and a forest are all examples of ecosystems (Nature Education). There are unique processes and sequences of events being followed in an ecosystem. The activities and these processes are through days, seasons, and even years. Birth, growth, reproduction, and death are specific processes being followed in ecosystems, and there are consequent interactions between various species and geographical environments (Landis et al., 2003). (Sharma et.al, 2017) evaluate the health impact due to air pollution in East Delhi and conclude that a small reduction in the level of air pollution would reduce the expenditure by individuals on mitigating and averting activities due to air pollution. (Sharma et al. 2017)¹ signify the role played by habits and nutrition status of individuals in affecting the number of sick days of individuals.

As a consequence of human activity, several chemicals and harmful gases are released into the environment leading to adverse ecological effects. These effects are both long-term and short-term, disrupting the systems and processes of ecosystems. Several natural disasters such as drought, fire, flood, and species migration are some of the severe repercussions of environmental degradation on ecosystems.

Topsoil erosion is a naturally occurring process that affects landforms (Ministry of Agriculture, Food and Rural Affairs). Owing to soil erosion, topsoil is high in organic matter that is relocated elsewhere, filling in drainage channels and reducing the productivity of crops, aggravating pollution of watercourses, wetlands, and lakes. Soil erosion is a gradual process and it can even take place through the wind. Soil particles move in three ways, through suspension, saltation, and surface creep. Now, the emission of greenhouse gases increases temperature and precipitation. Further, moisture availability not only affects precipitation but also evapotranspiration (Nearing et al. 2018). When both temperature and precipitation increase, the effective precipitation would result in runoff and

¹The study was undertaken by the students of Daulat Ram College under the guidance of Prof. M.N. Murty, Institute of Economic Growth, New Delhi.

soil erosion on one hand but at the same time yield vegetation cover. Soil erosion reduces moisture storage capacity and affects crop production.

On the other side, solar ultraviolet radiation, developed over the past two decades, results in a reduction in productivity in many plant species (Soil Conservation Society of India). Moreover, ultraviolet rays have an inhibitory effect on decomposition processes (Formánek et al. 2014). The substantial increase in CO₂ concentration reduces both plant and microbial competitiveness for soluble soil (Formánek et al. 2014). Consequently, there is a significant loss or decline of forests due to air pollution and acid deposition, loss of fish production and timber growth, nutrient loss, and the impact of DDT on eagles and endangered species (Extension Toxicology Network). The inherent interlinkages between various species and communities (food webs) may be eliminated and disrupted as a consequence of the environmental impact of climate change (United States Environmental Protection Agency).

Further, the unusual temperature and moisture conditions may be extremely harmful to sustaining the ecological balance. Thus, ecological losses may further result in the socio-economic and political transition of human development. Thus, ecological losses may further result in the socio-economic and political transition of human development. Appendix Table 1 assimilates the environmental as well as health disasters in the last fifteen years that provide profound evidence of the impact of climate change not only on the environment but also on health. Man's way of living has phenomenally disrupted the inherent ecological balance, which has resulted in the catastrophic impact of climate change on the ecology and the environment.

Human activity and its consequent processes or modes of production and consumption have been identified as the core antecedent of disrupting the ecological balance. The strong linkages between human activity, ecology, environment, and climate change have resulted in health disasters or health risks. There is enough evidence to prove that if humans have to live on Earth, then life should be effectively based on a systematic alliance between each ecological component. In the history of pandemics, three of the deadliest pandemics were caused by the same bacteria named *Yersinia pestis* (Frith, J., 2012). The Black Death is believed to be the birth giver to quarantine. The Black Death hit Europe in 1347 and claimed the lives of over 400 million people within four years was astonishing (DeLeo & Hinnebusch, 2005). The London outbreak of the Plague in 1665 was the

worst of the century's significant outbreak, which took a toll of almost 1, 00, 000 lives in just seven months. Smallpox was a devastating outbreak that killed 3 out of 10 infected people in Europe during the 15th century (History of Pandemics). Smallpox was the first disease for which a vaccine was invented. In 1918, the world was again hit by the Influenza H1N1 virus, giving rise to the Spanish Flu. It infected around 500 million people which accounts for one-third population of the world (Centers for Disease Control and Prevention). Recently a decade ago, the world experienced Swine Flu, another variant of the H1N1 virus, which was declared as a pandemic by WHO.

