

**IMPACT OF CLIMATE CHANGE ON FOOD SECURITY: A LEGAL DISCOURSE IN
IMPROVING ENVIRONMENTAL INTEGRITY**

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Abstract

Climate change has an effect on every aspect of our lives. Our ecosystems suffer biodiversity and habitat loss and various human systems like health, fresh water, agriculture, etc. is getting negatively impacted. Climate change also challenges us to rethink our urban systems and the way we do business. Global warming refers to the overall warming of entire surface of the earth and climate change refers to changes in climate characteristics, including temperature, humidity, rainfall, wind and severe weather events over long term of periods. To overcome the problem, we have number of Laws International and National but still the laws are becoming less effective or are not sufficient to meet the high alert of the climate change. Especially it is in case of Food Security. Through research, this article examines the need to emphasis on food security in the world along with the international and national framework. It shows that the dynamic improvement is to be done in the work culture all over the world. On the basis of research, this paper explains the climate change, right to food and its interrelation. It discusses the effect of climate change on food security. It discusses mitigation and adaptation in this regard. It elucidates the role of local governance in aiding to meet the challenge of climate change through the laws existing and laws not in existence in the world. It will also emphasise on the role played by various stakeholders in answering the climate change issues pertaining to food security. It concludes with the radical changes which are in the process occurring due to such activism taking place through various stakeholders and the administration machineries. It ultimately contributes not only in improving environmental integrity affecting climate change but also towards the future aims and objectives provided under several national and international instruments dealing with the climate change in context with Food Security.

Keywords: climate change, food security, right to food, international laws, Indian laws, Administration mechanism

Introduction

UN-Secretary-General Ban Ki-moon has called climate change the "defining challenge of our time" (Ban Ki-moon, 2008) and in many countries the impacts of it are already felt. Humanity lives in two realities. The abiding certainty is that of the earth, the planet is independent of man and his works; the other reality is the transient reality which is that of the world, is a conception of the human mind. The earth and its biosphere form a magnificent amalgamation of multifarious collaborative systems within structures, organic and inorganic, animate and inanimate (Lynton Keith Caldwell, 1991).

Climate Change

It is important to understand the difference between "weather" and "climate". What is happening in the atmosphere at any given time is considered "weather" (including e.g. wind speed and direction, precipitation, barometric pressure, temperature, and relative humidity). Weather changes in the short term (e.g. daily, weekly, monthly). Climate is average weather and occurs over long time frames (e.g. 30 years). A general misunderstanding between weather and climate comes when scientists are questioned how they can foresee climate 50 years from now when they cannot calculate the weather a few weeks from now. The chaotic nature of weather makes it unpredictable beyond a few days. Projecting changes in climate (i.e., long-term average weather) due to changes in atmospheric composition or other factors is a very different and much more manageable issue. As an analogy, while it is impossible to predict the age at which any particular man will die, we can say with high confidence that the average age of death for men in industrialised countries is about 75!

Climate Change, Causes & Impact

A part of the radiation from the sun that falls on the earth is absorbed by the earth and some of it is reflected back into the atmosphere. This enables people, animals, and plants to live safely. Carbon dioxide is one of the gases responsible for this effect. Naturally occurring gases known as greenhouse gases help capture the sun's energy, keeping the earth warm enough to sustain life. Deforestation, burning of fossil, emissions, and the like result in an increase in the average temperature gradually increases over time, it causes climatic changes. This phenomenon is referred to as climate change (P.B. Sahasranaman, 2009). The IPCC defines climate as follows; "Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system" (IPCC, 2013).

Since the beginning of the 20th century, scientists have been observing a change in the climate that cannot be attributed to any of the "natural" influences of the past only. This change in the climate, also known as global warming, has occurred faster than any other climate change recorded by humans. The main cause of global warming is the increased concentration of greenhouse gases in the atmosphere from the time when the industrial revolution in the late 18th century. The increased amount of a gas which absorb and re-emit thermal radiation, has directly led to more heat being retained in the atmosphere and thus an increase in global average surface temperatures. The increase in temperature is also leading to other effects on the climate system. Together these affects are known as anthropogenic (human caused) climate change.

