

Determinants of Food Grains Production in India

Dr. Juhi Shamim

PHD in Economics,
Aligarh Muslim University, Aligarh, Uttar Pradesh

Abstract- Present paper discusses the determinants of food grains production in India. The Indian economy has changed fundamentally over time with the foreseen decrease in agriculture's share in gross domestic product (GDP). There is high burden on agriculture to produce more and to raise the income of farmers. India's manufacturing sector saw unpredictable growth and its share in GDP has nearly stayed steady at 15 percent over the most recent three decades. Under these conditions, it is valuable to investigate the determinants of agriculture growth. There are countless determinants that influence food grains production. Some of them are discussed in this paper.

Index Terms- Food grains, Crop Production, Physical Factors, Technological Factors, Infrastructural Factors, Institutional Factors and Socio-economic Factors.

I. INTRODUCTION

An electrical source supplies energy to a transmitter, which in The Indian economy has changed fundamentally over time with the foreseen decrease in agriculture's share in the gross domestic product (GDP). This share decreased from 55.1 percent in 1950-51 to 17.2 percent in 2016-17. But, regardless of this fall of agriculture's share in India's GDP, agriculture stays significant for two noteworthy reasons. First India has accomplished independence in food production at a large scale however a food-deficit nation is as yet. There is a high pervasiveness of malnourished children and a high frequency of country destitution. Likewise, there is high burden on agriculture to produce more and to raise the income of farmers. The subsequent explanation is that the reliance of the country workforce on agriculture for employment is all the more moderately to its share to GDP which brought about enlarging income divergence among agriculture and non-agriculture areas. The experiences of developed nations demonstrate that the exchange of work power from agriculture to the manufacturing division has advanced production growth in agriculture and along these lines' higher income. Notwithstanding, India's manufacturing sector saw unpredictable growth and its share in GDP has nearly stayed steady at 15 percent over the most recent three decades. Under these conditions, it is valuable to investigate the determinants of agriculture growth. The productivity growth in agriculture is both an important and adequate condition for the advancement of the division as well as the economy.

There are countless determinants that influence food grains production. Some of these incorporate physical factors, technological factors, infrastructural factors, institutional

factors and socio-economic factors. These and examined underneath.

1. Physical Determinants

The physical factors are the climatic factors which affects the food grains production of any region. It includes rainfall, temperature, wind, soil, precipitation, humidity, solar radiation and atmospheric gases.

Rainfall

Water is clearly a key factor underway of yields. The more noteworthy the average temperature the more prominent the measure of water required for crop production. Seasonal variation is significant as different crops require different amounts of water and at different times. Subsequently, rainfall is one of the most significant elements which impact the production of any locale. In overwhelming and equally distributed rainfall zones, crops like rice in plains and tea, coffee and rubber in the Western Ghats are grown. Low and uneven distribution of rainfall is normal in dry land cultivating where dry season obstruction crops like pearl millet, sorghum, and minor millets are grown. Conveyance of rainfall is a higher priority than total rainfall to have a longer growing period, particularly in dry terrains.

Temperature

Temperature is a proportion of intensity of heat vitality. The range of temperature for maximum growth of the vast majority of the agriculture crops is somewhere in the range of 15°C and 40°C. A large number of crops cannot be grown if the temperature falls underneath 6°C or the soil is solidified for five consecutive months. As a result, numerous regions are inadmissible for crop cultivation. The temperature of a region is generally controlled by its distance from the equator and

altitude. In this manner altitude likewise influences farming. At the point when temperatures are reliably high with adequate precipitation high yield crop, for example, rice can be grown. Temperature impacts the distribution of crops and vegetation, germination, development and advancement of crops.

Humidity

Humidity is nothing but the water present in the atmosphere as water vapor. The impacts of humidity on crop production are estimated in term of relative humidity. The relative humidity is the "proportion between the measures of moisture present in the air to the immersion limit of the air at a specific temperature". In the event that relative humidity is 100 percent, it implies that the whole space is loaded up with water and there is no soil dissipation and plant transpiration. The reasonable range of relative humidity for the greater part of the crops is 40 – 60 percent. Not many crops can perform well when it is 80 percent or more. High relative humidity prompts an opportunity for the episode of pest and disease. Relative humidity impacts the water necessities of crops.

Precipitation

Precipitation incorporates all water which falls from atmosphere, for example, rainfall, snow, mist, and dew. Total precipitation amount and its circulation incredibly influence the decision of harvesting crops of any area. Yields are not in every case legitimately corresponding to the measure of precipitation, as excess above ideal diminishes the yields.

