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Climate Change and food Production Inequality in India

[1]Dr.S.Theenathayalan and [2]S.Murugan

[1]Associate Professor of Economics, Department and center for research in Economics, The Madura College (Autonomous) Madurai, Tamilnadu

[2]Assistant Professor of Economics, Department and center for research in Economics, The Madura College (Autonomous) Madurai, Tamilnadu.

Abstract

This paper examines the current food crises, the projected effect of climate change, the vulnerabilities created by regional concentrations of food production, imports and exports, and the significant role of women as food producers, consumers and family food managers. Bridging productivity differentials between male and female farmers, by helping women overcome production constraints, would significantly increase agricultural output. This becomes an imperative, given the feminization of agriculture. Institutionally, a group approach to farming would help women and other smallholders enhance their access to land and inputs, benefit from economies of scale, and increase their bargaining power economically and socially. The proposed study deals with the Climate factors, challenges of global warming, GHG Emissions in India, effect of Global warming in our Agriculture, Agriculture and Food production, Change in rainfall amount and patterns, efforts to mitigate climate change in the agriculture sector, conclusion respectively.

Keywords: food crises, food security, gender inequality, women farmers, agricultural productivity, gendered constraints, and group farming.

Introduction

Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcing or to persistent anthropogenic changes in the consumption of the atmosphere or inland use.

Climate Factors

Several factors directly connect climate change and agricultural productivity:

- Average temperature increase
- Change in rainfall amount and patterns
- Rising atmospheric concentrations of CO_2
- Pollution levels such as troposphere zone
- Change in climate variability and extreme events

Challenges of global warming

Global warming is the rise in the average temperature to a level which affects the life forms on the earth's surface. It is caused and contributed by the release of green house gases (CHG) in the atmosphere to the extent of about 49 per cent by carbon oxide (CO2) 18 percent by methane (CH3) 14 percent by Chlorofluorocarbons 6 percent by nitrous oxide (N2O) and 13 percent by others viz., Ozone (O3) carbon mono oxide (CO1) etc., These gases are emitted into the atmosphere from industrial factories (16.8 percent) emissions from transportation vehicles (14.01 percent) from fertilizers and cement producing factories nearly 12.5 percent decay in the paddy fields. In the GHGs chlorofluorocarbons and methane trap and retain heat in far more quantity as compared to that of carbon dioxide.

GHG Emissions in India

During the year 2002 our country was observed to be the sixth largest per capita emitter of CO2 in the world the other 5 large emitters being U.S.A, Russia, Japan, European Union (EU) nations and China. But quantitatively, our country emitted 20 times less CO2 than that of USA. It has been recorded that India emitted 908 m.t of CO2 in 1998 (which as that time was 4 percent of the world's total). The per capita emissions of CO2 were 0.93mt. Per annum. It was well below the world average of 3.8mt per annum. But as compared to 2 percent world average the present rate of growth of GHG emissions in India annually is at 4.6 per cent.

Effect of Global warming on our Agriculture

Among the food grain crops, wheat plants are very sensitive to even small increases in the atmospheric temperature as compared to rice plants which have relatively for greater adaptability

and tolerance to heat than wheat. Even 1˚c rise in the earth's surface temperature, could cost wheat production drop by 4 to 5mt and it has been estimated that due to rising temperature, our country may lose even up to 125mt of cereals production (F.A.O).

In the long run the climate change could affect agriculture in the following ways:-

1. Productivity in terms of quantity and quality of crops
2. Agriculture practices through changes of water use (irrigation) and agricultural inputs such as herbicides, insecticides and fertilizers.
3. Environmental effects in particular in relations of frequency and intensity of soil drainage leading to nitrogen leaching, soil erosion reduction of crop diversity
4. Rural space through the loss and gain of cultivated lands, land speculation and renunciation and hydraulic amenities
5. Adaptation, organisms may become more or less competitive as well as humans may develop urgency to develop more competitive organisms such as flood resistant or salt resistant varieties of rice.