Adding more of a greenhouse gas, such as CO₂, to the atmosphere intensifies the greenhouse effect, and it warms the Earth's climate. The amount of warming rests on several feedback instruments. Such as, the atmosphere warms due to rising levels of greenhouse gases, its concentration of water vapour increases, further intensifying the greenhouse effect. This in turn causes more warming, which causes an additional increase in water vapour, in a self-reinforcing cycle. This water vapour feedback may be strong enough to roughly double the increase in the greenhouse effect due to the added CO₂ alone.

Scientists have not only observed past changes in the climate but also try to analyse possible future changes. For this purpose they have developed a number of tools. Just as an architect might build a scale model of a building to understand and predict its behaviour. So too climate scientists can build a computer-based model of the climate system to understand and predict its behaviour. One of the inputs to a climate model are emission scenarios, which estimate future releases of greenhouse gases and aerosols to the atmosphere based on assumptions concerning, for example, future socioeconomic and technological developments. The outputs of a climate model feed into a climate projection, i.e. a simulated response of the climate system to a certain emission scenario. This dependence on emission scenarios differentiates climate projections from climate predictions which are based on circumstances that are known currently and expectations about the physical procedures that will define future changes.

Climate change has an impact on almost every aspect of our lives. Our ecosystems suffer biodiversity and habitat loss and human systems like health will be negatively impacted, for example by the spread of disease vectors like mosquitos. Climate change also challenges us to rethink our urban systems (including transport and buildings) and the way we do business (including green business opportunities). The impacts of climate change might also result in conflict or force people to migrate (for example from low-lying coastal areas).

Right to Food

Everyone has the right to life, liberty, and security of person (UDHR, 1948). By the term 'life' as here used something more is meant than mere animal existence. The inhibition against its deprivation ranges to all those branches and abilities by which life is relished. The idea of protecting life within

the context of human rights law is perhaps fundamental since, as the Higher Courts as well as various legal instruments has explained on numerous occasions, protecting right to life is nothing but protecting various aspects of right to life. According to Bhagwati J., we think that the right to life includes the right to live with human dignity and all that drives with it, namely, the basic necessities of life such as satisfactory nutrition, clothing and shelter. The concept of a 'dignified life' guaranteed by Art.21 seems to be inexhaustible in range and scope. As per interpretation of Article 21 of Constitution of India, Supreme Court held various aspects like right to livelihood, medical care, shelter, health, etc are nothing but the components of right to life. And Right to Food is one of them. The right to life is the first and foremost of all human rights. It affects all other issues and without it, a person never gets the opportunity to exercise any other right. Thus, without Life, all other rights and issues are worthless. There is no doubt that without food no life is possible and therefore right to food is an aspect of right to life. It is necessary to find out its legal status or what kind statutory recognition is there.

Secretary-General Ban Ki-moon said, Food and nutritional security are the fundamentals of a dignified life. The International Covenant on Economic, Social and Cultural Rights under Article 11 says: "The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous-improvement of living conditions. The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent. The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, which are needed: (a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources; (b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need" (ICESCR, 1976).

'Freedom from hunger' could be quantified by the numeral people suffering from malnutrition and at the extreme, dying of starvation. The 'right to adequate food' is a much higher standard, including not only nutrition, but to the complete range of potentials associated with food, including safety, diversity and dignity, in short all those elements needed to enable an vigorous and healthy life.

Inspired by the above definition, the Special Rapporteur on the Right to Food in 2002 defined it as follows: The right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensure a physical and mental, individual and collective, fulfilling and dignified life free of fear. (UNO, 2008).

This definition requires all normative elements clarified in detail in the General Comment 12 of the ICESCR, which states: "...the right to adequate food is realized when every man, woman and child, alone or in community with others, have the physical and economic access at all times to adequate food or means for its procurement" (UNO, 1999).

According to the Food and Agriculture Organization of the United Nations, the right to food does not infer that governments have a compulsion to hand out free food to everyone who wants it. This is a public delusion.

The right to food is not a right to a least portion of calories, proteins and other precise nutrients, or a right to be fed. It is about being guaranteed the right to feed oneself, which requires not only that food is available – that the ratio of production to the population is sufficient – but also that it is accessible – i.e., that each household either has the means to produce or buy its own food. However, if individuals are disadvantaged of access to food for reasons beyond their control, for instance because of an armed conflict, natural disaster or because they are in detention, recognition of the right to life obliges States to provide them with sufficient food for their survival.

