

The antecedents of Agriculture growth: an Indian perspective

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ABSTRACT

Majority of population in India is dependent on agriculture. There are various determinants that push and pull the agricultural growth. This study reviews on the perspectives of the earlier contributors with respect to the strong leadership, weather risk hedges, mechanization, research and extension reforms etc. that influence the agricultural sector. It also examines the triumph and failure factors of Indian agriculture compared to the other few economies like China. The results focus the possibilities of increase in production with existing technologies, enhanced management techniques and efficient resource development.

KEY WORDS: Agriculture, Growth, Leadership, Reforms, Compare.

1. INTRODUCTION

Agriculture plays a vital role in the developing economies like India where majority of population is still dependent on it. The Indian agriculture dates back to ancient period when it began around 9000BCE by farming of crops and domesticating animals which lead to the settlement of people. The Indian goods soon became famous around the world and trade flourished which introduced foreign crops also in India. Since then agro sector has undergone profound changes when irrigation and other sophisticated means were developed in agriculture during middle ages from 1200 CE to 1757 CE. But agriculture saw a complete turnabout in 19th century during British colonial era where it expanded by only 1% per year. Prices of commodities increased and soaring private investments. Later various reforms and policies were introduced which completely transformed Indian agriculture from its traditional ways with the advent of Green revolution in 1960s. It made India again self-sustainable but then steady decline of agriculture was noted. India later signed Uruguay Round Agreement (URAA) in 1980s which made Indian policies more liberal and integrated into the global agriculture which introduced more mechanization, irrigation and technological advancements (Gulati, 2002).

In the days of independence the contribution of agriculture to GDP was 70%. But anxious to develop other sectors agriculture is not given sufficient priority. During the period of reforms from 1980s the public investment in agriculture has seen steady decline. Due to this a high food inflation of 18% was recorded in the recent times. As most of the country still depends on agriculture the failure to reform agriculture would undermine the true development of the country. So the government is forced to take incentives and reform policies to give more priority to agriculture again. The green revolution and globalization of agriculture though increased productivity to an extent gave raise to new problems. This paper analyzes various dominant factors which enhance and diminish the growth of agro sector along with the comparisons of reforms in other developing countries like China which started implementation of Agricultural Research and Extension (AR&E) at the same time as India (Babu, 2015). The predominant factors are research and extension reforms, technology, farm size, availability of labor, farm size, weather conditions, crop insurance, fertilizers, information pertaining respective farming areas and strong leadership. **Statement of the Problem:** The backbone of Indian economy is agriculture. Though the contribution of agriculture to Indian GDP has decreased significantly due to the development of other sectors still majority of people are dependent on agriculture. The exports from Indian Agriculture contributed 39 billion dollars in 2013. India is the second populous country in the world with approximately 1.21 billion people. Domestic feeding of the people can only be done if agriculture of the country is prospered and farmers are to be seen that their needs are met. There would be no true growth of the country if it can't be self-sustainable. So this study aims to highlight the antecedents that affect the Indian agriculture to increase the productivity and prevent farmer suicides. Indian agriculture has two main monsoons the winter and the summer. Rabi crops are cultivated in winter and Kharif in summer. This diversified cultivation is vulnerable to the climatic changes. In the recent years due to unexpected climatic changes the production of agriculture has declined. Weather plays a key role in the agriculture to this day as many farmers still opt for traditional agriculture methods (Sharma & Vashishtha, 2007).

Government has introduced many subsidies to farmers for the input of agriculture to provide the financial support. But not all the promises and policies are being fulfilled. Lack of strong leadership to oversee and implement the reforms is an issue. As Indian agriculture is susceptible to the weather conditions or if the crops are lost by any other means the farmers face a huge loss which may result in farmer suicides. Ignorance of farmers to insurance the crops need to be addressed.

