Climate change, Agricultural Practices and Food Security: An analysis of the Indian Scenario with Special Reference to the Food Security Act, 2013

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Abstract

The undesirable effects of climate change are anticipated to affect the populations with the least capacity to adjust, but with the highest need for improved agricultural performance to achieve food security and decrease poverty. Food security is a condition related to the supply of food, and individuals' access to it. Concerns over food security have existed throughout antiquity. The necessity to challenge climate change while producing more food to feed the world's growing population means that "climate-smart agriculture" (CSA) is one of the advocated ways forward. This method principally defends an agriculture that sustainably increases productivity, resilience. This will concurrently help meet the goals of food security and overall development. This also envisages transformation of agriculture to feed a growing population in the face of a changing climate without destroying the natural resource base pointedly and alleviate the negative effects of climate change. However, more productive and resilient agriculture will require improved management of natural resources, such as land, water, soil and genetic resources through practices such as conservation agriculture, integrated pest management, agro-forestry and sustainable diets. Climate change hovers production's stability and productivity. In several areas of the world where agricultural productivity is already low and the means of coping with adverse events are limited, climate change is expected to reduce productivity to even lower levels and make production more irregular. Long term changes in the outlines of temperature and precipitation, that are part of climate change, are expected to move production seasons, pest and disease patterns, and modify the set of viable crops affecting production, prices, incomes and eventually, livings and lives. India is no exception to the changing climate patterns and global warming. With its ever-rising population the need for food security is a greater burden. India's population and the enactment of Food Security Act, 2013 imposes obligation on the government to improve agricultural practices to feed billions of people. Unfortunately, the Act does not mention the concept of climate smart agriculture nor the ways to deal with food security in the light of climate change, to deal with the challenges which it must meet successfully.

The purpose of this paper is to examine the concept and relationship between climate change and agricultural practices related to climate smart agriculture; to evaluate the concept of climate smart agriculture in the international context; to analyse the Food Security Act, 2013 critically from the perspective of climate change and productivity development; and finally, to put forth suggestions to deal with the challenge in the present day context. The study is purely doctrinal with material collected from primary and secondary sources.

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1. Introduction

Food security is a condition related to the supply of food, and individuals' access to it. Concerns over food security have existed throughout history. There is evidence of granaries being in use over 10,000 years ago, with central authorities in civilizations including Ancient China and Ancient Egypt being known to release food from storage in times of famine. At the 1974 World Food Conference the term "food security" was defined with an emphasis on supply. Food security, they said, is the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". Later definitions added demand and access issues to the definition. The final report of the 1996 World Food Summit states that food security" exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.[2]

In this context, many researchers, decision-makers, land use planners and civil society actors increasingly believe that the interaction between climate change and food security will be one of the biggest challenges for the coming decades. By the year 2025, 83% of the expected global population of 8.5 billion will be living in developing countries, where most of the poor are living, and the resources are vulnerable to climate change. Yet the capacity of available resources and technologies to meet the demands of growing population remains uncertain. Presently, close to one billion people are already suffering from hunger worldwide and the future is daunting too food needs are projected to increase by 70 % by 2050 when the global population reaches nine billion, while climate change is projected to reduce global average yields, among other severe consequences. Within this perspective, many believe that agriculture must become central to future climate-change and food security governance.

This is on account of at least three important interrelated aspects:

Firstly, agriculture is the sector most vulnerable to climate change and many threats, including the reduction of agricultural productivity, production stability and incomes in many areas of the world already characterized by high levels of food insecurity and limited means of coping with adverse climate impacts. Moreover, climate change will affect

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[2] Ashish Sharma, A Geographical Study of Food Security and Agriculture in India, *International Journal of Science, Engineering and Technology,* 324, (2016,Volume 4 Issue 1)

agriculture through higher temperatures, greater crop water demand, more variable rainfall and extreme climate events such as heat waves, floods and droughts. Many impact studies point to severe crop yield reductions in the next decades without strong adaptation measures, especially in areas where rural households are highly dependent on agriculture and farming systems are highly sensitive to inclement climate;

Secondly, agriculture contributes a "significant" proportion of global carbon dioxide and nitrous oxide emissions (about 14 % of emissions according to current estimations; and

Thirdly, agriculture can be a major part of the solution: helping people to feed themselves and adapt to changing conditions while mitigating impacts of climate change (carbon sequestration). This mitigation potential can be largely achieved in developing countries such as conservation agriculture, integrated pest management, agro-forestry and sustainable diets.[3]

The purpose of this paper is to examine the concept and relationship between climate change and agricultural practices related to climate smart agriculture; to evaluate the concept of climate smart agriculture in the international context; to analyse the Food Security Act, 2013 critically from the perspective of climate change and productivity development; and finally, to put forth suggestions to deal with the challenge in the present-day context.

