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Livelihood Challenges of Farmers in South Asian Countries: Bridging the Gap between International and National Legal Instruments and Policies for Climate Change and Sustainable Development

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Abstract

In this paper, author has attempted to examine national and international legal instruments and policies relating to climate change and sustainable development through the lens of livelihood challenges for farmers. Researcher has also attempted to explore the farmers' concern in different national and international legal instruments, declarations and policies. This paper also finds out an impact of climate change on farmers and agricultural sector, which is the backbone of economy for many South Asian countries. Despite of the efforts of different international organizations, still problems like climate change induced livelihood challenges for farmers, food security problems etc. in South Asian countries including Bangladesh, China and India, are persisting. Besides, in this paper, researcher has vigorously argued that concern of farmers is only the missing link between climate change induced problems and sustainable development. Sustainable development will be a reality when livelihood challenges of farmers and especially agricultural sector will be addressed in the climate change related legal and policy documents. This paper takes a broader view and explores the multiple effects that climate change can have on farmers, food production and food security. It also tries to explore an adaptation and mitigation measures, especially in the agricultural sector with reference to farmers of South Asian countries.

Keywords: *Farmer, Policy, International Legal Instrument, Sustainable Development, Climate Change, Livelihood, South Asian Countries etc.*

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INTRODUCTION

We are talking too much about climate change at global arena through International Conferences, Negotiations, Declarations, Policies and Plans, but are not able to pin point, who are ultimately getting affected due to menacing problem of climate change? Whose interest ultimately is at stake and threat, due to historical fact of more emissions caused by developed countries including United States of America (U.S.A.)? Whether International Legal Instruments and Policies are capable enough to sustain interests and human rights of poor people, who are dependent on agriculture for their livelihood? These are some major questions which should be addressed properly for getting a suitable model for bridging the gap between climate change related international legal instruments and sustainable development.

It is significant to note that situation of agriculture and crop productivity of developing countries, especially South Asian countries, including Bangladesh, China and India have been continuously getting affected due to climate change-induced floods, drought and unseasoned monsoon, consequently, it has direct impact on the livelihood of farmers and agriculture sector.

Moreover, it is significant to take into consideration the basic idea of 'sustainable development' which was reflected through different international conferences and declarations. Brundtland Commission Report of 1987 has clearly stated about the sustainable development as the development which meets the needs of present generation without compromising the needs and aspirations of

future generations. The principle related to sustainable development which was reflected through United Nations Conference on Environment and Development, 1992 in Rio-de-Janeiro, had mainly emphasized on the inclusive development, taking into consideration society, economy and environment, based on the Brundtland Commission Report. Despite the efforts of United Nations Organization, especially to prevent the menace of climate change in 1992, through framing the United Nations Framework Convention on Climate Change (UNFCCC), problem still persists. Conversely, different issues are cropped up due to rising global warming such as climate change-induced livelihood challenges for farmers and threatened crop productivity in South Asian countries. International legal instruments such as UNFCCC, 1992 does not address the issue of climate change induced livelihood challenges for farmers. The most severe impact of climate change is being felt by vulnerable populations of South Asian countries who have contributed least to the problem as compared to developed countries such as the U.S.A. and European countries. Climate change is an inevitable and urgent global challenge with long-term implications for the sustainable development of all countries including South Asian countries. Climate change is expected to impact nearly every aspect of life; natural disasters are becoming more frequent and intense, agricultural conditions are changing, and diseases are becoming more prevalent.

A key challenge in responding to climate change is the increasing number of events of floods. From 1999 to 2008, floods affected almost 1 billion people in Asia [1]. The corresponding figures were about 4 million in Europe, 28 million in the America and 22 million in Africa. For instance, the 2010 flood in Pakistan affected more individuals than the combined impacts of the Indian Ocean tsunami (2004), the Kashmir earthquake (2005) and the Haiti earthquake (2010). Flash floods in the Himalayas are estimated to cause the loss of at least 5,000 lives every year [2]. Climate change creates immediate and direct impacts on the agriculture. Rising sea levels are displacing coastal farming communities, shifting weather patterns and declining water supplies, raising the spread of drought and crop failures are just some of the effects already being experienced across the globe.

Consequently, agricultural systems, people, and institutions would come under increasing stress and pressure. Law and legal systems are significant social institutions playing critical roles in shaping a more sustainable future for individual farmers as well as nations. Climate change presents new challenges to the ideals of sustainable agriculture and sustainable development and ultimately those, whose livelihood is depended on agriculture [3].