Table 1 Share in Agriculture sector in GDP of some selected Asian Countries (in percent)

Country	Agriculture Sector			
	1980	**1990**	**2001**	**2005**
China	30.1	27.0	15.2	12
India*	38.1	31.0	24.7	23
Indonesia	24.8	19.4	16.4	13
Korea	14.9	8.5	4.4	4
Malaysia	NA	15.4	8.4	8
Pakistan	29.6	26.0	25.0	20
Philippines	25.1	21.9	15.1	13
Thailand	23.2	12.5	8.6	7

Source: Asian Development Bank (ADB) Key indicators, 2005

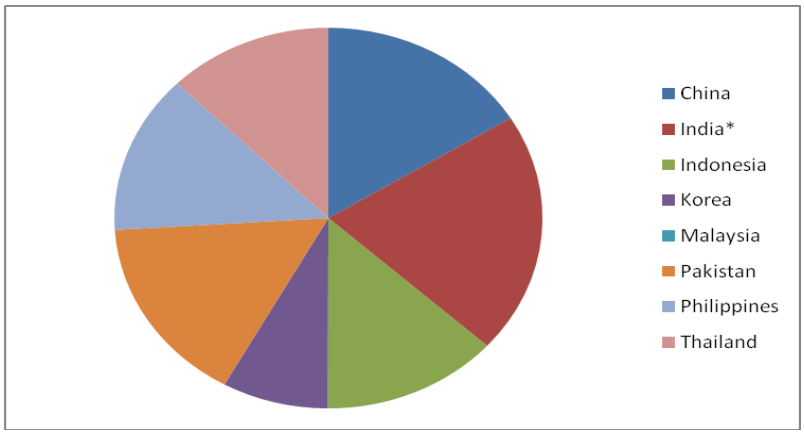
Note: 1* For India and Pakistan data are based on GDP at current

Factor cost.

2. NA – Not Available

The above table highlights how the share of agriculture sector in GDP declined by 13.4 percentage points between 1980, when it was 38.1 per cent and 2001 during which it reordered a more 24.7 per cent, followed by China, Thailand, Korea, Philippines, Indonesia, Malaysia and

Pakistan with the percentage is points of 12,7,4,13,13,8,20 strikingly similar to the corresponding decline in agriculture share in GDP of many other Asian countries between 1980 and 2001.



The above figure shows the graphic representation of share in Agriculture sector in GDP some selected Asian countries.

Agriculture and Food production

The failure of the 2009 monsoon will lead to a 16 per cent fall in Kharif food grain output this year production is expected to fall to around 98 million tones compared to 117.7 million tones produced in Kharif 2008.

Rice production will fall from 84.6 million tones in Kharif 2008 to 68 million tones coarse grains are also expected to see a fall in production. Total food grain production is projected to fall by 8.5 percent to 216 million tones in 2009-10. Non good grains production is projected to fall by 3.2 per cent. As a result total crop production is projected to fall by 6.2 per cent.

Efforts to mitigate climate change

Some efforts to mitigate climate change in the agricultural sector have also been undertaken. They are

- Standardization of fuel-efficient pump sets, rectification of existing pump sets
- Rationalization of power tariffs
- Better cultivator practices which will help in reducing N2O emissions

- Improve the management of rice paddies production through judicious use of organic manure, fertilizers, irrigation water, nitrification inhibitors, fertilizers placement and their scheduling
- Improve management of livestock population especially reminants and its diet
- Increase soil organic carbon through minimal tillage and residue management
- Improve energy use efficiency in agriculture through better designs of machinery and by resource conservation practices
- Change land use pattern by increasing area user bio fuels, agro forestry but not at the costs of food production.

The Government of India is implementing a range of policies aimed at mitigation of and adaptations of climate change are as:

- National Action plan on climate change (NAPCC) 30th June 2008
- National Solar Mission
- National Mission for enhanced Energy Efficiency
- National mission on sustainable Habitat
- National water mission
- National mission for sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for sustainable Agriculture
- National Mission for strategic knowledge for climate

These missions address sustainable development and co-benefits to society at large, with a focus on adaptation and mitigation and promotes scientific research to address climate change.

Energy Security

Promoting Renewable Energy sources like hydro electricity, wind, solar, biomass and nuclear power.

Transportation

Development of efficient public transportation systems can reduce the dependence personnel vehicles thus moderating the increase in emissions

Forests

Conserving forests and increasing forest cover therefore contributes to mitigation. At the same time forests help to prevent soil erosion and downstream flood.

Conclusion

India's capacity to cope with (or adapt to) climate is severely limited by the fact that is a low-income country, facing serious resource constraints. These deficiencies in adaptive capacity can be overcome only through rapid development. Without accelerated economic and social development, futures generations in India would remain extremely vulnerable to the impacts of climate change. At the same time India should continue to contribute to the global mitigation efforts by implementing "win win" measures.

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