It is also observed that pandemics have resulted in disruption of production and consumption and other socio-economic implications (Freire-Gonzalez, J., 2007). It is critical to observe the positive impact of improvement in the environment and ecology can affect human activity positively. However, the rebound effect has been analyzed by several studies. Sweden demonstrated a strong environmental rebound effect associated with ICT use, specifically related to energy use and total material footprints (Joyce et al., 2019). COVID-19 has significantly improved environmental quality regarding carbon emissions, air quality, and biodiversity loss (Saadat et al., 2020). Other researchers contend that improvement in the quality of the environment will not have a long-lasting impact (McCloskey and Heymann, 2020).

Humans live in a distinct socio-economic and political network. The systems adopted by the development processes across nations have to address inherent harmony and, ultimately, ecological sustainability. The development process adopted in the prior era has witnessed failure on the grounds of disrupting ecological and environmental harmony. There is a substantial need to revisit the process of development on account of maintaining the ecological balance. Nature teaches a unique way of living that is sustainable from the prism of ecology and the environment. As a result, the paper attempts to examine natural support systems and solutions originating from human activity in addressing the imbalance on account of the developmental process.

3. Impact of Human Activity on Ecology, Environment, Climate Change, and Health

An ecosystem, defined as a community of living organisms in conjunction with non-living components of their environment, constitutes the real world in which we live. Human life is thus placed at the heart of the ecosystem (Conserve Energy Future). Human beings, species, communities, and the ecosystem constitute a branch of study called ecology (Environment and Ecology).

While the environment relates to the surroundings we live in, comprising physical and biological components, it is this environment that determines the climate and weather around us. Ecology helps us understand how the world where we live works. It enables us to comprehend the interdependence of humans and other natural environments. It provides us with sufficient evidence of how human activity results in detrimental consequences for the environment around us.

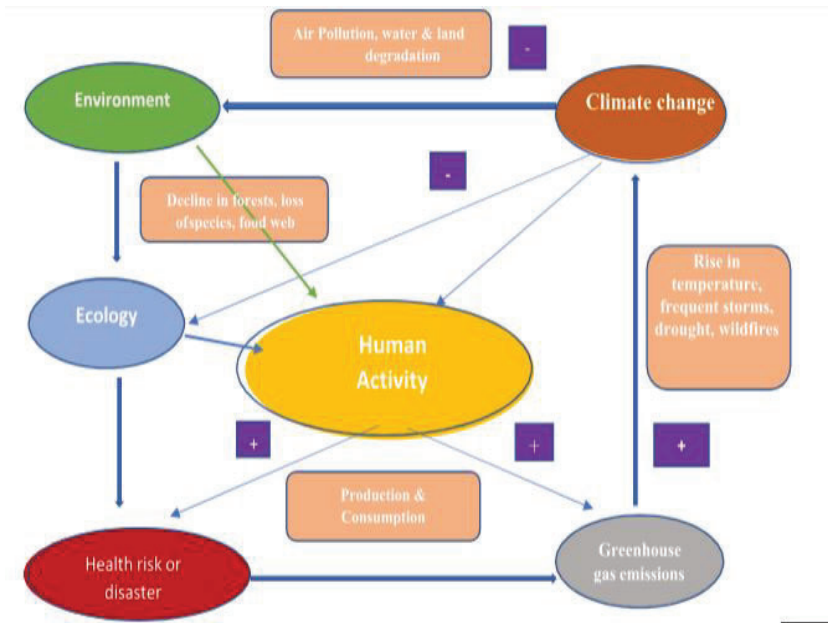


Figure 1: A schematic representation of interlinkages and interplay of factors between ecology, environment, and health risk due to human activity

Figure 1 depicts the linkages between ecology, environment, health risk, and human activity. It is evident in the schematic representation that it is human activity that is responsible for greenhouse gas emissions and health disasters through the vicious cycle depicted in Figure 1.

4. Empowering Social Support System: use of Indigenous Technologies

Both production and consumption as part of human activity need to be regulated and controlled as they have severe detrimental effects on climate change. Production activities require inputs like fuel, which lead to greenhouse gas emissions, while consumption activities comprise the lifestyle adopted by individuals, communities, and social systems. Given the urgent need to mitigate climate change, it is essential to recognize the importance of re-evaluating both production and consumption processes within the policy framework designed to address this challenge and ecological imbalance. The large-scale deployment of renewable energy sources, such as wind and biomass, along with favouring indigenous energy-efficient local production methods, can efficiently address the challenge of sustainable production.

However, many regions face technological constraints related to the availability of innovative technological know-how, natural resource limitations, and sometimes financial constraints. In this context, the role of the natural support system becomes crucial, as natural systems, including local resources, people, and the environment, can help build local mechanisms to address inefficiencies and obstacles.

