

# NATURAL CALAMATIES HAS BECOME A CAUSE OF FEAR FOR THE FARMERS AND FOR THE PRODUCTION OF VARIETY OF CROPS

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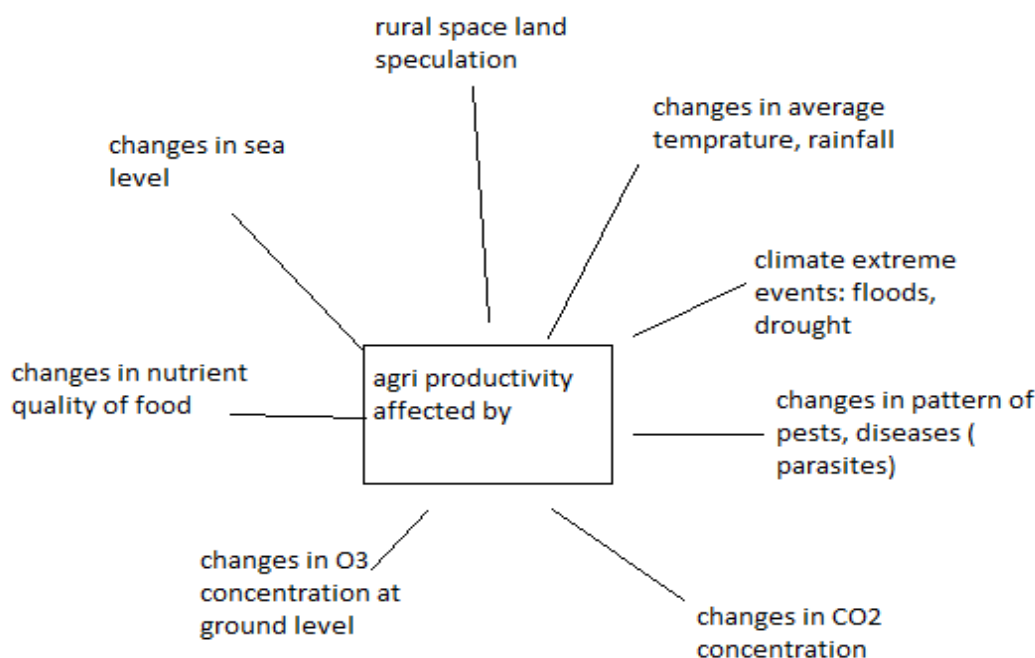
**KEYWORDS:** Exhaustion, whimsical, Evapotranspiration, inundated, cloudburst, brumal, gradual.

Global warming is the biggest problem in this century. It has posed a great threat to the existing environment in which a serious kind of climate disorder is being found. The increase in the average temperature in the atmosphere and the rise of sea-level taking place for the past few centuries have been named as global warming.

The ever increasing density of CO<sub>2</sub> in the atmosphere happens to be at the root of green house to be at the root of green house effect paving the way for global warming. There had been changes in temperature more often than not while the earth had long been in the process of its natural evolution. In this automation based modern civilization, different kinds of Reckless human activities, excessive exhaustion of fossil fuels, industrialization, urbanization, deforestation, etc. pose green house gases that make temperature rise in the atmosphere. As a result, of this, our planet is gradually on its way to destruction.

Global warming has brought about serious impacts in India .The people of India have been suffering from the evil effect of global warming. In the days to come, this suffering is likely to be much more. In 2000, the quantity of green house gases in India grew up, and it reached up to 4.47% of the entire earth.

In Asia , India its such a country as depends on agriculture and 50% Indian are directly or indirectly engaged in farming. Agriculture is one of the most important subject of dependence for the Indian people. For the past few centuries. Serious impacts of global warming as well as climatic changes on agriculture in India have been in full view. Farming activities in India have come to face many adverse circumstances owing to gradual rise of temperature, whimsical monsoon, excessive rainfall, drought, flood, rise of sea-level, cyclonic storms etc.