Climate change has emerged as one of the most important environmental issues ever to confront humanity. It is seriously affecting the ecosystem worldwide. The effect of climate change and global warming is also being felt in South Asian countries including India. It is taking place due to the increasing concentration of carbon dioxide in the atmosphere. Global warming is the rising in temperature of the earth leading to climatic changes, which are taking place due to the emission of carbon dioxide, greenhouse gases [4] and fume discharges from the Chemical Industries. It is fact that our everyday activities may be leading to changes in the earth's atmosphere that have the potential to alter the planet's heat and radiation balance. The last decade of the 20th Century has been reported to be the warmest decade [5].

Climate change affects mostly rural people and those who are dependent on agriculture. It hurts poor countries and poor communities most. It is significant to note that the effect of climate change is mainly felt by developing countries including South Asian countries. Climate change is already exacerbating chronic environmental threats, and ecosystem losses are restraining livelihood opportunities, especially for farmers who are dependent on agriculture. Farmers and agricultural sector have become more vulnerable to the effect of climate change. This is apparent fact in the developing countries, especially in South Asian countries including India, that climate change and global warming has direct impact on agriculture, consequently upon the

livelihood of farmers. Global warming has direct effect in the form of floods, droughts, loss of crops, less agriculture productivity, farmers' suicides due to failure of crops etc. It is affecting more to the people of rural area whose livelihood is dependent on the farming and agriculture.

Sustainable Development Goals (SDGs)

With the success of the Millennium Development Goals (MDGs) the members of the UN met together to formulate the SDGs to carry the achievements of the MDGs for next 15 years i.e., from 2016–2030 with the seventeen goals to completely achieve that what was stared in 2000 with the introduction of the eight MDGs.

The second of the seventeen proposed SDGs is "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture". It aims that by 2030, the world should achieve double of the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and nonfarm employment [6]. It also aims to increase investment through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, specifically in least developed countries [7].

Recent Warsaw Outcome through the Lens of Farmers' Concern

The 19th Session of the Conference of Parties (COP 19) held at Warsaw, Poland laid the foundation for 2015 Climate Agreement by keeping governments on track. Warsaw has set a pathway for governments to work on a draft text of a new Global Climate Agreement which may be placed on table in December of this year in Climate Change Conference (COP 20) at Lima, Peru. The death and destruction brought by the Philippines Storm helped to highlight the question of climate justice [8]. The "loss and damage mechanism" under the treaty witnessed difference of opinion between developing countries and developed countries. The United States and European Union opposed the mechanism proposed by developing countries, fearing new financial claims. The mechanism relating to "loss and damage" which was suggested by developing countries especially South Asian countries to tackle climate change induced problems like decreased agriculture crops and livelihood challenges for farmers could not become reality because of indifferent attitude of developed countries to accept obligation for loss and damage by climate change.

Bangladesh and Climate Change Impact on Agriculture and Farmers

It is predicted that climate change could have devastating impact on agriculture. Agriculture is a key economic driver in Bangladesh, accounting for nearly 20 percent of the GDP and 65 percent of the labour force. The performance of this sector has considerable influence on overall growth, the trade balance, and the level and structure of poverty and malnutrition. The United Nations Environment Program estimates a one-meter rise in sea level would inundate 17,000 square kilometers of Bangladesh's land, over ten percent of its total land mass. This is a serious threat to a country like Bangladesh.

Moreover, much of the rural population, especially the poor, is reliant on the agriculture as a critical source of livelihoods and employment. The impacts of climate change could affect agriculture in Bangladesh in many ways:

1. The predicted sea-level rise will threaten valuable coastal agricultural land, particularly in low-lying areas.
2. Biodiversity would be reduced in some of the most fragile environments, such as Sunder bans and tropical forests.
3. Climate unpredictability will make planning of farm operations more difficult.

The consequences of these impacts will threaten food security for the most vulnerable people of Bangladesh. The country's agriculture sector is already under stress from lack of productivity and population growth.

Any further attempt to increase productivity will likely to add pressure to available land and water resources. In Bangladesh, a rise in sea level of 1 meter would lead to the inundation of 15% to 18% of the country's land mass, and by the year 2050, a total of 30 million people [9].

Bangladesh has already achieved one of the key Millennium Development Goals (MDG) - gender parity in primary and secondary schooling. The country is on track to achieve most of the MDG goals, even the difficult ones like infant and maternal mortality by 2015.