2. Concept of Climate Change, Climate Smart Agriculture and Food Security and Their Inter-Relationship

The poor population in developing countries will be particularly impacted by this delicate environmental problem, of which developed – and currently emergent – countries are the major drivers. In addition, food security, poverty and climate change are closely linked challenges and should not be considered separately. In countries where the economic and human development strategies are heavily based on agriculture, the development of agricultural sector, with a clearer distribution potential, remains an efficient poverty reduction policy. Yet agricultural expansion for food production and economic development which comes at the expense of soil, water, biodiversity or forests, environment, conflicts with other global and national goals, often compromises production and sound development in the longer term. It is true that over the past six decades, in world agriculture, climate change fundamentally alters the constraints and opportunities for transforming agricultural systems. The increased frequency and intensity of

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[3] Mohamed Behnassi, Mohamed Boussaid et.al., Achieving Food Security in a Changing Climate: The Potential of Climate-Smart Agriculture, 27. *Full paper available at www.springer.com/cda/content/document/cda.../9783319057675-c2.pdf?SGWID.* Last visited on 30.11.2017.

climate shocks is already mandating greater attention to resilience in production and social systems and better means of risk management. Uncertainty about the scale and nature of changes that climate change will impose affects the way we approach planning and investment. The green revolution in India was considerably, more efficient, especially in the 1960s. Improvements in production systems and crop and livestock breeding programs have resulted in a doubling of food production while increasing the amount of agricultural land by 10 %. However, projections based on population growth and food consumption indicate that agricultural production will need to increase substantially to meet future demands. Most estimates also indicate that climate change is likely to reduce the significant agricultural productivity, production stability and incomes in some areas already suffering from food insecurity, high rates of poverty, and feeble adaptive capacities to cope with adverse climate impacts. Increases in emissions that could be expected under conventional agricultural growth strategies associated with efficiency losses, mandate a major shift in focus to increasing resource-use efficiency as a basis for achieving needed growth. The following sections of this paper provide evidence on the projected impacts of climate change on agricultural systems and the implications they have for the way we develop and implement strategies of sustainable agricultural growth for food security.[4]

2.1. Climate Change

Climate change is no more an environmental concern. It has emerged as the biggest developmental challenge for the planet. Its economic impacts, particularly on the poor, make it a major governance issue as well. The Framework for this just and effective global climate deal is as follows:

Industrialised countries have managed to de-link sulphur dioxide emissions from economic growth. In other words, emissions have fallen even as national income has risen. But they have failed to do the same with carbon dioxide (CO2) emissions. Per capita CO2 emissions remain closely related to a country's level of economic development, and thus standard of living. It is evident that as long as the world economy is carbon-based – driven by energy from coal, oil, and natural gas – growth cannot be de-linked substantially from CO2 emissions.[5]

The only way to avert climate change is to reduce emissions dramatically. But things are never quite this simple. The use of fossil fuels (the major reason for CO2 emissions) is closely linked to economic growth

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[4] Philip Thornton, Leslie Lipper, How does Climate Change Alter Agricultural Promises, 1(2014). Read full paper at *https//papers.ssrn.com>sol3>papers*, last visited on 03.12.2019

[5] Supra n. 2 at 28, 29

and lifestyle. Every human being contributes to the CO2 concentrations in the atmosphere. However, the person's lifestyle decides the amount that is emitted. The more prosperous a country's economy is, higher is its fossil fuel consumption, resulting in higher greenhouse gas emissions.[6]

Industrialised countries owe their current prosperity to years of 'historical' emissions, which have accumulated in the atmosphere since the start of the industrial revolution. They still emit more to sustain this growth. Developing countries have only recently set out on the path of industrialization. That is the reason why their per capita emissions are still comparatively low. Under these circumstances any limit on CO2 emissions amounts to a limit on economic growth. This has turned climate change mitigation into an intensely political issue. International negotiations under the UN Framework Convention on Climate Change (UNFCCC, popularly referred to as the Kyoto Protocol) – aimed at limiting greenhouse gas emissions into the atmosphere – have turned into a tug of war with rich countries unwilling to 'compromise their lifestyles' and poor countries unwilling to accept a premature cap on their right to basic development.[7]