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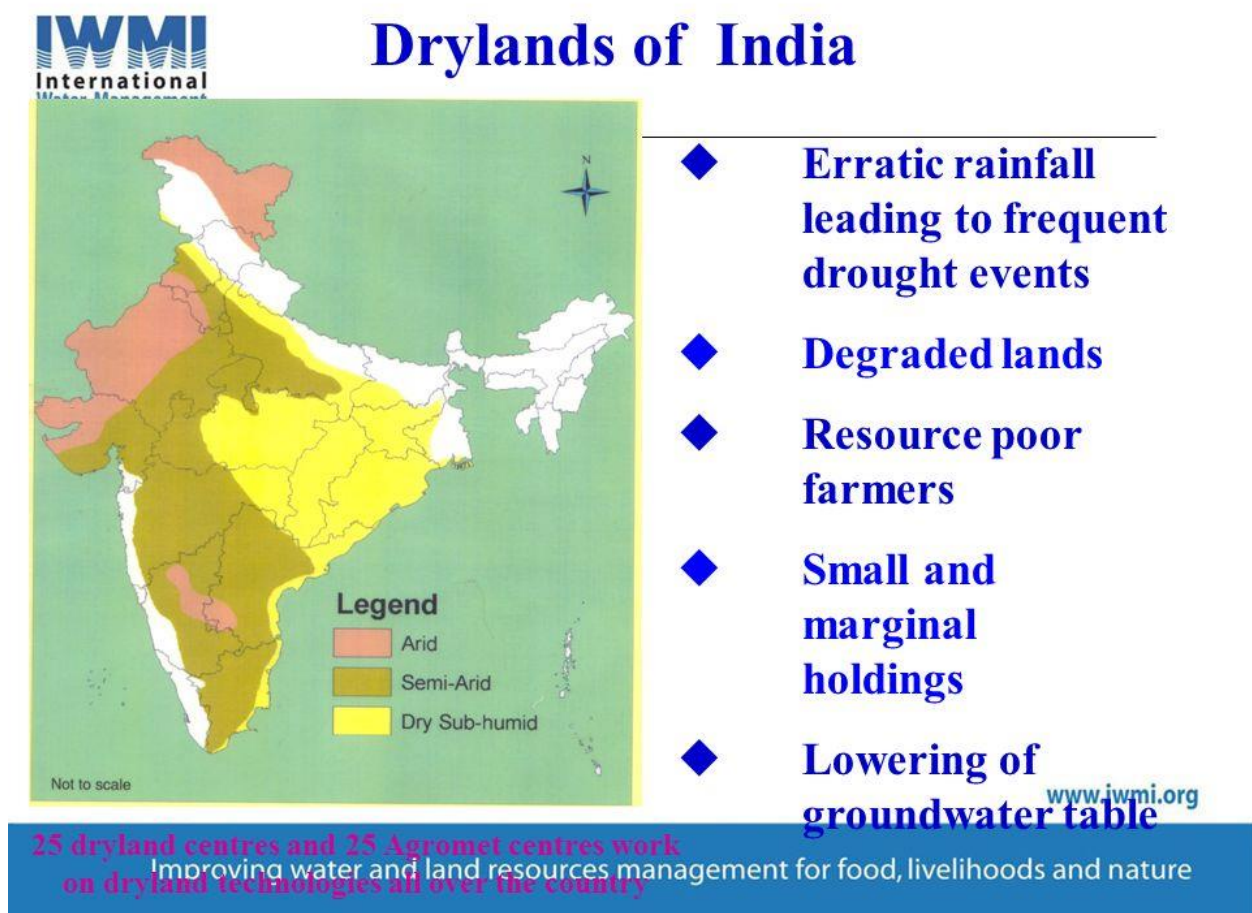
Climatic changes can affect crop growth quality, live stock health, farming practice etc.

India with her most of the people being engaged in agronomy ranges 15% GDP from agriculture sector. But owing to the climatic change India has to suffer a GDP loss of 1.5%

About 80% farming activities in India depend upon monsoon rains. But the nature of the monsoon rains because of the climatic changes, excessive rainfall and droughtiness have made Indian agriculture face a lot of challenges. The production of rainy season crops is likely to have 40% fall by the year 2080 in the wake of the gradual increase in the surface temperature. The wheat production will dangerously come down to such a pitiful state that hundreds of people fall prey to starvation.