Agriculture is the largest employment sector in Bangladesh. As of 2016, it employs 47% of the total labour force and comprises 16% of the country's GDP. The Government of Bangladesh signed a US$10 million grant agreement on 30 September 2013 with the World Bank to introduce solar irrigation pumps for farmers [10].

The Solar Irrigation Project will enable installation of more than 1,500 solar powered irrigation pumps covering more than 65,000 bighas of land for rice cultivation. The project will be financed by the Bangladesh Climate Change Resilience Fund (BCCRF) [11].

However, the negative impacts which are predicted due to global warming could reverse the recent social and economic benefits. The progress towards achieving the MDGs, such as combating communicable diseases, eradicating poverty, and ensuring environmental sustainability could be uncertain to attain.

Climate Change Strategy and Action Plan (2009) of the Government of Bangladesh

The Government of Bangladesh (GOB) took the initiative to prepare the Climate Change Strategy and Action Plan 2009 ("the BCCSAP 2009") to carry forward and coordinate climate change activities in the country. BCCSAP 2009 has identified six broad areas of actions (i) food security, social protection and health; (ii) comprehensive disaster management; (iii) infrastructure; (iv) research and knowledge management; (v) mitigation and low carbon development; and (vi) capacity building and institutional strengthening [12]. In BCCSAP 2009 one missing link is that of farmers' livelihood which is dependent on agriculture. A Climate Change Unit has been established at the Department of Environment and Forests to coordinate the overall activities on climate change in the country. The implementation of the BCCSAP 2009 will be financed through GOB's own resources, including Climate Change Trust Funds and bilateral and multilateral support. US$ 10 billion will be required to implement BCCSAP 2009 in five years. Even though strong action plan was devised by the Government of Bangladesh for combating climate change, still there is gap between climate change adaptation resilience and sustainable development, including the social progress, avoiding livelihood challenges of farmers.

Bangladesh Climate Change Resilience Fund (BCCRF) Vision Statement [13]

The Government and development partners in Bangladesh agreed on a fourfold vision statement for BCCRF:

By 2020 the BCCRF will be completely a government led, owned and managed and would work as a sustainable climate change financing mechanism, aimed at developing capacity and resilience of the country to meet the challenges of climate change. BCCRF will support the implementation of the BCCSAP through an institutional framework by:

1) Serving as a financing mechanism to bring global climate change funding to Bangladesh.
2) Serving as a climate fund, which also brings innovation, harmonization and added value to the GoB's climate change initiatives.
3) Supporting implementation of prioritized, results-oriented climate change interventions that deliver sustainable outcomes particularly targeting the least resilient.
4) Providing a platform for coordination of BCCRF stakeholders and acting as a catalytic agent for wider coordination.

China and Climate Change Impact on Agriculture and Farmers

China's agricultural GDP has grown at an average of 5 percent annually over the last three decades, and while this figure is less than the 10 percent annual growth in total GDP, it

is nonetheless respectable. Within the agricultural sector, significant structural changes have taken place. Commodities' share of the total value of agricultural output fell from 82 percent in 1970 to less than 50 percent after 2006 [14].

Researchers have long pointed out that rural people are particularly vulnerable to climate change, especially in the case of extreme weather events such as droughts and hailstorms [15]. In the dry regions of western China such as Ningxia Province, a reduction in rainfall and an increase in the incidence of drought in recent years have been shown to affect local farming activities and livelihood 16].

China's Policies and Actions for Addressing Climate Change, 2013

The National Development and Reform Commission has organized China's Policies and Actions for Addressing Climate Change the compilation of the National Plan for Addressing Climate Change (2013–2020) [17]. After an overall analysis of the trends and impacts of climate change in China, as well as the current situations and challenges in addressing climate change, the National Development and Reform Commission proposed the main target, major tasks and safeguarding measures for addressing climate change by 2020 [18]. Additionally, it has outlined the general framework for addressing climate change in China. All provinces (including the autonomous regions and municipalities directly under the central government) have taken active steps in carrying out the formulation of mid and long-term plans for addressing climate change at the provincial level [19]. Significantly, National Plan for Addressing Climate Change (2013–2020) does not consider specifically the livelihood challenges for farmers. It also does not state how to cope up with the loss of agricultural crops due to change in climate, which is major problem in developing countries including, China.

