

**“A REPORT ON AGRARIAN CRISIS-FARMERS’ SUICIDE” IN INDIA:
AN ADVERSE IMPACT OF CLIMATE CHANGE**

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ABSTRACT

India is an agricultural dependent country and agriculture is the only source of livelihood for most of the population. Industrialization that resulted in to climate change, has affected the crop production to large extend by changing rain fall pattern. A warming climate and decreasing soil moisture can also result in increasing need for irrigation. Besides, natural calamities, floods & droughts have disastrous effect on agriculture. Decreased agricultural output has put pressure on farmers resulting in to increased rate of suicidal cases in India. This paper represents the scenario of agriculture in the era of climate change that has been adversely affecting the lives of the farmers who are under tremendous pressure due to economic stress. Some of the Government policies & suggestive measures have also been discussed to overcome this problem.

Keywords: Climate change, Global warming, Agrarian crisis, Green growth, Farmers suicide

I. INTRODUCTION

Climate of any area decides the patterns of natural ecosystems and the human economies and cultures that depend on them. In today’s world, climate is rapidly changing rapidly with disturbing impacts and that change is progressing faster than any seen in the last 2,000 years. This climate change results in global warming-an overall increase in earth’s temperature that further accountable for rising levels of carbon dioxide and other heat-trapping gases in the atmosphere have warmed the Earth and are causing wide-ranging impacts, including rising sea levels; melting snow and ice; more extreme heat events, fires and drought; and more extreme storms, rainfall and floods. Scientists project that these trends will continue and in some cases accelerate, posing significant risks to human health, our forests, agriculture, freshwater supplies, coastlines, and other natural resources that are vital to Washington state’s economy, environment, and our quality of life. Therefore, we see already climate change is happening faster than initially predicted, its incipient impacts are upon us all over the globe. India will not

be spared in these upheavals. Climate scientists predict cataclysmic physical changes for the subcontinent in the near future. Two-thirds of Indians are farmers. Most of them depend on Himalayan glacial runoff or the monsoon rains. Now both water sources are in danger due to global warming. The Himalayan ice pack is melting rapidly, while monsoon variability is increasing. This rapid climatic change has carried a devastating impact on agriculture all over the world. India is an agrarian country, 60% of its people depending directly or indirectly upon agriculture, changing climate has shattered the dreams of farmers who are losing their lives in the hands of nature. As per recent study, In India the problem of farmer suicides has assumed a serious proportion as suicide toll is increasing year after year. According to the National Crime Record Bureau (NCRB), as many as 5,650 farmers committed suicide in India last year. This works out to one farmer suicide in every 100 villages or one farmer suicide in every block in the country last year. State-wise, Maharashtra accounted for the highest number of farmer suicides (2568) distantly followed by Telangana (898), Madhya Pradesh (825), Chhattisgarh (443) and Karnataka (321). These five states together accounted for about 90 per cent of total farmer suicides. Maharashtra is by far the epicenter of the crisis, with over 10,000 recorded farm suicides between 2011 and 2013. More than 2,000 farmers' suicide cases were reported due to agrarian reasons in 2015 with highest number of 1,841 cases in Maharashtra alone, as per the data placed before Lok Sabha by Minister of State for Agriculture Mohanbhai Kundariya.

Climate change has not only trapped Indian agriculture; it has affected other developing nations like China to a large extent. In a study, it was observed that in China, when moisture is reduced by 1%, the irrigated area is reduced by more than 1%, causing a serious impact on China's food production. The yield of frigid crops in most of the northern regions will also decrease considerably and the forage growth in drought or semi-drought areas will reduce as well (Kim Chang-gil *et al.*, 2009).

II. DATA COLLECTION

All the factors discussed in this paper representing the real cause for agrarian crisis are subjected to opinions, suggestions, findings & observations of scientists, workers, analyst & print media who have critical analyzed the situation in context to economic stress in India.