According to reports, the rise of excessive temperature has reduced a farmer's income to 4.3% and the excessive rainfall has reduced it to 13.7%. The excessive rise of temperature has reduced a farmer's income to 6.2% in those regions where there is no facility of water supply for agriculture. For the past 25 years, it has been noticed in North India, that because of the increase of 1 degree Celsius the production of brumal crops has undergone noticeable changes. Scantiness of brumal rainfall, shifting of cultivation zones of fruits, growing dryness of the ever flowing rivers have evil impact on fruits production in north India.

There is no water-supply facility for agriculture in many regions prone to droughtiness . These regions are the worst-hit as far as farming there concerned.



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The ever-increasing greenhouse gases and the climatic changes have far reaching consequences on the agricultural production, and they have posted a great threat to food safety in India . Dissatisfactory rainfall in Jharkhand , Chattisgarh , Orissa, West Bengal has had its damaging impacts on paddy production . Because of the rise of the excessive density of CO<sub>2</sub> in the atmosphere, the average temperature is likely to go up upto 2.33 degree Celsius - 4.7 degree Celsius . In that case, there will be radical changes in summer monsoon precipitation, the result of which is going to be fatal as far as the agricultural production in India is concerned. As a result the production of paddy is falling about 40% every year in these regions. The rise of temperature by 1degree Celsius has noticeably reduced the production of Soyabean, mustard and wheat. By the year 2030, the production of paddy and wheat is likely to come down to 6-10% . From 2 degree Celsius to 4.5 degree Celsius temperature rise has affected the wheat belts of Haryana and the Punjab where the wheat production is not up to the satisfaction ( Prasada et al, 2010)Gradual rise of temperature has reduced the production of pearl millet in Rajasthan and soybean in Madhya Pradesh.

**Table 11: Impact of climate change on rainfed agriculture in India**

Crops	Per cent loss of normal yield
Sorghum	43.03
Maize	14.09
Tur	28.23
Groundnut	34.09
Wheat	48.68
Onion	29.56
Cotton	59.96

Asha latha *et al.*, 2012

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Source- [https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange2014-151212052621%2F95%2Fclimate-change-and-its-effect-on-field-crops-48-638.jpg%3Fcb%3D1449898022&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2FNagarjun009%2Fclimate-change-and-its-effect-on-field-crops&docid=5LiBcGoQBj0I5M&tbnid=wb4i68Jw7\\_PP1M%3A&w=638&h=479&source=sh%2Fx%2Fim](https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange2014-151212052621%2F95%2Fclimate-change-and-its-effect-on-field-crops-48-638.jpg%3Fcb%3D1449898022&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2FNagarjun009%2Fclimate-change-and-its-effect-on-field-crops&docid=5LiBcGoQBj0I5M&tbnid=wb4i68Jw7_PP1M%3A&w=638&h=479&source=sh%2Fx%2Fim)

Some feed and forage are produced owing to the increase of CO<sub>2</sub>, But these are of little nutritional value.