Soil

The production of crops is impacted by the kind of soil on the grounds that various crops incline toward various soils. Soil type can be affected by the contribution of time, clay or manures yet these make constrained contrasts as it were. Clay soils with their high-water maintenance are appropriate to rice whist sandy soils with good drainage are useful for root vegetables. Soil water helps in chemical and biological activities of soil including mineralization. Soil air is fundamental for the absorption of water by roots. Soil temperature impacts the pace of retention of water and supplements. It influences the germination of seeds and the growth rate of underground bits of the crops.

Wind

The fundamental function of wind is to carry moisture and heat. Other than this it likewise supplies fresh CO₂ for photosynthesis. A large portion of the crops grow best when it moves at a speed of 4 to 6 km/hour. It can harm the crops like banana and sugarcane when moving at a tremendous speed. It causes soil erosion and increases evaporation. Wind dispersal of pollen and seeds is common and important for specific crops.

Solar Radiations

Solar radiation is one of the main considerations which influences crop production. It controls conveyance of

temperature and thereby the appropriation of crops in an area. From germination to reap and even post-harvest crops are influenced by solar radiation. All the physical procedures occurring in the soil, plant, and environment relies upon solar radiation.

Atmospheric gases

Atmospheric gases like Carbon dioxide (CO₂), Oxygen (O₂), Nitrogen (N₂), Argon and so forth have huge effect on production of crops. CO₂ is significant for photosynthesis and is come back to atmosphere during the deterioration of natural materials, all farm wastes and through respiration. O₂ is significant for respiration of plants and is released by plants during photosynthesis. N₂ is one of the significant major plant supplements, atmospheric N is fixed in the soil by lightening, precipitation and N fixing organisms in pulses crops and accessible to plants. Certain gases like SO₂, CO, CH₄, HF released to atmosphere are harmful to plants.

2 Technological Determinants

Apart from soil and climatic conditions, the food grains production of any region would also depend on technological factors. Technological factors include High Yielding Variety (HYV) seeds, fertilizers and pesticides.

HYV Seed

In the Indian states of food grains productions, it has been seen that around 45 percent expansion in the crop production is related to the expansion in yield which is thus is a direct function of the use of HYV seeds. Along these lines, special focus has been made on the improvement and reception of high – yielding varieties of seeds.

Fertilizers

Fertilizers are basics for yields in the underlying phase of their growth then they assume a significant role in crop production. Fertilizers are only the materials of synthetic or natural inception which gives basic supplements to the crops. Manures are applied to the plant tissues or soil. It is important to bring new arrives under cultivation and furthermore acts as a yield–expanding segment.

Pesticides

Pesticides play a significant role in supporting agricultural production of the nation by shielding crops from pests' assaults and by monitoring the pest populace. Pesticides are only the blend of substances which aides in anticipating wrecking or controlling the nuisances of undesirable species on plants.

In India, crop losses because of different pests range from 10 to 30 percent consistently. In this way, it is important to utilize protected and adequate pesticides by the farming network for a supported increment in agricultural production and productivity.

3. Infrastructural Determinants

Infrastructural facilities include various types of farm implements and machinery and other structures like tractors, pump sets, cold storage facilities and adequate supply of power, good rural-urban road network, efficient transportation, developed agricultural marketing and other technological advancements. The availability of these inputs and their skilful utilization has a positive impact on the growth of agriculture sector. Infrastructural determinants include irrigated area, farm mechanization, electricity etc.

Irrigated Area

As indicated by the agricultural census 2010-11, India's total area under irrigation is 64.7 million hectares. Out of this most extreme 45 percent is shared by tube wells pursued by canal and wells. On the off chance that plenteous water is accessible, the farmers can grow a few crops else they need to grow just one crop on the same land in a year. Irrigation brings more land under cultivation. It changes the cropping pattern. The consistent accessibility of water for irrigation gives a feeling of dependability to the farmers and furthermore urges him to practice more up to date cultivating techniques and patterns to augment the productivity.

Farm Mechanization

Farm mechanization implies the utilization of machines and technology in the agriculture sector. It incorporates the utilization of tractors, tube wells, and plant protection. Mechanization improves work profitability and lessens human drudgery and furthermore helps in increments in cropping intensity.

Electricity

Electricity has assumed a noteworthy role in expanding the pace of agricultural production as around one-fifth of the total electricity production of the nation is used in pumping groundwater for agriculture. Thinking about the significance of irrigation and its effect on the development and growth of agriculture and allied activities, consideration should be centred on the improvement of the power sector in the nation.

4. Institutional Determinants

The institutional determinants which influence crop production include land holdings and agricultural credit.