The Indian National Food Security Act, 2013 (also Right to Food Act) is enacted by the Parliament. This law desires to provide sponsored food grains to people. India has become one of the nations in the world to make access to food as a legal right. When India became independent, the Constitution declared it to be a socialist, secular, democratic Republic. This has been interpreted by the highest court as every person has a right to a life in dignity, good health and free speech in a fraternity of communal harmony and national integrity. These rights are possible only if you are not starving, in the first place. The Act provides legislative credentials to right to food and its implementation will provide, protect and secure the right to food of every individual.

Right is a moral or legal entitlement to have or do something. So it has four aspects and these are morality, legality, entitlement, to have or do something. Here, First three aspects are or can be determined. The question is with the fourth, which gives rise to interpret the word 'something'. 'Something' must have or able to get other three aspects in respect to sanctity. We can trace this concept of right into various theories propounded by jurists, philosophers and also the interpretation of it from the precedents. Will and choice theory, interest and benefit theory, etc are the theories where we can find the answer to our question.

Right to Food is an integral part of this right and it is derived from right to life. Right to life is a natural right and it is legally guaranteed. India Constitution which is the law of the land also sanctions right to life under article 21. The interpretation of this article by various authorities gave a broader perspective to this right and thus includes right to livelihood, health, medical, shelter, food, etc. Henceforth right to food is a fundamental right. If right to food is not protected, man cannot claim any other right. Therefore this is a vital right and which plays an important role in this era where need to protect right to food is arisen due to various factors.

To know the evolution and historical background, we have to trace it from the period of Dharma, Shrutis-Smritis, Chandragupta Dynasty, etc where the tracings can be found regarding right and safety of food. Magna-Carta firstly provided right to food and got legal sanction into it. In the British India i.e. pre-independence period and post-independence period, there was recognition of this right which further gets modified time to time. The Food Security Act, 2013 (i.e. Right to food Act) is the greatest achievement in protecting and providing right to food to every individual.

There is need to protect right to food because of various reasons. This right does not only create right to get or provide food but also the right in context with availability, accessibility, dietary, economic, etc. The impulse of justice and human rights in connection to the right to food has its foundations deeply rooted in the jurisprudence.

Rousseau's' General will theory and John Finnis' Seven goods- three requirements theory has its implications on right to food. Roscoe Pound's Social Engineering theory talks about three interests and on analysis we can find the right to food has its traces in public, private as well as social interest and also attached to the role and duty of the state to protect this right. Rawls' theory of justice is also having the nexus with the right to food.

Martha Nussbaum, an American philosopher. She mainly deals with Greek and roman philosophies with the political and ethical factors attached to it. She is a modern philosopher thus connects the various philosophies to the present situation. Her work on cultivating humanity and social justice is important from right to food point of view as well.

As we are dealing with right to food, the situation today is the warning alarm to act in furtherance. International regime is acting thusly to provide, protect and secure the right to food by various means and instruments.

United Nations Organisation as well as the Food and Agricultural Organisation are conducting various programmes all over the world to overcome the problem of hunger. The framework and conventions are putting obligation on the states in providing and protecting right to food of every individual. World Bank as a financier also plays an important role in eradication of hunger. As right to food include dietary, safety, etc rights, the World Health Organisation has its role to play. The implementation mechanism in the countries like Brazil, China, etc is the efficient one because of the positive results.

After discussing, origin, foundations and international perspective, we should analyse this right through national statutes. In India, the Constitution provides and protects the right to food under right to life and liberty. It provides right to food as a fundamental right and imposes duty on state to provide and protect this right. The PUCL petition on right to food gave orders directing the government in protecting and securing the right to food. It provides legal foundation to the right to food. Then after PUCL, various orders are given by the Supreme Court of India. Government is also making the plans and schemes to protect right to food. The Food Security Act, 2013, the recent Act which legally sanctions the right to food with the creation of various rights and duties in context with the right to food. Though it has been criticised, the need of the day is the efficient implementation mechanism of the Act.

The comparative analysis of India with various other Countries in implementing right to food and providing, protecting and securing the right to food is also an important factor. It will give us the way to adopt the policies and implementation mechanism to achieve great success in eradication of the hunger. The positive results which are the outcome of various programmes from countries like Brazil, Switzerland, South Africa, Bangladesh, Mozambique and Nicaragua can be adopted in India to overcome the problem of hunger and to achieve the food security. The Indian laws and systems are also having the positive attitude towards achieving one of the millennium goals, i.e. free from Hunger.