2.2. Climate Smart Agriculture

It is also true that human societies, over the centuries, have developed the capacity to adapt farming practices to environmental change and climate variability. These adaptations include, among others, practicing shifting cultivation, adopting high yielding, and new crop varieties tolerant to salts and drought and modifying grazing patterns. But today the speed and intensity of climate change are outpacing autonomous actions and threaten the ability of poor smallholders and rural societies to cope. For most of the one billion extremely poor and hungry people who live in the rural areas of major developing countries, agriculture remains the principal income source. These people are already vulnerable, and climate change will in most cases deepen their vulnerability. More specifically, and in countries most reliant on rain-fed agriculture and natural resources, poor rural women, who are often the primary food producers, have fewer assets and less decision-making power, are even more exposed than men. Therefore, ensuring food security under a changing climate should be considered as one of the major challenges of our era, especially that many countries' agriculture. It is highly vulnerable to negative impacts of climate change. Even using optimistic lower-end projections of temperature rise, climate change may reduce crop yields by 10–20 % by the 2050s, with more severe losses in some regions. World food prices for some of the main grain crops are likely to rise sharply in the first half of the twenty-first century, unlike the price declines witnessed in the twentieth century. Under a pessimistic high-end projection

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[6] *Id*..at 28,29,30
[7] *Id*

of temperature rise, the impacts on productivity and prices are even greater. Moreover, increasing frequencies of heat stress, drought and flooding events, not factored into the projections mentioned above, will result in further deleterious effects on productivity. It is likely that price and yield volatility will continue to rise as extreme weather continues. Climate change will also impact agriculture through effects on pests and disease. These interactions are complex and the full implications in terms of productivity are still uncertain). Climate-smart agriculture (CSA) includes proven practical techniques – such as mulching, intercropping, conservation agriculture, crop rotation, integrated crop-livestock management, agro-forestry, improved grazing, and improved water management – but also innovative practices such as better weather forecasting, early warning systems and risk insurance. It is about getting existing technologies off the shelf and into the hands of farmers and developing new technologies such as drought or flood tolerant crops to meet the demands of the changing climate. It is also about creating and enabling policy environment for adaptation.[8]

CSA endures to ensure that despite change in climate and its adverse impact on crops/animals, income to farmers should not decrease. It provides opportunities to have multiple sources of income from agriculture and animal husbandry - milch cattle and poultry, fisheries, when one fails, other supports.

It provides opportunity to young members of family to acquire multiple skills, support for setting up microenterprise locally, based on demand and supply situation. It provides safety net at the time of natural calamities – by way of insurance – for crops & animal husbandry along with employment in community projects. Climate smart agriculture involves:

- Crop pattern based on soil health & moisture analysis to support crops which can be sustained.
- Agro – advisory
  a) On predicted weather pattern long term, medium term and weekto week basis given by Meteorology Department – this prior to kharif and rabi season
  b) After unexpected weather that changes have occurred for corrective action to prevent crop loss and livestock management.
- Crop production that contributes to food security by addressing current and projected climate change impacts through adaptation and mitigation and provides an opportunity to win-win situation despite adverse changes.

[8] *Id*. at 29.30,31

- It provides institutional arrangement for mass communication and a way to bridge productivity gaps at local level between farmers by reaching out farmers at their door step.[9]

2.3. Food Security

Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security means ensuring a sustainable supply of food at affordable prices that meets existing dietary preferences. Food security has three components, *viz*., availability, access and absorption (nutrition). These three are interconnected. Performance in availability of food related to food production, per capita availability of food grains and other edibles and policies for improving availability. There is an urgent need of food security to provide food to each and every person and to improve nutritional status because a complex issue with both global and local dimensions that are intimately linked together. There is no quick fix to the food security crisis that continues to afflict the world's poorest nations. However, action can be taken through government policies to lay the necessary foundations for a lasting solution to enhance the sustainability of food production and agriculture while simultaneously improving the quality and safety of the food available for consumption.[10]

Food security is a condition related to the supply of food, and individuals' access to it. Concerns over food security have existed throughout antiquity. The necessity to challenge climate change while producing more food to feed the world's growing population means that "climate-smart agriculture" (CSA) is one of the advocated ways forward. This method principally defends an agriculture that sustainably increases productivity, resilience. This will concurrently help meet the goals of food security and overall development.