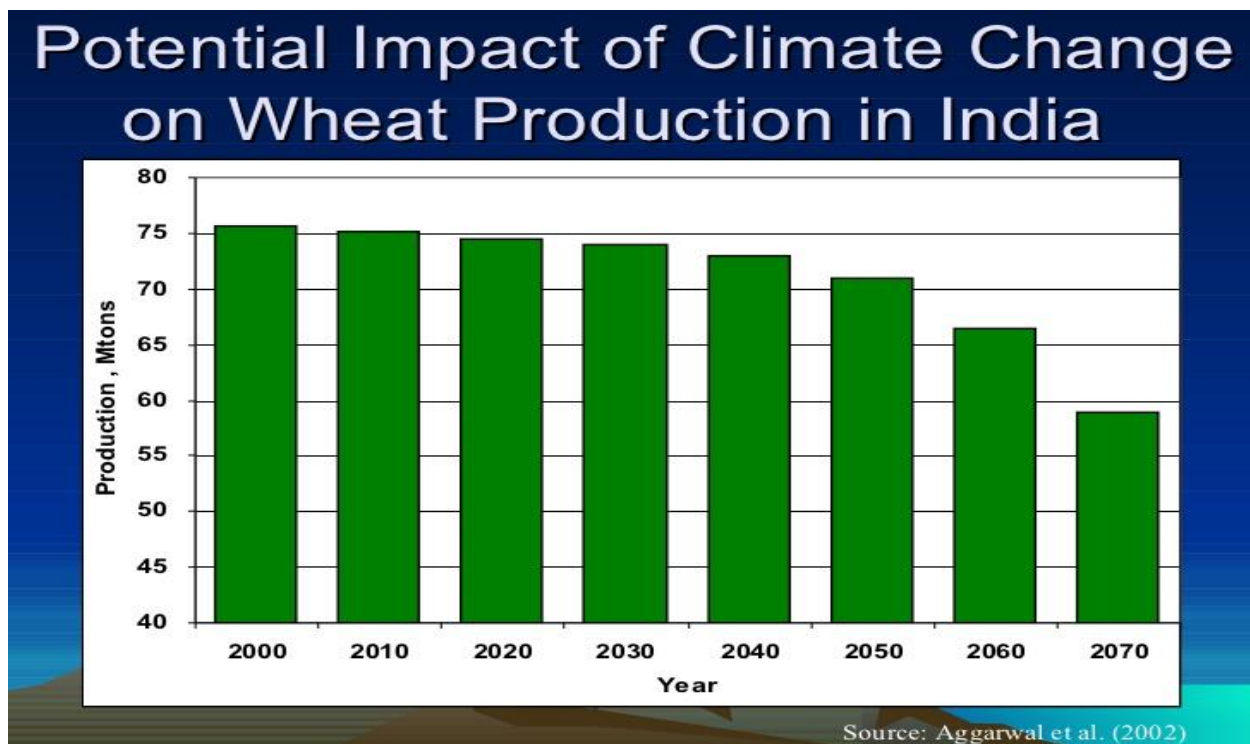
**Table 8: Climate Change and Crop Productivity Temperature Effects on Crop Yield – Several Major Crops**

Crop	T opt °C	T max °C	Yield at T opt t/ha	Yield at 28° t/ha	Yield at 32° C t/ha	% decrease (28 to 32° C)
Rice	25	36	7.55	6.31	2.93	54
Soya bean	28	39	3.41	3.41	3.06	10
Dry bean	22	32	2.87	1.39	0.00	100
Peanut	25	40	3.38	3.22	2.58	20
Grain sorghum	26	35	12.24	11.75	6.95	41

G.G.S N Rao, 2008

Source- [https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange2014-151212052621%2F95%2Fclimate-change-and-its-effect-on-field-crops-45-638.jpg%3Fcb%3D1449898022&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2FNagarjun009%2Fclimate-change-and-its-effect-on-field-crops&docid=5LiBcGoQBj0I5M&tbnid=\\_YQ-8vT5Pg8Igm&w=638&h=479&source=sh%2Fx%2Fim](https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange2014-151212052621%2F95%2Fclimate-change-and-its-effect-on-field-crops-45-638.jpg%3Fcb%3D1449898022&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2FNagarjun009%2Fclimate-change-and-its-effect-on-field-crops&docid=5LiBcGoQBj0I5M&tbnid=_YQ-8vT5Pg8Igm&w=638&h=479&source=sh%2Fx%2Fim)

Crop evapotranspiration have directly impacted by climatic change. In the dry regions of Rajasthan it has gone up to 14.8% and it is likely to leave evil impact on the production of wheat and other crops.