III. DISCUSSION

A. Impact of climate change on agriculture

It was no less than the Inter-Government Panel on Climate Change that mentioned in its report of 2007 that India's climate "has undergone significant changes showing increasing trends in annual temperature with an average of 0.56°C rise over last 100 years". Further, that warming

was more pronounced during the post-monsoon and winter season with an increase in the number of hotter days in a year. The report further predicted, "The country is likely to experience frequently occurring extreme events like heat and cold waves, heavy tropical cyclones, frosts, droughts and floods".

Climate has direct as well as indirect effects on agriculture. It directly effects the physiology & morphology of the crop growth. Indirectly, it effects the fertility of soil, irrigation, pest, floods & droughts that finally results in to socio-economic impacts. As per IPCC, increased temperature can increase the insect outbreaks impacting agriculture, forestry & ecosystem. Sinha and Swaminathan (1991) – showed that an increase of 2°C in temperature could decrease the rice yield by about 0.75 ton/ha in the high yield areas; and a 0.5°C increase in winter temperature would reduce wheat yield by 0.45 ton/ha. Aggarwal *et al*, (2002) on basis of recent climate change scenarios estimated impacts on wheat and other cereal crops. They found out that soybean yields could go up by as much as 50 per cent if the concentration of carbon dioxide in the atmosphere doubles. If this increase in carbon dioxide is accompanied by an increase in temperature, as expected, then soybean yields could actually decrease. If the maximum and minimum temperatures go up by 1°C and 1.5°C respectively, the gain in yield comes down to 35 per cent. Hence, we see increased temperature could carry a positive impact on agricultural production by increasing productivity due to increased CO₂ production. It also reduces the heating cost for protected crops. Increase temperature may enhance the chances of growing new crop varieties. On the contrary, excessive increase reduces the agricultural yield, increases the weed & pest, changing rain fall pattern, results in to droughts & soil erosion. Negative impacts of climate change always overweigh the positive impacts that makes climate change a very negative factor for agricultural sector.

B. Impact of agriculture on climate change

In modern agriculture, synthetic fertilizers have been used to boost up the agricultural production. These nitrogen based fertilizers are responsible for the emission of green house gases (GHGs). Burning of fossil fuels also emit GHGs in to the atmosphere that contribute to climate change. Animals produce and emit large amounts of methane while digesting fodder. Also, due to increasing population, urbanization & industrialization, a large number of forest cover has been cleared to provide land for agriculture, human settlement and for industries. Hence, we have removed the major 'carbon sinks' that absorbs the radiations emitted by sun & re-emitted back from the earth surface. It has been estimated that 20% reduction in the global area of forests during the last 140 years releasing about 120 GTC to the atmosphere.

C. Impact of climate change on farmer's lives

Various reasons have been offered to explain why farmers commit suicide in India, including: floods, drought, debt, use of genetically modified seed, public health and government economic policies. There is no consensus on what the main causes might be but studies show suicide victims are motivated by more than one cause, on average three or more causes for committing suicide (Mishra, 2007; Behere, 2008; Stone, 2007). Panagariya states, "farm-related reasons get cited only approximately 25 percent of the time as reasons for suicide" and "studies do consistently show greater debt burden and greater reliance on informal sources of credit" amongst farmers who commit suicide. A study conducted in 2014 found that there are three specific characteristics associated with high risk farmers: "those that grow cash crops such as coffee and cotton; those with 'marginal' farms of less than one hectare; and those with debts of 300 Rupees or more" (Panagariya, 2008). The study also found that the Indian states in which these three characteristics are most common had the highest suicide rates and also accounted for "almost 75% of the variability in state-level suicides" (Kennedy & King, 2014).