Climate change is expected to have generally negative effects on developing-country agriculture, with concomitant implications for food security. Projections indicate that the impacts will increase over time, with socioeconomic development and trade much more important drivers of food security in the short run, but with climate change playing an increasingly important role after 2030. In the intervening years, however, climate shocks

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[9] Dr. Kirit N Shelat, *Climate Smart Agriculture – The Way Forward the Indian Perspective, 6,7 (2014) National Council for Climate Change*, Sustainable Development and Public Leadership (NCCSD), Ahmedabad and Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad

[10] Tanu Jain, Shikha Bathla, Role of Agriculture in Enhancing Food Security, *International Journal of Science and Nature*, 34 (2016)

such as drought, flooding, and extreme temperatures are expected to increase in frequency and intensity, and that is already occurring. In the absence of measures to reduce the vulnerability to, and impacts of, such extreme events, they can be expected to generate significant and negative impacts on food security.[11]

3. Climate Smart Agriculture- International Developments

One of FAO's 14 themes in support of sustainable development is climate change. CSA was developed by FAO as a unified approach to address climate change challenges. The concept of Climate-smart agriculture was first launched by FAO in 2010 in a background paper prepared for the Hague Conference on Agriculture, Food Security and Climate Change (FAO, "Climate-Smart" Agriculture Policies, Practices and Financing for Food Security, Adaptation and Mitigation. 2010), in the context of national food security and development goals, to tackle three main objectives:

- Sustainably increase food security by increasing agricultural productivity and incomes
- Build resilience and adapt to climate change
- Reduce and/or remove greenhouse gas emissions where possible.[12]

Ongoing FAO projects support work on CSA, for example, FAO's Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) programme and the Mitigation of Climate Change in Agriculture (MICCA) programme. The technical research and field work of FAO's MICCA programme have provided evidence that climate-smart agricultural practices can reduce GHGs, improve livelihoods and make local communities better able to adapt to climate change. The evidence supports international climate negotiation processes undertaken through the UN Framework Convention on Climate Change (UNFCCC).[13]

Also linked to CSA is FAO's Ecosystem Approach to Fisheries. It is becoming the main reference framework for managing fisheries and implementing the principles of sustainable development. The main aim is to ensure that despite natural changes in the ecosystem, the capacity of the aquatic ecosystems to produce fish food, revenues and livelihoods is maintained indefinitely for the benefit of the present and future generations.[14]

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[11] Philip Thornton, Leslie Lipper, *How Does Climate Change Alter Agricultural Strategies to Support Food Security?* 1, IFPRI Discussion Paper, April 2014, CGIAR Research Program on Policies, Institutions and Markets

[12] Climate-Smart Agriculture. Read full article at *http://www.fao.org/climate-smart-agriculture/overview/faqs/history/en/,* last visited on 03.12.2019.

[13] *Id.*

[14] *Id.*

Livestock can make a large contribution to climate-misery food supply systems. FAO facilitates and is actively involved in two multi-stakeholder partnerships, the Global Agenda for Sustainable Livestock and the Livestock Environmental and Assessment Partnership (LEAP).[15]

4. The Indian Scenario – The Food Security Act, 2013 and the Climate Smart Agriculture

This definition of food security has evolved over a period of time. As a concept, food security originated in the mid-1970s, in the wake of global food crisis. The initial focus of attention was assuring the availability and to some degree the price stability of basic foodstuffs at the international and national level. This was then broadened to incorporate the demand side of food security in early eighties. During the nineties issues such food safety, nutrition, dietary needs and food preferences were also considered important ingredients of food security. In FAO report on 'The State of Food Insecurity, 2001', food security is defined as a " --- situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".[16] In the Indian context, the underpinnings for food security of the people can be found in the Constitution, though there is no explicit provision on right to food. The fundamental right to life enshrined in Article 21 of the Constitution has been interpreted by the Supreme Court and National Human Rights Commission to include right to live with human dignity, which includes the right to food and other basic necessities. Under Directive Principles of State Policy, it is provided under Article 47 that that the State shall regard raising the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties.[17]