Land Holdings

The average size of land holdings has been consistently diminishing because of the expanding number of landholders. From a normal of 2.28 hectares in 1970-71, it went down to 1.15 hectares in 2010-11 (Indian Agriculture Census, 2011). In India in excess of 82 percent of the farmers have a place with the small and marginal farmers' class and these farmers have less than 2 hectares of land (GOI, 2011). Such small land possessions by most of the farmers are insufficient to feed the

billions of populaces and furthermore, the decrease in the average size of land holdings is a noteworthy issue.

Agricultural Credit

Credit is the spine for every division of the economy. Credit encourages the farmers to meet the venture just as working capital prerequisites. Accessibility of credit for the farming area must be simple, sufficient, and convenient. Regardless of a huge system of Rural Financial Institutions (RFIs), a huge bit of the provincial populace is ceaselessly disregarded by the proper financial division in India.

5. Socio-Economic Determinants

Socio-economic factors are the major determinants of crop production. It includes population, literacy rate and poverty. The influence of population growth on agriculture will have a large impact on the ability of smallholder farmers to feed themselves, their families and urban population. Education creates awareness among the people to take advantage from the changing market situations and changes people's attitude to accept new and modern technologies which increase the crop production.

II. CONCLUSION

There are countless determinants that influence food grains production. Physical Factors are the climatic conditions which affects the food grains production of any region. Apart from soil and climatic conditions, the food grains production also depends on High Yielding Variety (HYV) seeds, fertilizers and pesticides. Various types of farm implements and machinery, cold storage facilities and adequate supply of power, good rural-urban road network, efficient transportation, developed agricultural marketing also has a positive impact on the growth of agriculture sector.

REFERENCES

1. Attri, S.D., (2006); "Climate Change and Agriculture – An Overview," Vayu Mandal, 32 (3-4), 10-26.
2. Das, P. (2002); "Cropping Pattern (Agricultural and Horticultural) In Different zones", At [Http://Agricoop.Nic.In/Farmmech.Pdf/05024-02-Pdf](http://Agricoop.Nic.In/Farmmech.Pdf/05024-02-Pdf).
3. DES, DAC (2010); Directorate of Economics and Statistics, Department of Agriculture and Cooperation at www.agricoop.co.in
4. Directorate of Economics and Statistics (2012-13); Department of Agriculture and Cooperation at www.agricoop.co.in
5. Elumalai Kannan (2011), "Trends in India's Agricultural Growth and Its Determinants", Asian Journal of Agriculture and Development, Vol. 8, No. 2.
6. IMD (2010); At www.imd.gov.in

7. IMD Annual Climate Summary, (2009); Published by National Climate Centre, Pune.
8. Indian Meteorological Department (2010) At imd.gov.in. Retrieved 3 March, 2011.
9. K. Krishna Kumar, K. Rupa Kumar, R. G. Ashrit, N. R. Deshpande and J. W. Hansen (2004); "Climate Impacts on Indian Agriculture"; International Journal of Climatology, 24: 1375–1393 (2004), Published Online in Wiley Inter science (www.interscience.wiley.com) Doi: 10.1002/Joc.1081
10. Kavi, Kumar K.S.; Parikh, J. (2001 A); "Socio-Economic Impacts of Climate Change on Indian Agriculture", at <http://enviroscope.iges.or.jp/modules/envirolib/view.php?docid=2012-14k>.
11. Kumar, A; Sharma, P; & Ambrammal, S. K. (2014). Climatic Effects on Food Grain Productivity in India: A Crop Wise Analysis. Journal Of Studies in Dynamics and Change, ISSN: 2348-7038, Vol. 1, No. 1, May 2014, 38-48. @Http://Www.Jsdc.Lokkatha.Com
12. Kumar, Dr. Pritee Sharma and Sunil Kumar Ambrammal (2015); "Effects of Climatic Factors on Productivity of Cash Crops in India: Evidence from State-Wise Panel Data", Global Journal of Research in Social Sciences Vol 1, No 1, April 30, 2015 www.gpcpublishing.com
13. Rao, V.U.M., Subba Rao, A.V.M., Bapuji Rao, B., Ramana Rao, B.V., Sravani, C. And Venkateswarlu, B. (2011). El Niño Effect on Climatic Variability and Crop Production: A Case Study For Andhra Pradesh, Research Bulletin No. 2/2011. Central Research Institute for Dryland Agriculture, Santosh Nagar, Hyderabad, Andhra Pradesh, India. 36 P.
14. T. Jayaraman, "Climate Change and Agriculture: A Review Article with Special Reference to India", Centre for Science, Technology and Society, Tata Institute of Social Sciences, Mumbai.