In Punjab, the destruction of almost two-thirds of the state's cotton crop by the whitefly has forced 15 farmers to commit suicide, pushed hundreds of others into debt in year of 2015. A *Times of India* report cited a farmer from Bhatinda likening the destruction caused by the pest to the airstrike by the Japanese navy on Pearl Harbour, the attack that drew the US into World War II. The extent of the devastation has left many agricultural scientists in the state puzzled given that the whitefly is common to cotton farms across Punjab. The whitefly incident describes best the story of all that is going wrong with the agro-ecology of a state that was once described as the food bowl of India.

Recently in 2017, suicides by farmers are continuing to shake rural Punjab despite the loan waiver promise by the state's new government. At least 21 farmers, who owed money to banks, co-operative societies or middlemen, have ended their lives in between April 1 to May 15 this year (2017), The Indian Express has found. The incident this year, should also serve as a wake-up call to the state and its policymakers to the realities of climate change which, mixed with bad ecological policies, can wreak havoc on a state's economy. Of course, no one incident can be linked to climate change, but science does tell us that longer summers, shorter winters and freak weather conditions will be the symptoms of human-induced climate change. Combined with the heavy use of genetically modified crops that are not immune to pests such as the whitefly, it is but obvious that Punjab's cotton farmers are now facing a crisis that has been forcing them to end their lives.

In another observation, Bt cotton (*Bacillus thuringiensis* cotton) was claimed to be responsible for farmer suicides (New York Times, 2006). The Bt cotton seeds cost nearly twice as much as ordinary ones. The higher costs forced many farmers into taking ever-larger loans, often from

private moneylenders charging exorbitant interest rates (60% a year). The moneylender was claimed to collect his dues at harvest time, by compelling farmers to sell their cotton to him at a price lower than it fetches on the market. According to activists, this created a source of debt and economic stress, ultimately suicides, among farmers. Scholars claim that this Bt cotton theory made certain assumptions and ignored field reality.

IV. REMEDIAL MEASURES

Though climate change has affected the agricultural sector to a large extent; still there are some remedial measures whose implementation at right time in the right way could be beneficial in minimizing the agricultural crisis & approach towards sustainable agricultural development. Some of the strategies like crop rotation, changing planting pattern, genetically engineered disease resistant & drought resistant crop varieties, using intensive irrigation methods, by increasing soil fertility, use of biofertilizers & biopesticides, lay farming, strip cropping, mulching, vermicomposting - are cost effective & green growth technologies, could enhance the agricultural yield if implemented efficiently. Reduction in the GHGs emissions could be an intelligent method to control the climate change.

Women farmers in Jhajjar decided not to use any pesticide against whitefly but just homemade spray, which has been efficient in protecting their crops and helped them avert the crisis. The whitefly incident should caution agricultural scientists across Punjab to factor in climate change, and start advocating options such as multi-cropping in a state which is in the midst of an agrarian crisis. Government must make strong strategies to subsidize the crop seeds & other agricultural items to farmers at very reasonable rates. Agricultural loans need to be more flexible for farmers in country like India, that is known as 'Agrarian country'.

As farmer suicides are a matter of grave concern for a fast developing country and a challenge to the well-planned existing financial infrastructure, there has to be some responsibility assigned to the officials of the concerned area where the suicides occur. Therefore, local revenue officials at the village and block level should be entrusted with the responsibility of making enquiry about the financial health of identified farmers based on EWSF and including private loans of the farmer's family. If state Governments take the responsibility of handling the agricultural issues or other catastrophic situations at their own level, the effectiveness of the policies/strategies could be more fruitful for both the farmers & the Nation.

V. CONCLUSION

It has been concluded that the adoption of alternative crops to suit different weather models, a strategy that may help immensely in times of poor monsoon/changing climate. More stress on

green growth in the agriculture sector could be achieved through a shift in agricultural practice that takes into account the environmental capacity of each different region and the water system, low-carbon agriculture via greenhouse gas reduction and higher absorption capacity, and energy efficiency and savings. Financial supports to farmers at less interest rates & liberal strategies could be helpful in sharing the burden of farmers in state of agricultural crisis and reducing economic stress & suicide rate in India.

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