Providing food security has been focus of the Government's planning and policy. Food security means availability of sufficient food grains to meet the domestic demand as well as access, at the individual level, to adequate quantities of food at affordable prices. Attainment of self-sufficiency in food grains production at the national level has been one of the major achievements of the country. In order to address the issue of food security at the household level, Government is implementing the Targeted Public Distribution System under which subsidised food grains is provided to eligible households.[18]

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[15] *Id.*
[16] Food Security in India - issues and challenges. Read full article at *http://dfpd.gov.in/writereaddata/images/NFSA-article-edited.pdf*, last visited on 03.12.2019.
[17] *Id.*
[18] *Id.*

To further strengthen the efforts to address the food security of the people, the Government has enacted the *National Food Security Act, 2013*. It marks a paradigm shift in approach to food security – from welfare to rights based approach. The Act legally entitles upto 75% of the rural population and 50% of the urban population to receive subsidised foodgrains under Targeted Public Distribution System. About two thirds of the population therefore will be covered under the Act to receive highly subsidised foodgrains. There is a special focus in the Act on nutritional support to pregnant women and lactating mothers and children upto 14 years of age by entitling them to nutritious meals. Pregnant women will also be entitled to receive cash maternity benefit of Rs. 6,000 in order to partly compensate her for the wage loss during the period of pregnancy and also to supplement nutrition. Keeping in view the important role that women play in ensuring food security of the family, the Act contains an important provision for women empowerment by giving status of head of the household to the eldest woman of the household, for the purpose of issuing of ration cards.[19]

3.1. **Salient features of the Act**

(i) *Coverage and entitlement under Targeted Public Distribution System (TPDS):* Upto 75% of the rural population and 50% of the urban population will be covered under TPDS, with uniform entitlement of 5 kg per person per month. However, since *Antyodaya Anna Yojana* (AAY) households constitute poorest of the poor, and are presently entitled to 35 kg per household per month, entitlement of existing AAY households will be protected at 35 kg per household per month.

(ii) *State-wise coverage*: Corresponding to the all India coverage of 75% and 50% in the rural and urban areas respectively, State-wise coverage will be determined by the Central Government. State-wise coverage has been determined by the Planning Commission on the basis of 2011-12 NSSO Household Consumption Expenditure Survey data.

(iii) *Subsidised prices under TPDS and their revision:* Foodgrains under TPDS will be made available at subsidised prices of Rs. 3/2/1 per kg for rice, wheat and coarse grains for a period of three years from the date of commencement of the Act. Thereafter prices will be suitably linked to Minimum Support Price (MSP).

(iv) In case, any *State's allocation* under the proposed legislation is lower than their current allocation, it *will be protected* upto the level of average offtake during last three years under normal TPDS, at prices to be determined by the Central Government.

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[19] *Id.*

Existing prices for APL households i.e. Rs. 6.10 per kg for wheat and Rs 8.30 per kg for rice has been determined as issue prices for the additional allocation to protect the average offtake.

(v) *Identification of Households*: Within the coverage under TPDS determined for each State, the work of identification of eligible households is to be done by States/UTs.

(vi) *Nutritional Support to women and children:* Pregnant women and lactating mothers and children in the age group of 6 months to 14 years will be entitled to meals as per prescribed nutritional norms under Integrated Child Development Services (ICDS) and Mid-Day Meal (MDM) schemes. Higher nutritional norms have been prescribed for malnourished children up to 6 years of age.

(vii) *Maternity Benefit:* Pregnant women and lactating mothers will also be entitled receive maternity benefit of not less than Rs. 6,000 as per scheme to be formulated by the Central Government.

(viii) *Women Empowerment***:** Eldest woman of the household of age 18 years or above will be the head of the household for the purpose of issuing of ration cards.

(ix) *Grievance Redressal Mechanism***:** Grievance redressal mechanism at the District and State levels. States will have the flexibility to use the existing machinery or set up separate mechanism.

(x) *Cost of intra-State transportation & handling of food grains and FPS Dealers' margin:* Central Government will provide assistance to States in meeting the expenditure incurred by them on transportation of food grains within the State, its handling and FPS dealers' margin as per norms to be devised for this purpose.

(xi) *Transparency and Accountability:* Provisions have been made for disclosure of records relating to PDS, social audits and setting up of Vigilance Committees in order to ensure transparency and accountability.