Five-year Climate Smart Agriculture Project

In 2014, the National Development and Reform Commission has invested over 20 billion Yuan within the central government's budget to support the construction of production bases for agricultural products such as grain and cotton, and to strengthen field projects based on small-sized farmland hydrological projects to improve disaster prevention and mitigation capabilities [20,21]. The China government seeing the then present scenario aimed at working on to promote and expand the Dryland Agriculture Technology and develop new methods and techniques to support dry land water-saving agriculture in north, northeast and northwest China [22].

The Ministry of Agriculture and Global Environment Facility (GEF) has jointly invested in a *Five-year Climate Smart Agriculture Project* in major grain production bases. The project aims at increasing the adaptation of farming to climate change and promoting energy saving and emissions reduction in agriculture [23].

In 2015, The Ministry of Agriculture (MOA) has worked in conjunction with China Meteorological Administration to organize work such as [24]-

1) Strengthening Guidance and Services to Win Summer Grain Harvest,
2) Fighting Spring Drought and Flood to Ensure Spring Seeding in Northeast, and
3) Enhancing Services and Fighting Disasters to Win Autumn Grain Harvest.

The main aim of the National Plan for Addressing Climate Change (2014–2020), is to achieve low-carbon development in saving energy, streamlining energy structure, adjusting industrial structure, ecological construction and environmental protection, engage in international negotiations on climate change in an active and constructive way, continue to promote bilateral and multilateral dialogues, communication and pragmatic cooperation on climate change, and make greater contribution to the protection of global climate environment. Even these goals are aimed at, but, at the same time the agricultural sector gets no attention and it keeps on fighting against the climate changes.

India and Impact of Climate Change on Agriculture and Farmers

Agriculture in India is entirely dependent on monsoons since ancient times. Even a small change in monsoon trend affects agriculture drastically. The increasing temperature is also

affecting the Indian agriculture. In the states of Chhattisgarh, Odisha and Jharkhand alone, rice production losses during severe droughts average about 40% of total production, with an estimated value of $800 million. In the Indo-Gangetic Plain, these pre-monsoon changes will primarily affect the wheat crop. It has direct impact on the farmers especially those who have small and fragmented pieces of lands.

Recent studies done at the Indian Agricultural Research Institute indicate the possibility of loss of 4-5 million tons in wheat production in future with every rise of 1-degree Celsius temperature throughout the growing period. Rice production is slated to decrease by almost a tonne/hectare if the temperature goes up by 2- degree Celsius [25]. In Rajasthan, a 2-degree Celsius rise in temperature was estimated to reduce production of Pearl Millet by 10–15%. If maximum and minimum temperature rises by 3 degrees Celsius and 3.5 degree Celsius respectively, then Soybean yields in Madhya Pradesh will decline by 5% compared to 1998. Agriculture will be worst affected in the coastal regions of Gujarat and Maharashtra, as fertile areas are vulnerable to inundation and Salinization [26].

A Scanning of Farmers' Concern in Twelfth Five Year Plan (2012–2017) of Indian Government

It is significant to note that the Twelfth Five Year Plan (2012–2017) of Government of India recognizes the inclusive development. The key strategies in the Twelfth Plan have been identified as:

1. Social and Physical Infrastructure;
2. Inclusiveness of all categories of vulnerable groups;
3. Women's Participation in Governance; and
4. Economic Empowerment;
5. Enabling Legislations.

Twelfth Five Year plan states that there are inclusive growth concerns in all aspects. It also suggests climate change adaptation strategies will be made a part of all ongoing poverty reduction and development policies, including Disaster Risk Reduction (DRR) planning and implementation at local, national and regional level, country's Nation Adaptation Programmes of Actions (NAPAs); and in numerous climate change related funds that are in the process of being established. This Five-Year Plan also identified the climate change induced problem such as low agriculture productivity. But the main concerns of farmers and their livelihood challenges and mainly farmers' suicides due to due loans and crop failures have not been adequately addressed by Twelfth Five Year Plan.

The major impacts of climate change will be on rain fed or un-irrigated crops, which are cultivated on nearly 60 percent of cropland. A temperature increase by 0.5C in winter temperature is projected to reduce rain fed wheat yield by 0.45 tonnes per hectare. Possibly there might be some improvement in the yields of chickpeas, maize, sorghum and millets and coconut on the west coast and less loss in potatoes, mustard and vegetables in north-western India due to reduced frost damage. Increased droughts and floods are likely to increase production variability [27].