And lastly it will conclude with the suggestions and ideas that will help to strengthen the implementation mechanism aiming towards providing, protecting and securing right to food of EVERY individual.

Interrelationship

Global climate change such as the shift in pattern and intensity of rainfall and variations in temperature can reduce agricultural yield and damage infrastructure leading to slower economic growth and increasing poverty threatening food security. Predicted flood and drought could cause many people to lose their livelihood, by migrating or displacing, while increasing temperature could increase the incidence of vector borne diseases and lead to heat related insufficiency of death and water. However a large section of the society suffers from food and nutrition insecurity in India, the worst affected groups are landless people with little or no land to depend upon, petty self-employed workers and destitute including beggars traditional artisans, and providers of traditional services.

Food security is the outcome of food system processes all along the food chain. Climate change will disturb food security through its impacts on all mechanisms of universal, national and local food systems. Climate change is real, and its first impacts are already being felt. It will first affect the people and food systems that are already vulnerable, but over time the geographic distribution of risk and vulnerability is likely to shift. Certain livelihood groups need immediate support, but everybody is at risk.

Climate Change on Food Access

While there has been considerable progress in understanding the sensitivities of crop production to yield, there are relatively few models which assess the impact of climate change on access to food. According to the Fourth Assessment Report of the IPCC, depending on the climate change scenario, 200 to 600 million more people globally could suffer from hunger by 2080. Climate change amplifies the economic drivers of food insecurity. Variation in the length of the crop growing season and higher frequency of extreme events due to climate change and the consequent growth of output adversely affect the farmer's net income. India is particularly vulnerable because its rural areas are home to small and marginal farmers who rely on rain-fed mono-cropping, which provides barely a few months of food security in a normal year.

Food is distributed through the market and non-market distribution mechanisms. Causes that determine whether people will have access to food through markets are considered in the affordability aspects. These factors include income-generating facility, the amount of compensation received for products and goods sold or labour and services rendered and the proportion of the price of a minimum daily food basket to the average daily income. A family might decrease the daily quantity of food consumed evenly among all household members, or distribute food preferably to certain members often the able-bodied male adults who are assumed to need it the most to stay fit and healthy or continue working to maintain the family. Non-farming may lower the income of rural and urban households whose incomes go down below the poverty line because of climate change impacts will face similar choices. Allocation issues resulting from climate change are therefore likely to become more significant in urban areas over time. Urban agriculture has an inadequate ability to contribute to the benefit of poor people in India because the bulk of their constant food requirements still need to be transported from rural areas. Changing climatic conditions may affect both the physical and the economic availability of certain chosen food items, which might make it impossible to meet some preferences. Change in availability and relative prices for major food items may result in people either changing their food basket or spending a bigger percentage of their income on food when prices of preferred food items increase.

Climate Change on Food Utilization / Food Absorption

Food insecurity is linked with malnutrition. The people who are unable to consume nutritious and ample food do not satisfy all their nutritional requirements. Nutritional status is also adversely affected due to low small scale horticulture production resulting from scarcity of water or labour and decline in the availability of mild foods. In general, however, the main impact of climate change on nutrition is possible to be felt indirectly, through its effects on income and ability to purchase in order to spread their food basket. In India, climate change will cause new patterns of pests and diseases to appear, affecting plants, animals, and humans, and posing a new threat to food security, food safety, and human health.

There are many potential impacts of climate change on food absorption but there is a dearth of quantitative studies on the subject which focus on India. Overall, the global threat is that climate change could lead to a reduction of production and consumption of certain foods that play a critical role in the diets of poor rural and indigenous populations such as fish, fruits and vegetables, and wild foods. The urban poor living in informal settlements are particularly vulnerable, absent the basic facilities such as piped water, sanitation, clean drinking water, drainage systems, and health facilities. High incidence of under-nutrition due to poverty exposes the urban poor to diseases linked to climate impacts, which in turn aggravates under-nutrition and ill-health and reduces the ability to adapt and build resilience to climate change. Children have been found to be at greater risk when food supplies are restricted.