Private investment has soared in the agriculture. This causes lack of finance for the farmers and decreased productivity. Farmers are still dependent on the traditional means of agriculture which is no longer reliable to meet the huge demand of commodities. Mechanization is needed to increase the yields. In recent days the availability of labor has become a huge issue as some policies from the government prevent it. These policies provide labor free rations making them lazy and unwilling to work. This increased huge unemployment in rural areas and unavailability of labor. This concept of 'free lunch' without hard work is a problem. Innovation in agriculture is important. But the research and extension reforms are not being given sufficient priority (Babu, 2015). There is a strong information divide between the providers and the consumers and due to this supply and demand suffer. This gap should be bridged. Lack of education on the methods of agriculture of farmers is one of the major hurdles. The farm size and allocation of farms is not being done ethically (Sandhu, 2012).

Review of Literature: Indian agriculture is mostly dependent of weather conditions. According to Sharma & Vashishtha (2007), reviews the needs of averting these risks by using weather derivatives for risk management. The traditional risk managing techniques are costlier and unpredictable. Another issue here is the farmers don't bother knowing about weather conditions which affect the production of crops. This paper also suggests that in a country like India where the summer and winter are extreme the weather derivative contracts would be useful to avert the risks of unknown weather.

Ali and Bardhan Gupta (2011), reviews about the importance of analysis of futures price and spot price for agricultural commodities as government intervention is getting reduced and private participation is being increased to manage the price discovery and price risk management. The findings show that co-integration between futures and spot prices exist in almost all selected agricultural commodities except in the cases of wheat and rice. The main problem identified is that the farmers try to sell immediately after harvesting without any idea of future prices which creates major concerns for producers and consumers without waiting for the opportune time. This lack of co-integration of wheat and rice in India may be due to numerous reasons like less developed futures commodity exchanges and greater intervention of government in terms of minimum price and market procurement and manipulation by large market traders. This may indicate that wheat's futures price in India is not very efficient. The co-integration and causality used in paper though with limitations is still very effective in determining the future and spot prices in India.

Tan and Rajan (2015), reviews regarding TFP growth across various states of the country. The paper finds that the TFP is highest in western regions with Gujarat ranking 1st and lowest in the eastern regions like Bihar. The TFP growth can be mainly attributed to the technological development. The states with good technology investments have good TFP. Though agricultures contribution to Indian GDP has been decreasing the largest work force is still in agriculture so in order to develop TFP investments in public research is crucial. The author suggests that the states must implement the best of what they have in agriculture. NGOs can be called upon for help.

Sandhu (2012), review about the level of EET (Entrepreneurship Education and Training) in families that operate small firms and traditional occupations. The paper examines that the EET is found to be pretty low and the need to raise the education is important by changing the system of education in India which mostly focuses on theoretical than businesses and few practical applications. The demand of small farmers etc. for support in terms of information and finance suggests information gap and it would be nice if the rural banks and volunteers step up to solve this issue.

Gautam and Yu (2015), review the comparative study of India and China regarding the total productivity growth. The study finds that the TFP growth of China is around 2% and that of India is 1%. But the agriculture of India is more exposed to the weather conditions compared to China. It is found that there should be changes in certain policies in India to increase productivity and increase investment in R&D to use advanced technology and increase diversification. But certain measures are to be taken in modifying the policies considering the negative effects such as greenhouse emissions, over pumping of ground water without decreasing the efficiency of production. Future studies are required to take into consideration the negative effects such as soil degradation and water quality decline for productivity analysis.

Sonit Singla and Mahim Sagar (2012), reviews the need of crop insurance to avert risks and the steps to be taken by the insurance companies to encourage small farmers. The author crop insurance is effective way to deal with loss of crops and less revenue by transferring their risks to the third party. Advisory services, providing agricultural inputs for lower prices, credit facilities by insurance companies would help farmers to involve in insurance. The paper suggests that the financial risk derivatives can be used by companies to encourage and on behalf of marginal farmers.