Source- <https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fbiswajit-seminar-1228473169705030-9%2F95%2Fglobal-climate-change-its-impact-on-indian-agriculture-18-728.jpg%3Fcb%3D1228444342&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2Fsoumyashree85%2Fglobal-climate-change-its-impact-on-indian-agriculture-presentation&docid=TqO2UcqOLHMfDM&tbnid=Q2FiAPthSpaRIM%3A&w=728&h=546&source=sh%2Fx%2Fim>

**Table 6 : Cardinal temperature points for different crops**

Crops	Minimum (° C)	Maximum(° C)	Optimum (° C)
wheat	3-4.5	30-32	25
Barley	3-4.5	38-40	20
Oat	4-5	30	25
Maize	8-10	40-44	32-35
Sorghum	8-10	40	32-35
Rice	10-12	36-38	30-32
Tobacco	13-14	35	28

Source- [https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange-130706044606-phpapp02%2F95%2Fclimate-change-on-agriculture-22-638.jpg%3Fcb%3D1373086093&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2Fsanjuhr%2Fclimate-change-23967134&docid=9JBscFBMUqKbDM&tbnid=YKOAb3F\\_5-p3WWM&w=638&h=479&source=sh%2Fx%2Fim](https://images.google.com/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fclimatechange-130706044606-phpapp02%2F95%2Fclimate-change-on-agriculture-22-638.jpg%3Fcb%3D1373086093&imgrefurl=https%3A%2F%2Fwww.slideshare.net%2Fsanjuhr%2Fclimate-change-23967134&docid=9JBscFBMUqKbDM&tbnid=YKOAb3F_5-p3WWM&w=638&h=479&source=sh%2Fx%2Fim)

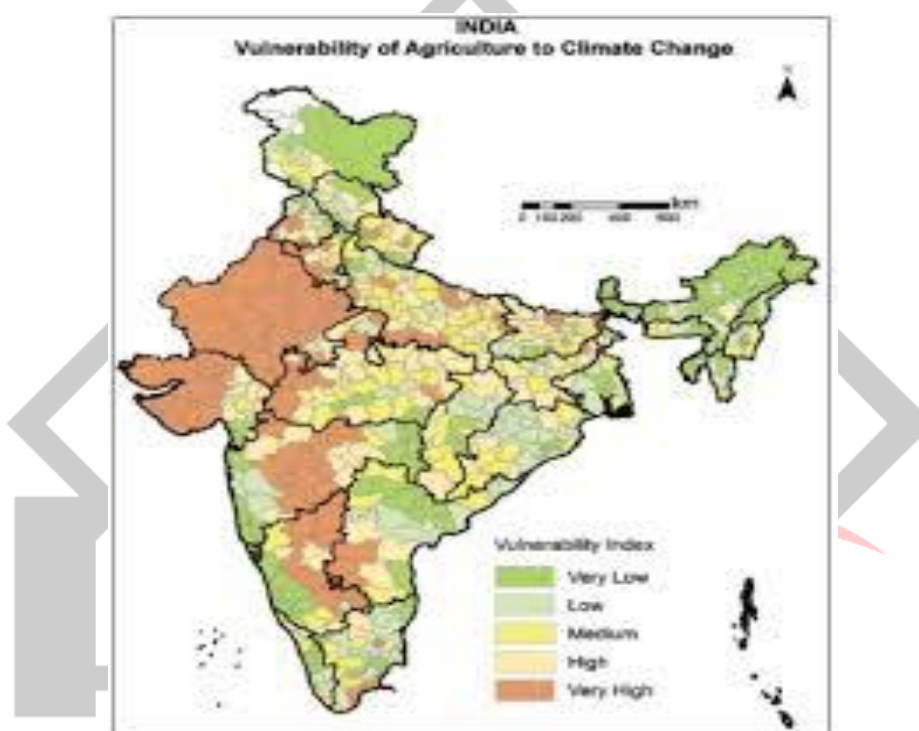
Flood or drought has become very common in India in the wake of frequent changes in the climate. Every year, the farmers have to count heavy losses because their Production and farming land are getting damaged . In India flood damages crops of as much as

3.7 million hectares of farming land every year, ( Andhra Pradesh). A huge area of farming land and crops were damaged and people had to suffer the worst in 2005

in Maharashtra( Chiplun , Kalyan, Ratnagiri) in 2008 in Bihar ( Supaul, Araria, Champaran, Purnea) in 2009 in north east of India, Orissa and Gujarat also. In Uttar Pradesh as much as 500,000 hectares of farming land having been inundated and seriously affected . Thereafter, this disaster fatally affected the production of wheat in the Punjab and Haryana. Unseasonal rainfall at Sangli in Maharashtra damaged 11,851 hectares of farming land, and Satara the production of wheat, Jowar, Chana, strawberry etc. of about 253 hectares of land was seriously affected. In 2010, a huge quantity of paddy was damaged in Pudukottai (Tamil Nadu) because of heavy rainfall. Besides incessant rainfall caused havoc throughout the farming land of Andhra Pradesh .