Vulnerability to climate change is closely related to poverty, as the poor have fewer financial and technical resources. They are heavily dependent on climate-sensitive sectors such as agriculture and forestry; they often live on marginal land and their economic structures are fragile [28].

Impact and vulnerability of Indian Agriculture to Climate Change

Agriculture in India today is facing the challenges of adapting to the projected variations of change in climate. It is essential for the agriculture to develop processes to reduce its vulnerability. The Indian Council of Agricultural Research (ICAR) has already begun the research to evaluate the effects of climate change on various crops.

Cereal Crops: The Asia-Pacific region is likely to face the worst impacts on cereal crop yields. Loss in yields of wheat, rice and maize are estimated about 50%, 17%, and 6%, respectively by 2050 [29]. This loss of yield will affect the food security of approx. 1.6 billion people in South Asia. The projected rise in temperature of 0.5°C to 1.2°C will be

the major cause of reduction of food production in major areas of South Asia.

Wheat: India is the second largest producer of wheat and the national productivity of wheat is about 2708 kg/ha. The North Indian states such as Uttar Pradesh, Punjab, Haryana, Uttaranchal and Himachal Pradesh are some of the major wheat producing states. Here the impact of climate change would be profound, and only a 1°C rise in temperature could reduce wheat yield in Uttar Pradesh, Punjab and Haryana. In Haryana, night temperatures during February and March in 2003–04 were recorded 3°C above normal, and subsequently wheat production declined from 4106 kg/ha to 3937 kg/ha in this period [30].

Climate Change Justice: The Dilemma Regarding Consensus

At this juncture it is important to note here that climate change is not the concern of only one country, but it is the concern of whole world. It is reality that the developed countries like U.S.A. are not ready to reduce their industrial emission and the developing countries are also not prepared to reduce their emission up to the standard level. Even after recent Warsaw Conference on Climate Change, CoP 19 the stand of USA is still not favorable towards acceptance of binding emission cut agreement unless China and India accept the binding emission cut agreement. At the same time developed and developing countries are defending their activities within their territories on the basis of right to development. The developed countries have already polluted the environment and now they are asking the developing countries including India to reduce their industrial emission and greenhouse gases. This conflict between developed and developing countries is the main obstacle in solving the problem of global warming.

Internationally, efforts are made to address this problem for the last two decades, with the Earth Summit at Rio in 1992 as an important starting point. Rapidly developing countries such as China and Brazil are expected to adopt a more pro-active role, although India as a developing country does not have any commitment or responsibility at present for reducing the emissions of greenhouse gases such as CO_2 that lead to global warming, pressure is increasing on India and other large.

Simultaneously, the developed countries of the North are trying to reduce the extent of their commitments for emission degradation. In such a situation, the public, the government and policy makers need to be aware of the implications of the problems of global warming.

Moreover, it is significant to take into consideration the principle 21 of the Stockholm Declaration which is the major outcome of the United Nation Conference on Human Environment held at Stockholm in 1972 and the principle 2 of Earth Summit or United Nations Conference on Environment and Development held at Rio-de-Janeiro, which provide that states have sovereign right to exploit their own resources pursuant to their own environment policies and the responsibility not to damage the environment of states beyond the limits of national jurisdiction. But these principles are not binding on the nations. This is the major hurdle in the way of determining the liability and responsibility for the problem of climate change and global warming.

It is significant to note that the 1992 Rio Conference adopted the United Nations Framework Convention on Climate Change which aims to stabilize CO_2 emissions and other anthropogenic gases which accumulate in the atmosphere and trap the heat of the sun and enhance the greenhouse effect [31]. But the United Nations Framework Convention on Climate Change, 1992 deals with the relation between state and state. It does not deal with the issue of responsibility of state towards individual and specially that vulnerable group of poor people who are mostly dependent on the agriculture for their livelihood. In this background, there is legal gap in climate change regime to deal with the issue of climate change affected people especially farmers. Even recent Warsaw Climate Change Conference, 2013 held at Poland and different decisions which were taken including Decision

2/CP.19 related to 'Warsaw international mechanism for loss and damage' does not specifically talk about how to deal with loss and damage caused to the agricultural crop productivity and livelihood to the farmers of South Asian countries due to climate change.