When addressing the consumption aspect of human activity, it is crucial to reconsider the lifestyle patterns adopted by humans. A life based on simplicity, minimalism, and an environmentally friendly outlook can help mitigate the effects of climate change. Mahatma Gandhi's philosophy, "*There is sufficiency in the world for man's need but not for man's greed,*" should not be forgotten but should be implemented in all actions and deeds.

To achieve the above strategy, the government (state) can play a significant role by using its instruments of appropriate taxes and levies to reduce excessive consumption of non-essential and extravagant goods. A well-designed policy and consumption tax would be extremely useful in promoting a minimal consumption economy. Additional measures such as

environmental taxation and resource usage restrictions can help achieve sustainability targets (Freire-Gonzalez, J., 2007).

Health is a public good and is incorporated into public health services. It becomes imperative for the state to provide health security and public health services. Several health hazards, such as malaria, Ebola Virus Disease, SARS, etc., have highlighted the government's role in controlling health risks and hazards. Health, a crucial component of human capital, must be prioritised as the fundamental infrastructure necessary for economic growth and ecological sustainability.

4.1 Natural Support System

The natural support system involves members, friends, co-workers, neighbours, and acquaintances. Such a system empowers communities and strengthens them by providing facilities and services in times of need or emergencies. It is a type of informal community relationship, where services and help are provided without payment, enhancing the quality and security of people's lives. Several attributes help in developing a natural support system, such as communication, persistence, and knowing the individuals around.

4.2 Role of Media in Sustainable Development Goals

Media, in general, plays a critical role in the development agenda. Current public debates, sensitization programs conducted by government and non-government entities, and various social initiatives undertaken for social causes all rely on the media to mobilize people. This role is especially vital during health pandemics like the COVID-19 pandemic. Sustainable Development Goal SDG 3 aims to achieve good health and well-being and is also promoted through media channels.

During the COVID-19 pandemic, all forms of media, including print, electronic, and social media, played a crucial role in disseminating information about the pandemic's situation, lockdown measures, helpline numbers, healthcare emergencies, hospitals, and more. The media efficiently shared information to ensure the convenience, security, and safety of the public during the pandemic. Thus, the ethical use of media to protect the lives of a larger community is one of the most productive and efficient contributions to saving humanity.

5. Unfolding the Challenges of Climate Change and Health Crisis: An Integrated Framework

The challenges of climate change and health crises directly affect individuals across society. Since these challenges are universal, they should be addressed with a focus on individuals and local communities. The schematic representation in Figure 2 clearly illustrates the role of both central and state governments in addressing local health and natural disaster challenges by using local technology and empowering local communities.

It is the state's responsibility to maintain the inherent balance between ecology, environment, health, and human activity. The impact of climate change is directly observed in ecology, involving natural resources, humans, and other species. Natural disasters resulting from climate change affect different regions in various ways. Therefore, it is essential to implement local solutions based on the extent and type of impact experienced in each region. This highlights the role of local bodies and communities in disaster preparedness and management. In this context, the study proposes a decentralized management system to provide sustainable pathways for disaster management and health security efforts.

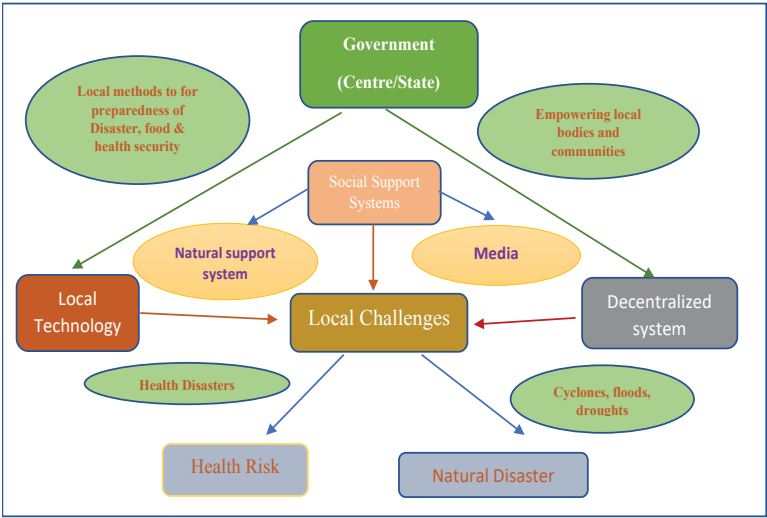


Figure 2: A schematic representation of the role of Government (Centre/State), local technology, and a decentralised system

A health catastrophe like the COVID-19 pandemic has underscored the significance of the natural support system, defined as a relationship with family members, friends, co-workers, neighbours, and acquaintances. This relationship is distinct from formal service providers such as counsellors, therapists, line staff, and care managers. The natural support system is reciprocal, involving mutual assistance. It helps foster a sense of belonging, dignity, and self-esteem. Empowering the natural support system promotes independence and growth while ensuring emotional security, a crucial component of overall well-being. Building a natural support system can be achieved through various methods, including participating in community activities and projects, joining groups, and volunteering.