(xii) *Food Security Allowance:* Provision for food security allowance to entitled beneficiaries in case of non-supply of entitled food grains or meals.

(xiii) *Penalty:* Provision for penalty on public servant or authority, to be imposed by the State Food Commission, in case of failure to comply with the relief recommended by the District Grievance Redressal Officer. [20]

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[20] *Id.*

In 2014, India began the implementation of its National Food Security Act. The law aims to provide, as seen above, subsidised food grains to more than 800 million people in the country. While this law will have obvious implications to the food security of the Indian population, the law goes further in also promoting climate resilience. It embraces a diverse range of foodgrains, including millets, sorghum and maize, a group of coarse grains in its text.[21]

This is a first, as prior to this law, food distribution systems only sourced "fine grains" i.e. rice and wheat. Coarse grains are highly resistant to climate-induced stresses. Their inclusion in the law is likely to promote cultivation, especially in the more marginal areas of India, where these crops are very important for local food security and cultural identity. It is estimated that over 31 million Indian farmers grow these crops, stimulating their production therefore contributes to climate adaptation and food security.[22]

5. The Grey Areas

Huge growth in population and continuously changing diet are the two major factors behind changing food needs of world. Production is regularly suffering due to reduced yields from farm lands. Marine resources, bio-diversity, water and soil health are all suffering in chase of higher yields. The challenge is intensified by agriculture's extreme vulnerability to climate change. Hotter and shorter growing seasons, reduced rainfall and more frequent extreme weather events are affecting crops and livestock.

Climate Smart Agriculture (CSA) is an integrated approach to managing landscapes- cropland, livestock, forests and fisheries, that address the interlinked challenges of food security and climate change. Let us see what all CSA seeks to achieve and how far the Food Security Act has been able to fulfil these objectives:

1. Increased Productivity: Produce more food to improve food and nutrition security and boost the incomes of 65 per cent of poor working adults employed in agriculture. The Food Security Act nowhere mentions ways to increase productivity.
2. Enhanced Resilience: Reduce vulnerability to drought, pests, disease and other shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns. The Food Security Act is silent with respect to enhanced resilience.

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[21] India promotes climate resilience through its Food Security Bill. Read full article at *https://cgspace.cgiar.org>handle* last visited on 03.12.2019

[22] *Id.*

3. Reduced emissions: Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to suck carbon out of the atmosphere. The Act is silent in this regard too.

Thus, what can be seen is that the Food Security Act, 2013 stresses on targeted public distribution system and analogous matters. It does not directly refer to climate smart agriculture or climate change and its impact on food security. The growing of climate friendly food grains is only a part of meeting the targets of the Act but not directly relatable to climate smart agriculture.

6. Suggestions and Conclusion

From the above lines it is amply clear that the Food Security Act, 2013 does not amply satisfy the requirements of climate smart agriculture. Its prime focus is targeted public distribution system and it assures food for all but does not remedy the need to address the issue of climate change and its analogous climate smart agriculture. Therefore, the need is to amend the Act in such a manner that the Act itself imbibes the principle of climate change and food security. If not the Act the Rules should be framed regarding the kind of food grains to be grown which assure food security and also address the issue of climate smart agriculture. Unless done in a legislative framework climate change, food security and climate smart agriculture cannot be achieved and the purpose of Right to Food Act, 2013 shall be defeated.

The present National Food Security Act proposed by the government is a narrow one. Right to Food in terms of providing food and nutritional security to all is a much broader concept than the proposed National Food Security Act of providing 25 kilograms of food grains at Rs.3. Many things have to be included in order to have genuine 'Right to Food. Food refers to availability, accessibility, adequacy, and sustainability. Food security is most emerging issue now days. During the Green Revolution era, large investments were made on research and development for the irrigated agriculture. The promotion of HYV seed - fertilizer - irrigation technology had a high pay-off and rapid strides of progress were made in food production. But, since couple of years agriculture productivity is adversely affected by several causes mainly climate change in India. Agriculture Productivity is a base factor for assuring food security. Government should make a strong action plan for proper implementation of food security act and government should also make a policy for increasing agricultural productivity.[23]

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[23] Supra n. 1 at 328

where possible, and enhances achievement of national food security and development gs identified as food security and development (FAO 2013a Lipper et al. 2014 while productivity, adaptation, and mitigation are identified as the three interlinked pillars necessary for achieving this goal.