The frequent rise in temperature together with climatic changes has given birth to crop-destroying pests making the plants diseases and damaging crops.

The rise of greenhouse gases make cyclonic storms break out frequently in the costal areas of India. The agricultural lands in Gujarat , Andhra Pradesh and Sundarbans lose fertility because of the inundation by salty water. On many occasions crops are also damaged. Mention may be made of 'Ila' that caused serious damages to both crops and agriculture lands in 2009 in the Sundarbans . In India, there about 800 km coastline that has to experience frequent cyclone from the Bay of Bengal and the Arabian sea as well almost every year. Consequently farming lands lying across the coastline are damaged every year.



Source- [https://images.google.com/imgres?imgurl=https%3A%2F%2Fwww.orfonline.org%2Fwp-content%2Fuploads%2F2016%2F09%2Fmap2.jpg&imgrefurl=https%3A%2F%2Fwww.orfonline.org%2Fresearch%2Fclimate-change-and-food-security-in-india%2F&docid=iN\\_z7r8J1j0TBM&tbid=cW5oULdGBCOrWM%3A&w=443&h=515&source=sh%2Fx%2Fim](https://images.google.com/imgres?imgurl=https%3A%2F%2Fwww.orfonline.org%2Fwp-content%2Fuploads%2F2016%2F09%2Fmap2.jpg&imgrefurl=https%3A%2F%2Fwww.orfonline.org%2Fresearch%2Fclimate-change-and-food-security-in-india%2F&docid=iN_z7r8J1j0TBM&tbid=cW5oULdGBCOrWM%3A&w=443&h=515&source=sh%2Fx%2Fim)

Increase in temperature and climatic changes have left negative impacts on the agriculture of India. This has made the Indian peasantry utterly hope less . Every year from different parts of the county suicides committed by the farmers are reported. Dissatisfactory production of crops, poor quality livelihood, extreme poverty of the farmers as making the farmers hopeless, and all these drive many of them to commit suicide .

Advancing cropping seasons , irregulars rainfall, changes in the flowering behavior of plants, Erratic rainfall, increase in temperature, change of direction of many rivers have added much bad effects is the dissatisfactory agricultural production across north India. In June , 2013, the outbreak of flash flood damaged farming land and crops on a large scale in Uttarakhand.

In Uttarakhand as much as 40 kinds of crops including Oil-seeds millets etc. are produced .But the ever- running climate changes have affected badly on the crop-diversity in that region. Moisturelessness of soil, excessively hot summer, increasing cloudburst etc. unusual scanty snowfall, have left negative effects on agriculture across the Himalayan range. These are going up day by day.

The cultivation of apple across the Himalayan regions has been undergoing changes due to the ever increasing temperature. As a result, the apple farmers are being forced to shift the apple belt to Kulu valley which is a highlying valley because the favorable climatic conditions happen to be unavoidable in the lowlying valley.

So far as reports are concerned, the change in climate in the district of Rudraprayag has seriously affected crop-diversity , productivity and food security.

Therefore , it is possible to say that global warming along with climatic changes has left far-reaching consequences on the public life as well as the agriculture of India. Needless to say, agriculture is the backbone of India. Many industries in India being based on agriculture, Indian economy is facing a lot of challenges. Because of their agricultural based life-style, the frustrated farmers are committing suicide. This is not all expected. The people of India must come forward so as to build proper infrastructure for agriculture . The exhaustion of fossil fuels must be reduced so as to avoid emission of greenhouse gases. Proper and suitable arrangement of disaster management must be done . The farmers must be encouraged in their works. Only then, India can have a substantive progress.

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