6. Conclusion and Policy Recommendations

Climate change, as a consequence of human activities in production and consumption, has emerged as one of the most significant challenges facing humankind. A substantial increase in temperatures has led to stronger and more frequent storms, increased rainfall resulting in flooding and other damage, a rise in wildfires threatening habitats, homes, and lives, and heatwaves contributing to human deaths and other adverse consequences. However, the debate on climate change often lacks consensus on the recent changes attributed to human activities that have had a detrimental impact on Earth's climate and temperature.

Local techniques for addressing both health and natural disasters have proven to be effective methods for tackling local challenges that affect local inhabitants. Therefore, it is essential to strengthen and support local communities in resolving their unique issues by utilizing local resources and techniques. This paper highlights the role of the social support system, which includes the natural support system, and the role of the media in ensuring resilient health security.

Ultimately, by empowering the natural support system, local communities, and ethical use of media, the challenges of natural and health disasters could be encountered more efficiently. In addition, a natural support system provides emotional security, a crucial component of overall individual well-being, as specified in Sustainable Development Goal (SDG) 3 regarding good health and well-being.

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APPENDIX

Table 1: Compilation of environmental and health hazards

Environmental and Health Hazards due to Climate Change				
Sno.	Environmental Catastrophe	Year	Place	Description
1	Hurricane Maria	2017	Dominica, St Croix, and Puerto Rico	3057 fatalities Wind speed of 280kmph
2	Gujrat Earthquake	2001	Gujrat, India	Intensity of 7.7
3	Haiti Earthquake	2010	Haiti	Intensity of 7.0
4	Mumbai Cyclone (Nisarg)	2020	Mumbai, India	Windspeed of 120kmph
5	West Bengal Cyclone (Amphan Cyclone)	2020	India and Bangladesh	Windspeed of 240kmph
6	Kerala Floods	2018	India	More than 450 fatalities Loss of US\$ 5.6 billion
7	Cyclone Fani	2019	India (Odisha, Andhra Pradesh), Sri Lanka, Bhutan, Bangladesh	Windspeed of 250kmph 89 fatalities Loss of US\$8.1 billion
8	Gujrat Floods	2017	Gujrat, India	More than 225 deaths Caused due to heavy rain
9	Famine in Somalia	2011-12	Somalia	Affected 3.1 million people. Occurred due to crop failure.
10	Indian Ocean Earthquake and Tsunami	2004	Banda Ache, Indonesia	It was an undersea megathrust earthquake. Loss of over 1500 crore US\$. More than 2,27,000 deaths.
Sno.	Health Hazards	Year	Place	Description
1	Chicangunya	1952 (1st outbrea	Southern Tanzania	Viral infection transmitted due to mosquitoes.

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2	Crimean-Congo haemorrhagic fever	1944	Crimea	Viral fever. Fatality rate of up to 40%. No vaccine available neither for animals nor for humans.
3	Ebola Virus Disease	2014-16	Africa	Virus is transmitted through wild animals to humans. Average case fatality rate is 50%.
4	Hendra virus infection	1994	Australia	Fatal disease in horses and humans. There is a registered Hendra animal vaccine.
5	Marburg Virus Disease (MVD)	2008	Uganda	Fatality rate of around 50%.
6	Yellow Fever	1793	Philadelphia	Viral Infection. No specific treatment exists.
7	SARS	2002	China	A contagious and sometimes fatal respiratory illness caused by a coronavirus.
8	The Great Plague	1665	London	Took lives of over 75000 people. Caused by a bacterium.
9	Nipah Outbreak (1 st)	1999	Malaysia	Viral Infection. Only supportive care is existing as a treatment.
10	The Middle East Respiratory Syndrome	2012	Saudi Arabia	It is a viral infection caused by a coronavirus. It is a contagious, sometimes fatal respiratory illness.

Source: World Health Organization (WHO)