The Climate Convention as an instrument to defend against the threat of global warming and as a means for sustainable progress faces some major problems. For example, it is compromise document and sets a voluntary goal of returning to 1990 levels by 2000 and the limit have been set by Kyoto Protocol from 2008–2012. IPCC Report states that the required outcome has not been achieved. This is the major reason which dilutes the effectiveness of the Convention. The financial mechanism provided in the Convention help the developing countries in terms of finance as well as new technologies [32]. But new sophisticated technologies require appropriate infra-structure, skills and institutional arrangements which are not available in the developing countries. India lacks such human and infrastructural capacity and because of that its efforts towards the problem of climate change are not meager. The technological lag is felt even in terms of productivity, where the outcome is leading to concentration of fertilizers found in the food available, at the same time, quantitative difference is also not sufficing for the rate at which subsequent population growth is taking place. Under the Convention, the developed countries are supporting the development and enhancement of indigenous capacities and technologies of developing countries. But, in reality, developed countries are not providing technology and finance in adequate manner. The competitive market is burdening the developing countries in a very sophisticated manner, where now since the developed countries want to keep their market large, the technological developments passed on are either flawed or aimed at profit of the developed nations. This can be seen in various strategies being employed. For example, the current spread of Ebola virus, can be seen from two perspectives. This is like an extension of the old policy used during the times when vaccination was not available to countries being exploited. Here as well, the spread of this virus is pertinent in a few areas only. So, a *factum* of dependence is developing on the developed nations.

In December 2015, the 21st Session of the Conference of the Parties (COP21/CMP1) convened in Paris, France, and adopted the Paris Agreement, a universal agreement whose aim is to keep a global temperature rise for this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels [33].

It is paramount to note that economies of developing countries are highly dependent upon fossil fuels and energy intensive products. Moreover, the developing countries are using obsolete and environmentally unfriendly technology supplied by the developed countries. In such circumstance it is difficult for the country like India to take adequate measure towards the menace of climate change. At the same time developing countries have no access to advanced and environment friendly technology which is protected by Intellectual Property Rights of developed nations. So, the challenge is how to ensure clean technologies for the developing world. The recent trend, however, is to a small extent contributing to technological advancement at a small pace though. For example, recently, as was promisingly seen in Ted Talks, Shubhendu Sharma, who was working with Toyota in India, devised a methodology to make a forest grow ten times faster than normal. Here, he used various mechanisms that speed the process of growth of plants, trying to replicate the technology used in car manufacturing, creating a system allowing a multilayer forest of 300 trees to grow on an area as small as the parking spaces of six cars, for less than the price of an i-phone. He now, is an eco-entrepreneur who is also working towards soil quality improvisation.

It seems that this is what the developing nations need today, better technologies which are compatible with the conditions of the nations. The developed nations do have enough insight to have extensive farming methodologies employed. However, nations like India, Pakistan, Bangladesh and other

developing South Asian nations have always had a high dependability on farmers, along with the fact that intensive farming having been the methodology employed all the time. So, keeping in mind the fact that climate changes are being rendered, the need of hour is to seek technological help in this sector and device the mechanisms which justify the existing conditions. Keeping too much in lines with the path taken up by developed nations is not the exact solution we seek.

Sustainable Development Goal 13 aims to "take urgent action to combat climate change and its impact", while acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change [34]. More specifically, the main targets of SDG 13 better focus on the integration of climate change measures into national policies; the improvement of education, creating awareness and institutional capacity on climate change mitigation, adaptation, impact reduction and early warnings [35].

Moreover, the Kyoto Protocol, 1997 on global warming enjoins on industrialized countries to reduce their greenhouse emissions by 8% of 1990 emission levels. It is important to note here that USA has refused to ratify the Kyoto Protocol. This move of the USA towards the Protocol and consequently towards the menacing problem of global warming is also influencing the efforts of other developed countries.

International concerns also arise due to the inability of ratifying nations to meet their commitments. The failure of signatories to meet their obligations, combined with the lack of repercussions signals to Annex I and developing nations that the Protocol is likely to fail.

What is also a considerable fallacy in these estimations is their proximity to be achieved. Even in context of developing nations like India, the radar set is too high to achieve. Change in political setups, advancements and other factors influence the existing conditions high enough to cause considerable deliberation. So, the set parameters should also incline towards achievable standards.

The lack of accurate emission baselines creates an obstacle in determining whether participating states are meeting their Protocol commitments. Some signatories may have an advantage when 1990 baselines are chosen to assess emission rate changes. In nations such as Russia, where the national economic output has declined since 1990, GHG emissions may also have decreased [36]. This situation creates "head room" or "hot air" [37]. Conversely, the Protocol's use of 1990 emission levels as a baseline put burdens on some countries, like the United States. A further impediment to the Protocol's efficacy may be leakage, a phenomenon which occurs when businesses move their working and accompanying emissions to unregulated countries to avoid the expenses of obtaining emission-reduction technology. Essentially, even if the Annex I countries reduce overall emissions, those emissions may resurface elsewhere, as Non-Annex I countries avail the economic benefits of leakage.