Arthur A goldsmith (1991), reviews the separate case studies of Nigeria and India and how the agricultural reforms in Nigeria failed compared to India. The main reason can be attributed that the lack of institutions and political reforms failed Nigeria whereas Delhi implemented them correctly. And furthermore there was lack of coordination and no proper technology was used in Nigeria. So the political stability is found to be main driving

force along with the eagerness to improve the situations of the country helped India to be successful in agriculture and Green Revolution also played a huge role in the process.

Pranab K Bardhan (2001), reviews about the output of agriculture based on the farm sizes analyzed from 1000 farms. There seems to exist inverse relationship between farm size and output per acre, and imperfection in the labor market.

Sahoo and Mohapatra (2008), paper reviews about the agricultural disparity present in the 15 major states of India. It is found that the states of western and southern India are more developed agriculturally than the states in north and eastern province. It is found that the reasons for this is because the agriculture is still mostly depending on the individual culture and traditions which differs across states. And some states are affected by droughts. Pucca road and policies of different states also seem to influence these changes majorly.

Vijay Paul Sharma (2012), reviews about the reforms in India. Though many reforms were introduced in India; the agriculture and poverty reduction have not reduced considerable attention. As a result the agro sector has suffered and drought conditions in 2009 have created high food inflation. The author suggests that the research and price policies should be modified and done according to the technology used. Electricity, irrigation, fertilizers should be fairly priced. The subsidiaries should be better targeted for the poor farmers and strict implementation of such policies are required. The author advises that more participation of private investments should be encouraged in agro dependent sectors.

Mukherjee (2001), inspects the issues of agriculture. The author finds that there has been steady decline of agricultural productivity. Few reasons are unequal distribution of land and income, disparities in the level of unemployment in the rural areas, no stringent policies, nonagricultural sector importance, un ethical land holdings.

Lau and Yotopoulos (1971), discusses about economic efficiency and its importance. The author highlights that the economic efficiency is the best way to know the output of farms based on the sizes. With these results we can make policy changes, land redistribution etc. therefore it is advised to measure economic efficiency using effective approach.

Jhunjhunwala (2001), analyzes that with the advent of green revolution India became self- sustainable in agriculture. It introduced mechanization, fertilizers, irrigation which were not earlier part of traditional agriculture. This paper finds that this has created new issues like new pests and their susceptibility to fertilizers, unemployment, and unequal income, breakdown of traditional agriculture structure and stability, ecological issues. This paper highlights the importance of introducing tractors and found that in farms where mechanization using tractors are implemented the yield is high which prompted the states like UP to introduce schemes for tractors.

Singh (2014), reviews that during the period of reforms from 1980s the public investment in agriculture has seen steady decline. This is due to the fact that instead of direct investment the funds are going to subsidies in the form of irrigation, fertilizers, current etc. the diversion of funds from agriculture to more anti-poverty schemes increased pressure on revenue expenditures and income distribution which further trapped poor farmers. The author advises that a change in the policies is required and more cold storages, rural roads, loans etc. should be provided to the farmers to prevent their increased number of suicides.

Khan (2007), studies that the interstate disparities of credit flow have decreased from pre liberalization era to post liberalization era. The average cost of institutional credit was low in pre period. The coverage has improved in the post period in all 4 southern states, Punjab, H.P. The author suggests that the institutional agencies should make disbursement of production cost to keep up with the increasing prices.

Deepika (2007), reviews on the low tariff policy. The author advises that the low tariff policy would be very beneficial for Indian agriculture as it would increase trade gains due to reduction of prices in the manufacturing sector.

Kaushik and Khanna (2011), reviews the importance of food industry in the growth of agriculture. Food industry plays a vital role in creating synergy between agriculture and industry. It would create more employment, income for farmers and enhance thus productivity of agriculture. Thus the author suggests that the food processing industry should be developed by increasing technology, good infrastructure and sufficient care as it would enhance agriculture.

