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AN ANALYSIS OF STRUCTURAL TRANSFORMATION OF AGRICULTURE IN INDIA

Ashwini Suraj Devadiga[1], Dr. Shripathi Kalluraya P[2]
[1]Research Scholar, Department of Post Graduate Studies and Research in Economics, Mangalore University, Mangalgangotri-574199
[2]Rtd. Professor and Research Guide, Department of Post Graduate Studies and Research in Economics, Mangalore University, Mangalgangotri-574199

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ABSTRACT----------
Agricultural transformation and its development are multidimensional, it includes a variety of aspects like agricultural land utilization, intensity of cropping, crop productivity, crop concentration, crop diversification, crop combination, commercialization of agriculture, nature of agrarian relationship, and maintenance of ecological balance and so on. Agriculture plays an essential role in the process of economic development of less developed nations like India and agricultural development is an integral part of overall economic development. This paper, intends to analyse the nature of structural transformation in agriculture in India, and to determine the factors responsible for the structural transformation of agriculture.
KEYWORDS: *Agriculture, agriculture transformation, structural transformation----------*

INTRODUCTION

The Food and Agriculture Organization of the UN, classifies India as the World's seventh-largest country along with a population of about 135.26 crores in 2018, with an immense diversity in climate topography, flora & fauna, land use patterns, and socio-economic conditions. For about 140 years, India has experienced remarkable land use and land cover changes, including deforestation, cropland changes, and urban expansion. With over half of the territory being used as cropland, it makes India, one of the largest producing countries of agricultural commodities worldwide. In the year 2016, the agricultural sector comprised about 23% of the total economy as measured by the gross domestic product and employed around 59% of the country's total labor force.

India is home to one of the largest populations, 175.7 million, living below the World Bank's poverty line of $1.90 a day, with two-thirds of the Indian population living in rural areas, with a relatively high poverty rate. With this depth of poverty, agriculture becomes their only source of survival as the agriculture sector provides fodder for livestock and poultry, which provide food in the form of milk, meat, egg and it meets the food requirement of the people. The agriculture sector could be termed as the neutralizing agent of the country's negative balance of trade. Agricultural products like tea, sugar, rice, tobacco, cotton, spices, etc constitute the main items of exports of India and it has a great significance in the foreign exchange earnings and for the economic development of the country.
The development of the agricultural sector leads to the marketable surplus and it is a source of support for railways and roadways that transport the bulk of agricultural produce from farms to the mandis and factories. Institutional credits play a vital role in the development of the agricultural sector as credits act as a means to provide control over resources to enable farmers to acquire the required capital for increased agricultural production. Credit plays a pivotal role in agriculture by facilitating technological up-gradation and commercialization of agriculture. Agriculture has been the major source of raw materials to the leading industries like cotton and jute textiles, sugar, tobacco, etc and according to a UN survey, the industries with the raw material of agricultural origin accounts for about 50% of the value-added and about 64% of all jobs in the industrial sector in India. Thus, it can help generate capital in the country and also stabilize the economy even during the times of economic crisis as the agricultural sector continues to produce as it deals with the necessities of life and involvement of heavy fixed cost by the producers, thus, it provides stability and boosts the non-farm sectors in various ways.

Agriculture occupies an important place in the development process of any country as any program of economic development cannot succeed unless it is backed by a strong agricultural base. In a country like India, with a majority of people engaging in agricultural-related activities, it has a wider role to play in the economic prosperity of the country. Thus, agriculture is an essential pre-condition for the overall development of the economy.

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OBJECTIVES

1. To analyse the nature of structural transformation in agriculture
2. To analyse the factors responsible for the structural transformation of agriculture

METHODOLOGY

This paper is based on secondary data which includes sources such as published sources of data, government websites, magazines, articles, journals, e-magazines, newspapers, etc.

AGRICULTURAL TRANSFORMATION

Agriculture has been an important aspect of the traditional feudal economy and the transformation from feudalism to capitalism necessarily implies a transformation of agriculture. The agriculture sector has evolved over a while, from basic food-gathering activity to an intensive production system, basically, due to settled life, population growth, and increase in income, urbanization, technological revolution, and liberalization of international trade. It should also be noticed that, the agriculture sector accounts for the bulk of the country's economic output and a large share of the labour force.

As countries develop, manufacturing and service sectors also expand at a rapid pace and as a consequence the shares of these sectors also expand in the overall GDP. The labor force also starts moving out of agriculture to the manufacturing and service sectors which in turn leads to a fall in the share of the agricultural sector in GDP and also the share of the labor force employed in the agricultural sector. Another change that follows the transformation is the demand for agricultural products, both food and non-food. The food demand shifts from basic cereals to high-value products such as dairy products, fruits, and vegetables along with meat and meat products and processed products due to income growth, urbanization, and trade liberalization. As the consumption of high-value agricultural products rises, the output of the agriculture-food industry, which includes processing, wholesale, and retail also expands.