In addition to this, developing countries argue that they do not have adequate resources even to meet their basic human needs and livelihood. In such circumstances climate mitigation will bring additional strain to the already fragile economies of India and other developing countries. It is apparent that developing countries have lower per capita income and their contribution to the greenhouse gases concentration is very little as compared to the industrialized nations. But in the present scenario, situation has changed a little and fast growing developing countries per capita emission level of China and India has increased. It is the fact that developed countries are historically responsible for emission concentrations which contribute the global warming.

Developing countries further argue that the socio-economic development and poverty eradication are the most important elements of environment protection and for maintaining ecological balance. The efforts are being made by the developing countries to reduce the emission of greenhouse gases but the efforts

made by them are not sufficient. Moreover, at the same time they are fighting with pollution and other environmental degradation problems at their national level. Therefore, they are insisting the developed world to meet its commitments on emissions of greenhouse gases. They have also pointed out the fact that developed and the developing countries should not be brought under one and the same category as far as reduction of harmful gas emission is concerned.

The major problems which are contributing the global warming and the climate change in our country are the population growth, industrialization, massive deforestation, vehicular pollution, etc. At the same time the efforts of the Indian government towards the climate change are being influenced by the international complex scenario towards the issue of global warming.

In India there is no specific law which deals with the problem of global warming. India is such a country which is having constitutional provisions for the protection of environment. There are legislations such as Air (Prevention and Control of Pollution) Act, 1981, Forest Conservation Act, 1980, Environment Protection Act, 1986, etc. for the environment protection but these legislations are the piecemeal legislations and are general in nature. They did not specifically deal with the problem of climate change, global warming and especially in reduction of GHGs.

Even though there are international efforts towards the hazard of climate change and global warming, hardly any effort was taken by the Indian government through legislations for curbing the situation of reduction of GHGs. It is apparent that the NAPCC has not made integrated efforts and co-ordinate with other policy and plans to reduce the carbon emission in India. There is no integrated policy and plans of the central government which deal with the threat of climate change.

Even the judiciary has shown the concern towards the problem of climate change where Hon'ble Apex Court in the landmark case of Indian Council for Enviro-Legal Action versus Union of India [38] observed, "If the mere enactment of laws relating to protection of environment was to ensure a clean and pollution free environment, then India would perhaps, be the least polluted country in the world. But this is not so. There are stated to be more than 200 Centre and State Statutes which have at least some concern with Environment Protection, Either directly or indirectly. The plethora of such enactments has unfortunately not resulted in preventing environment degradation, which on contrary, has increased over the years" [39]. It is apparent from the above observation of Supreme Court that by having only enactments and laws, the problem of environment degradation and climate change cannot be solved.

CONCLUSION AND SUGGESTIONS

South Asian countries are vulnerable to future disasters because of the problems population and poverty. The majority of them are low-or lower-middle income countries which struggle to support even the basic needs of their increasing population.

The rising sea level and low production in agriculture cause the biggest threats. Dhaka, Kolkata and Mumbai, whose greater urban areas are resided by over 46 million people, face the risk of deterioration caused by flood over the next century. Bangladesh which is a low-lying country is exposed to the threat of flooding and cyclones in the Indian Ocean, which is predicted to grow more intense in the future. In 1991, a 20-foot storm surge which occurred after a cyclone killed nearly 140,000 people in Bangladesh and made 10 million people homeless.

As shifting monsoons affect the amount of water available for irrigation, a reduction in the standard of living is all but guaranteed for a region that already is one of the world's most water-stressed. By mid-century, the IPCC projects that climate change will make South Asia home to the "largest numbers of food-insecure people."

So, it comes down to what we really need to ensure that environmental challenges are not posing a significant threat to the livelihood of each one of us, especially the farmers. It needs to be analyzed that the fallacies are corrected at ground level. Let's analyze them one by one.