Climate Change on Food Sustainability

Many crops have annual cycles and yields which fluctuate with climate variability, particularly rainfall and temperature. Maintaining the continuity of food supply when the production process is seasonal in nature is a therefore challenging task. Droughts and floods are a particular threat to food stability and could bring about both chronic and transitory food insecurity. As we know India is a

country which is more prone to drought and floods. Both are expected to become more frequent, more intense in India and less predictable as a consequence of climate change.

Adaptation to Climate Change & Right to Food

Adoption of Sustainable Agricultural Practices

A four-pronged strategy is recommended for the water sector: Increase irrigation efficiency; Promote micro irrigation in water-deficient areas; better water resource infrastructure planning; Restoration of water bodies in rural areas.

Long-Term Relief Measures In The Event Of Natural Disasters

India's disaster-management strategies are mostly inadequate, short-lived and poorly conceived. Also, much of the emphasis is laid on providing quick relief to the affected households as opposed to developing long-term adaptation strategies. Little effort is made towards addressing the long-term impacts of natural disasters on agricultural productivity and under-nutrition.

Enhance Livelihood Security

Achieving food security in the context of climate change calls for an improvement in the livelihoods of the poor and food-insecure to not only help them escape poverty and hunger but also withstand, recover from, and adapt to the climate risks they are exposed to. India's National Rural Employment Guarantee Act (NREGA) of 2005 marked a global milestone in the history of poverty alleviation. Given the level of urban poverty, under-nutrition, and lack of remunerative employment, there is a strong case for providing guaranteed employment on the lines of NREGA in urban areas as well. Such a scheme should be tailored to not only provide livelihood security to the urban poor but also create climate resilient urban infrastructure in Indian cities. Additional efforts are required for the vulnerable populations residing in the ecologically fragile coastal and forest regions.

Mitigation of Climate Change & Right to Food

Stronger Emphasis on Public Health

India has historically had a poor record in public health. With the worsening challenges of climate change, the country's policymakers have also paid little attention to its impacts on health. Despite the fact that the disease burden from vector-borne and diarrhoeal diseases is very high in urban slums and tribal areas of India, this area was overlooked when the original National Action Plan for Climate Change (NAPCC) was formulated (ORF, 2020).

Greater Emphasis on Urban Food Insecurity

Urban India is not only an important contributor to global greenhouse gas emissions but also a victim of climate change as poor people account for the bulk of its population. As observed earlier, climate change will have an enormous impact on urban food insecurity. Therefore, urban food insecurity deserves serious attention. The approach towards tackling urban food insecurity must take into account both the access and absorption dimensions of food insecurity. To improve access to healthy food, effective public distribution systems need to be put in place.

Conclusion

In the food and agriculture sector, adaptation and mitigation often go hand in hand, so adopting an integrated strategic approach represents the best way forward (FAO, 2020). Several funds within the United Nations system finance specific activities aimed at reducing greenhouse gas emissions and increasing resilience to the negative impacts of climate change. Because many mitigation actions that would have high payoffs also represent good options for adaptation within the food and agriculture sectors of low-income developing countries, it may be possible to obtain additional resources from bilateral and multilateral aid agencies, which are becoming increasingly interested in investing development resources in adaptive responses to climate change.

The ultimate goal of FAO's climate change work is to inform and promote local dialogue about what the impacts of climate change are likely to be and what options exist for reducing vulnerability, and to provide local communities with site-specific solutions.

The significance of its dimensions and the overall impact of climate change on it will differ across regions and over time. Unbalanced use of nutrients, low water use efficiency, continued high demographic pressure, changes in pest/disease patterns, soil erosion, degradation and poor health, etc. would further worsen the situation. In the likely event of enhanced adverse impacts of climate change on agriculture in developing countries like India, where poverty is also concentrated, mitigation and adaptation strategies would demand far greater research and development effort, and financial, institutional and policy support.

Climate change has an effect on every aspect of our lives. Our ecosystems suffer biodiversity and habitat loss and various human systems like health, fresh water, agriculture, etc. is getting negatively impacted. Climate change also challenges us to rethink our urban systems and the way we do business. Global warming refers to the overall warming of entire surface of the earth and climate change refers to changes in climate characteristics, including temperature, humidity, rainfall, wind and severe weather events over long term of periods. To overcome the problem, we have number of Laws International and National but still the laws are becoming less effective or are not sufficient to meet the high alert of the climate change.

Let us not, however, flatter ourselves over much on account of our human victories over nature. For each such victory nature takes its revenge on us.

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