ROLE OF INCOME SUSTAINABLE IN AGRICULTURE AND FOOD SECURITY IN INDIA

Dharampal Singh

Asst. Professor Commerce

Guru Nanak Khalsa College Yamunanagar (HR)

ABSTRACT

The fast development of technology for increasing production without giving due importance to the agro ecosystem balance resulted in disturbed biological relationships. The imbalances thus created lead to fast degradation of natural resource base. Thus the present productivity levels have become unstable and uneconomic. This necessitated maintenance of natural resources so as to meet future demand. Thus the concept of Sustainable Agriculture emerged. Sustainable Agriculture aims at production of safe and clean food without harming the quality of natural landscapes and with minimal impact on environment. However it should operate within socially acceptable system and economic viability. Extreme weather events and climatic anomalies have major impacts on crops productivity and food security. Year to year weather variability is regarded as the primary cause of year to year fluctuations in yields. Increased usage of fertilizers has played a significant role in accelerating the agricultural growth and productivity apart from application of modern farming techniques and better quality inputs. In this paper we have analyzed the annual growth rate trends in total food grains production and productivity in India. We have also tried to find out the impacts of climatic changes and chemical fertilizers and pesticides on total food grains production and productivity in India. The uses of chemical fertilizers and pesticides have started adversely affecting the sustainable agricultural development. So we should promote Organic Farming and use of Bio-fertilizers and pesticides in place of chemical fertilizers and pesticides which is eco-friendly and helpful in sustainable agricultural development.

1. Introduction: The term sustainable development came into prominence in the world conservation strategy, presented in 1980 by the International Union for the conservation of

Nature and Natural Resources. It was defined in the Brundtland Report "our common future" 1987 as "Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability of future generations to meet their own needs".

1.2. Objectives of Sustainable Agriculture: The main objectives of the proposed study are to visualize benefits of Sustainable Agriculture and to promote and to conserve environment for the future generations. The fast development of technology for increasing production without giving due importance to the agro ecosystem balance resulted in disturbed biological relationships. The imbalances thus created lead to fast degradation of natural resource base. Thus the present productivity levels have become unstable and uneconomic. This necessitated maintenance of natural resources so as to meet future demand. Thus the concept of Sustainable Agriculture emerged. Sustainable Agriculture aims at production of safe and clean food without harming the quality of natural landscapes and with minimal impact on environment. However it should operate within socially acceptable system and economic viability.

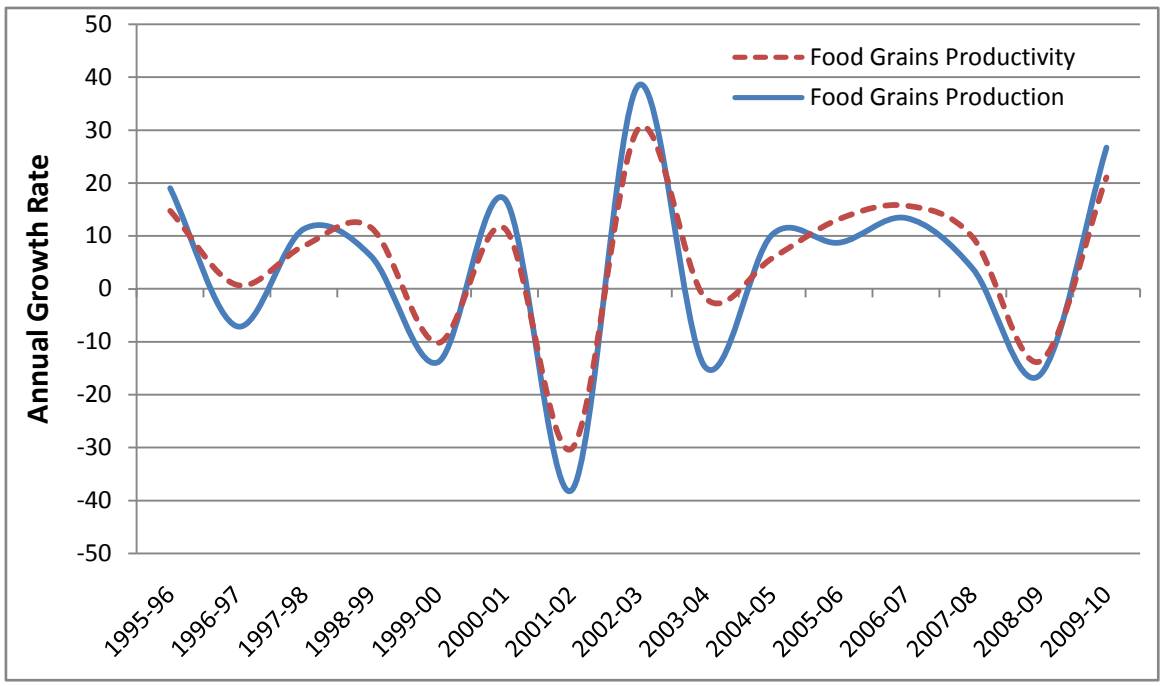
2. Methodology: The study is based on secondary data obtained from the publications of Reserve Bank of India (RBI), Indian Meteorological Department (IMD) Government of India publications, etc. The data on production, productivity and other related variables of important food grains were collected from different published sources such as; Economic Survey of India; Agricultural Statistics and National Sample Survey (NSS)) Organization, Department of chemical fertilizers and pesticides; New Delhi and IPM.

3. Food Self-Sufficiency and Food Security in India: World Development Report 1986, defined Food Security as "access by all people at all times to enough food for an active and healthy life." Food and Agricultural Organisation (FAO 1983), defined Food Security as "ensuring that all people at all times have both physical and economic access to basic food they need."