Gulati (2002), paper reviews about agricultural changes after India signed Uruguay Round Agreement on Agriculture (URAA). India took away the restrictions on exports which were present till 1980s. Indian policies have become much more liberal. Indian agriculture is being slowly integrated into the global agriculture. But volatility of global prices is a issue. Few countries subsidize the exports which is being caused to undermine small farms and raise in tariffs.

Babu (2015), reviews the comparison of developing countries like China and India and their implementation of agricultural research and extension (AR&E). The reforms that were undertaken by both the countries are different. While china used Bottom-Up approach it made all the small rural farmers beneficial by increasing their income. India used Top-down approach but did not achieve desired results due to lack of strong national leadership to co-

ordinate effectively all the incentives taken. The common challenges faced in the developing countries are due to information divide and inadequate amount of funds. The agricultural extension system of India has become pluralistic which requires higher level of co-ordination. Though Indian research has good innovations the implementation of them is becoming difficult due to lack of government and NGOs support. As research systems are key strategies to improve productivity more concentration should be given for public research and investments should be welcome in that field. And the recent reforms of promoting extensive public services in China has become successful increasing the access to rural population. This clearly indicates that India should shift from traditional top-down approach to bottom-up process which meets the needs of diversified extension services. But this shift in India would require strong political commitment and financial investment to effectively develop local extension services for effective transfer of agricultural technology and information to rural population.

Agriculture in India: Indian agriculture underwent a lot of structural changes since its origins from ancient times. The period of Indian agriculture can be briefly divided into five different periods before gaining its independence in 1947. They are

Early History (Before 1500BC): This is the period of Neolithic revolution agriculture was very from the dominant mode of support from humanities. Agro pastoralism in India included threshing, planting crops in rows either of two or of six and storing grain in granaries. Barley and wheat cultivation along with the rearing of cattle, sheep and goat was visible in Mehrgarh by 8000-6000 BCE. Wheat, barley, cotton, rice were dominantly grown during this period. The Indus valley farmers also grew peas, sesame and dates. Sugar cane was also cultivated in tropical Southern India. Indus Valley Civilization prospered due to their innovation in agriculture and development of first early irrigation facilities during this period.

Vedic period (1500BC-200BC): It is likely that summer monsoons were longer during this period (Gupta, 2004). First cultivation of Jute was done. Pipal and Banyan trees were domesticated and worshiped. The Mauryan Empire started building dams and categorizing soils for agricultural purposes. Dams were built and horse drawn carts were used to plough instead of bullock carts. Ayurveda came into existence during this period. India has many huge mountains which abound in fruit trees of every kind, and many vast plains of great fertility. The greater part of the soil, moreover, is under irrigation, and consequently bears two crops in the course of the year. In addition to cereals, there grows throughout India much millet and much pulse of different sorts, and rice also, and what is called bosporum (Indian millet). Since there is a double rainfall (i.e., the two monsoons) in the course of each year the inhabitants of India almost always gather in two harvests annually.

Early common era (200-1200AD): A wide range of crops were cultivated such as Jackfruit, coconuts, beans, black pepper, various grains, tamarind, turmeric, sandalwood. Manuring was done using cow dung and sophisticated irrigation facilities were practiced. Trade of agricultural commodities to Roman Empire, Mediterranean and the Chinese flourished. Spices of India were famous for the trade. The growth of individual disposition of farming property may have led to a decrease in areas of dry cultivation. The Cholas also had bureaucrats which oversaw the distribution of water particularly the distribution of water by tank and channel networks to the drier areas.