The first thing which we should consider is the problem of smaller land holdings, it is not seen as a significant issue but when seen through the production issue along with the effect being caused to the land in use, it is the most crucial problem. The land suffers in terms of quality, and hence the production quality goes down, moreover the produce is very small, so sometimes all it does is to suffice itself for the personal consumption of the farmer's family. There is no issue to it not serving a commercial value; the problem is with the fact that the farmer must go to hunting for alternative sources of income. This big problem can be solved by simple consolidation of landholdings into bigger units and giving joint ownership to the farmers where they can employ distribution of the various works involved, also since profitable impetus has been seen through this mechanism, they can easily afford advanced ways of approaching farming and ensure that not only their personal needs are met, but also those of the market with improvised production quality.

The second problem faced is that of usage of bad methodologies in improvising production. Here in developing countries, we have high dependence on fertilizers to improve the production, we do not analyze the technology employed with respect to the need, we orient ourselves to just one dimension i.e., improving quantitative production and the mechanism fails terribly. Hence, here, what is needed is to reduce dependence on fertilizers and analyze the situation case sensitively. This means that the soil needs to be given resources to recover itself, along with ensuring that its components are restored more naturally. The technology devised by afforestry [40], shows that the land could be covered with layers of hay after water is supplied, to ensure that the water is effectively absorbed by the plants and not merely lost to evaporation. At the same time, it also showed that seeds were planted relatively closer than they are done; consequently, it grows with more productivity. Many other alternatives were also suggested by Afforestry, and along with the current research alternatives suggested by those researches, who are viewing this in the light of sustainable development, should be employed and better results will be ensured.

The third problem is with the adequacy of the environmental conditions available. Yes, pollution and deforestation are in true terms affecting the production capacity for the farmers. So, to a small extent, we need regulated weather conditions to ensure that the natural production is favorable. Here, we are not suggesting regulating the weather condition, but what we are suggesting is to ensure that the environmental conditions are not hampered as much as possible. This can be understood in a much better way via an example, for example the plantations in Himachal Pradesh are to be studied. Here, the existing policies should be as such that they regulate the environmental conditions are not hampered to affect the natural production of the crops grown in there. This also means ensuring that if more human settlement is occurring then, the regulating authority ensures that the waste produced has proper dumping facilities available, with separation of degradable and nondegradable substances, etc. States like Chhattisgarh in India faced rapid industrialization, especially cities like Raipur where sponge iron factories grew in numbers rapidly post state creation in 2000. This went rampant and un-regulated. The effect was seen on rice production, Chhattisgarh was called the rice bowl of India, however, the quality of rice available degraded. Moreover, being more objectively viewed from a commercial standpoint, the natural production suffered and who were the worst hit- the farmers. They felt the need to move to cities to find alternative sources of income, hence more workers in the city meant cheap labour, and this further meant more industrial undertakings coming into picture. We see this setup is very unidirectional. So, the need of hour is to regulate the direction of this circle towards more enhanced production mechanism, bringing it to such a standard point, that children in future, after studies should want to come back to farming. This can only be done if the right set of technological advancements is employed and the same is conveyed to the farmers.

Moreover, one suggestion would be to expand the U.S.-India Energy Dialogue to include all nations in the region and invite more

involvement and investment from American private enterprise. This collaboration could satisfy both the developing world's need for support, and the developed world's desire to promote their own renewable industries, especially farther up the production value chain.

For example, the advancements in battery technology being made by Tesla may greatly improve the storage of electricity generated from renewable sources. Developing countries including South Asian countries could use these new techniques to avoid building expensive power grid systems where smaller networks of battery-equipped solar facilities would be more appropriate, such as rural areas.

The absence of a 'cooperative regional framework' and ongoing disputes between the developing and developed countries are two of the most important factors which inhibits an effective response towards climate change induced problems such as decreased agricultural productivity in South Asian countries. Unfortunately, the cost of action will only rise if delayed. These problems could only be solved through strong "political will" and effective governance.

On a conclusive note, it can be said that there is a significant amount of work that needs to be done in ensuring better livelihood of farmers in South Asian Countries. The essence lies in ensuring that the intention behind principles of Sustainable Development is ensured, from the scratch. International instruments, national legal instruments do exist to mandate and understand as to what is it that we are looking to fulfill. However, in their realization to the level of implementation, there is a significant gap which needs to be first understood then realized. It can only be carried out if the way in which it is being viewed is changed, from a commercial stand point to a more practical one. Exploitation has rendered in the past for us facing two world wars, and who suffered? So, when the consequences are for all of us to face, then why look at things with exploitative eyes, and not a more understandable one. Hence, it needs to be ensured that the underlying intention behind the devised international principle of Sustainable Development is realized.

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