3.1 Food Grains Production and Productivity: Production fluctuates every year according to the monsoon. Production depends upon yield rate of the crops. Productivity depends on three factors inputs: Water, Fertilizers and Hybrid seeds. Each of these plays a role in determining yield level and in turn augmentation in the level of production.

Figure No. 1

Changes in Annual Growth Rates of Food Grains Production and Productivity in India:



Source: Indian Economy Survey, New Delhi

Figure No.1 indicates that in India, food grains production is increasing continuously. For five consecutive years, from 2004-05 to 2008-09, food grains production recorded an increasing trend. After 2009 food grains production is going down. After reaching a record level it declined to 196.81m.tons in the year 2000-01. For five consecutive years, from 2004-05 to 2008-09, food grains production recorded an increasing trend.

3.2 Climate Change and its Impacts on Sustainable Agricultural Development: Climate change is the defining issue of our times. It is perhaps the greatest challenge to sustainable development. Extreme weather events and climatic anomalies have major impacts on crops productivity and food security. Year to year weather variability is regarded as the primary cause of year to year fluctuations in yields.

During the past decades, after all the calculations and study of temperature, rainfall and food grains production we can say that climate change is not affecting the food grains production by and large. In the year 1981 to 2000 the temperature has been more or less stable. During

this period there are normal increments observed in rainfall but there is continuous increment in food grains production.

During year 2000 to 2010 there have been continuous increments in temperature every year. During this period there is normal increment observed in rainfall but increment in food grains production is not increment like year 1980 to 2000. With respect to earlier observation there has been increment in temperature by 4 to 6 degree during year 2002 to 2005. In this period decrement has been observed in rainfall. Owing to this rise in temperature there has been fall in growth of food grains production observed during this period. During this period food grains production has been more affected by climate change.

We have observed that temperature has affected the food grains production along with rice production in Madhya Pradesh and Bihar. It has also affected the pulses production in Uttar Pradesh, Bihar, Punjab and Haryana. In regard to food grains productivity, temperature and rainfall affected the food grains productivity in Maharashtra. It also affected the wheat productivity in Punjab. In Bihar temperature and rainfall affected the food grains productivity along with rice, wheat and pulses productivity. Rainfall affected the food grains productivity along with pulses productivity in Haryana. Thus temperature and rainfall affected the food grains productivity in Bihar. The effects of climatic changes on total food grains production is seen in Madhya Pradesh and Bihar whereas this effect is seen more on total food grains productivity in Bihar and Rajasthan. Bihar seems to have been quite affected both in terms of total food grains production and productivity.

3.3 The Role of Chemical Fertilizers and Pesticides in Sustainable Agricultural Development: Use of chemical pesticides affected the total food grains production and productivity in India and most affected states are Andhra Pradesh, Madhya Pradesh and Haryana. Maharashtra and Punjab are also affected by use of chemical pesticides in total food grains production and productivity. It means pesticides are most adverse affecting factor for ecological balance and sustainable agricultural development. The use of chemical fertilizers is affecting less on total food grains production and productivity in India. The use of chemical pesticides is affecting more on total food grains production and productivity in India. The analysis shows, that the use of chemical pesticides is comparatively most affecting factors than use of chemical fertilizers for total food grains productivity. There is much variation in growth rate trends of use of chemical fertilizers and pesticides, total food grains production and productivity in India along with Bihar and Rajasthan since 1982 to 2010.

Bihar is the only state which is most affected by use of chemical fertilizers in total food grains production and productivity. The total food grains production and productivity in India shows positive growth rate trends along with Maharashtra and Rajasthan. The use of chemical fertilizers affects total food grains production and productivity in India to a lesser extent.

4. Conclusion: The analysis shows, that the use of chemical pesticides is comparatively most affecting factors than use of chemical fertilizers for total food grains productivity. There is much variation in growth rate trends of use of chemical fertilizers and pesticides, total food grains production and productivity in India. Bihar is the only state which is most affected by use of chemical fertilizers for total food grains production and productivity. The use of chemical fertilizers affects total food grains production and productivity in India to a lesser extent.

Excessive use of chemical pesticides affects total food grains production and productivity in India along with Bihar and Punjab comparatively to a larger extent. Excessive use of chemical pesticides affected the total food grains production and productivity in India and most affected states are Maharashtra and Punjab. Punjab has most affected state by the use of chemical pesticides. It means pesticides are most adverse affecting factor for ecological balance and sustainable agriculture development.

Sustainable agriculture improves food security by improving the quality and nutritional value of the food, and by producing a bigger range of produce throughout the year. The Indian government's policies have always emphasized food grain self-sufficiency, which has not necessarily coincided with agricultural sustainability. Profitability and sustainability of the farming system will go a long way to ensure the all-round sustainability.

5. Suggestion: Sustainability issues of the agriculture are of global concern, but they are more vital for India, where large number of labour force is involved in and also dependent on it. Considering the present situation of agriculture and its problems and resulting environmental degradation, sustainability of Indian agriculture is the only scientific solution on the agricultural problems due to excessive use of chemical fertilizer and pesticides. Use of chemical pesticides has started adversely affecting the sustainable agricultural development. Our analysis suggests that Bio-fertilizers and pesticides are not replacement of chemical fertilizers and pesticides but can supplement their requirement. It should be used as

complement to normal fertilizers. We should promote use of Bio-fertilizers and pesticides which is eco friendly and helpful in sustainable agricultural development.

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