Late middle ages (1200-1757AD): This era brought the fusion of Persian and Indian agriculture. Indian crops were spread throughout the middle-east, Spain, Africa. Foreign crops entered India. Land management was particularly strong during the regime of Akbar the Great, under whom scholar bureaucrat Todarmal formulated and implemented elaborated methods for agricultural management on a rational basis. Indian crops such as cotton, sugar, and citric fruits spread visibly throughout North Africa, Islamic Spain, and the Middle East. Though they may have been in cultivation prior to the solidification of Islam in India, their production was further improved as a result of this recent wave, which led to far-reaching economic outcomes for the regions involved.

British era (1757-1947 AD): Irrigation canals were built on river Sutlej. But the irrigation works provided by British did not meet the demands of farmers. The Indian crops like cotton, opium and rice were taken into the world market by the British. But the steady decline of agriculture started during this period. The production grew only at a slow rate of 1% per year in the 19th century. The prices of agricultural commodities rose thrice between 1870-1920. Various departments to control famine and improve agriculture were formed during this period.

Post-Independence (1947 AD onwards): The contribution of agriculture to Indian GDP was 70% during this period. Campaigns to grow more food (1940s) and Maize improvement project (1950s) along with various incentives to promote cash and food crops were implemented. But Indian agriculture started declining rapidly due to lack of finance and famines. There was serious need of change in the methods of implementation of agriculture.

Green Revolution became a boon with its arrival in India in 1960s. Hybrid seeds, fertilizers, mechanization, new forms of irrigation were introduced. India became self-sustainable again. With the introduction of new reforms in India during 1980s the agriculture was given institutional shape which encouraged innovations in agricultural sector. But the stringent policies on the trade did not let in the proper export of the goods. Furthermore the reforms wanted to lift other sectors on the country too. So agriculture was not the only sole goal to be developed.

New Economic policies were introduced again in the 1990s which addressed the problems faced by agriculture in 1980s which did not allow trade under protectionist industrial and trade policies. So new reforms brought forth Liberalization of agriculture which allowed openness of trade. This free trade increased the efficiency of agriculture as exports were encouraged by depreciating of the value of rupee in 1991. Further Trade Liberalization caused the downfall of prices in the domestic market for the agricultural goods. But after mid 1990s the agriculture exports and contribution to GDP started declining again as the promise of growth and development in the productivity of export related crops was not fulfilled.

The contribution of exports in 1995-96 to 2003-04 fell from 7.6% to 6.9% in GDP of the country. The following periods displayed the trends of instability in the exports and imports. Agriculture is still on the trend of declining in the 2000s period and in the late 21st century food inflation has increased in India. In 2013 food inflation was found to be 18.4%.

2. CONCLUSION

Since the time memorial it can be clearly seen that the significance of agriculture hasn't been altered. Most of the population in the country still is dependent on agriculture either directly or indirectly. In the view of this context many antecedents play building blocks of agriculture development. It is high time that a strong leadership is required to oversee the agriculture growth by implementing the policies and subsidies correctly. The policies that create rural unemployment by providing 'free lunch' should be reformed so that the unavailability of labor problem can be solved. Proper finance should be provided with good irrigation facilities. Subsidies for inputs of agriculture on fertilizers, mechanization, and current can be provided. Financial institutions can step up give credit facilities for marginal farmers in order to encourage crop insurance. The sufficient information and education should be given to the farmers by government institutions on agriculture and advanced methods of agriculture from the world. The rural banks should be approachable. Private investment into agriculture should be more encouraged along with the interaction between the buyers and the suppliers to analyze the market risks, demand and supply. Weather related information should be updated to the farmers frequently by Agriculture related programs on radios or Television by analyzing using weather risk derivatives. Sufficient role models can be taken from the successful developing countries like china and their reforms like bottom up approach can be seen if it can be implemented here. To conclude, for an agrarian country like India, Agriculture is the backbone and it should forever be self-sustainable. Research needs to be given more priority to encourage new advancements in agriculture in order to increase the productivity. Since there are lots of disparities between the states in India and diversified crop cultivation state governments should undertake policies pertaining and suitable for the agriculture of that state.

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