It could be said that over the past fifty years the structural changes in the Indian economy and its agriculture has been slow. The divergence of productivity of labor between the non-agricultural economy and the agricultural sector is widening and so is the difference between the share of labor in agriculture and the share of agricultural output in the economy. The economic growth has shifted consumer demands away from cereals, pulses, and oilseeds towards horticulture and livestock products that have higher income elasticities.

The transformation of the Indian agricultural sector has been driven by several factors, like the supply-side factors such as the policies to push growth, better and efficient use of resources like land and labor, the introduction of new technology and increased use of modern inputs like chemical fertilizers and expansion of irrigation infrastructure and investments on general infrastructures like roads, power as well as demand-side factors such as population, income growth, urbanization and demand from the rest of the world through gradual liberalization of international trade.

Structural Change in Indian Economy

'Structural Transformation' describes the process of change in the production structure of an economy and example of one such transformation was the Industrial Revolution in between 1700-1800s in England and Continental Europe and North America. It marked a shift from an agrarian society to an industrial society, from artisanal manufacturing to mass production. And as economies grew and urbanized, service from commerce, finance, and the state also became increasingly important.

Whereas, in developing countries, structural transformation started lately around the 1900s. The process occurred less gradually, even abruptly and dissimilarly in some cases. The general trend however was from mostly agrarian to a mix of agrarian, industry, and service economies. Along with this trend, there evolved two features, firstly, there occurred a process of human and labor migration from rural to urban areas and secondly, there occurred again in total factor productivity associated with a shift from traditional to modern forms of production. Moreover, structural transformation can be witnessed within the agricultural sector, like modernization in the mode of production and market transactions, integration with the other economic sectors, and even other countries.

The structural transformation of the agricultural sector is characterized by the relative decline of the basic agricultural practices, the rising importance of agribusiness, that includes, value-added for agro-related industries

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and agricultural trade and distribution services as well as the growing share of high-value agricultural products in international trade concerning traditional exports.
Though the structural transformation has begun in India, it is not yet generalized, for instance, in the early 1900s the economic and agricultural production structures differed strongly among states and the share of agriculture declined in all states while the share of services increased. While the share of manufacturing grew in Punjab it declined in other states. Despite rapid economic growth in the last two decades, the structural change in the Indian agricultural economy has been slow and atypical and while economic growth accelerated, agricultural growth lagged.

The share of agriculture in GDP is declining sharply while manufacturing has a low and fairly stable share, the share of the service sector has increased sharply followed by industry (other than manufacturing). As a consequence, labor has moved from agriculture to the non-agricultural sectors, and instead of getting employed in formal sectors of the urban economy, they have fallen to the informal sector jobs and self-employment in the vibrant rural non-farm sector leading to stunted structural transformation.

The rising per capita incomes also have led to the increased food demands and the share of livestock in production has increased since 1971 while that of horticulture increased since the 1990s. it could be observed that since the late 1960s the share of pulses and oilseeds and other crops has been declining steadily and until around 1996 the share of cereals was the highest at around 35% but has been declining rapidly since then as a consequence of the accelerating income growth.

Over the past decades the differences between output and labor share of agriculture have widened significantly in India, suggesting little structural transformation. And while, in the early 1990s as economic growth accelerated, the agricultural growth rate failed to accelerate. And as a consequence of high non-agricultural growth, low agricultural growth, and the growth of the agricultural labor force, the ratio of labor productivity in the non-agricultural sector and the agricultural sector has widened at an accelerating rate.

With such trends, one would expect an increased difference between urban and rural poverty rates, between urban and rural per capita incomes and consumption, but that has not been the case as the rural poverty rate (using poverty line according to the Lakdawala Methodology) declined from 50.1% in 1993-94 to 25.7% in 2011-12, while urban poverty declined from 31.8% to 13.7%. There has been a rise in employment and income in the rural non-farm sector and this growth implies that there is a structural transformation of the Indian economy whereby the labor moves from agricultural to non-agricultural sector. However, it is the stunted structural transformation and has generated a few good jobs in the urban economy due to the failure of the urban economy to create enough jobs, especially in labor-intensive manufacturing. However, the growth in the non-farm sector has prevented the rural economy from falling dramatically behind the urban economy. And rapid rural income growth will depend on continued urban growth spill overs and a significant acceleration of agricultural growth.

In India, the agricultural sector plays a pivotal role in the economy. Though India achieved self-sufficiency in food grains, particularly in rice and wheat due to the green revolution, the need to move beyond the green revolution was felt as it had neglected rain fed areas, nutrition crops like millets, non-cereals and to provide resources to poor farmers. It also contributed to ecological and environmental sustainability problems. Although, its contribution to GDP is today around 1/7th, it employs about 48% of the Indian workforce and there are also substantial linkages between agricultural and non-agricultural sectors.

In today's context it becomes necessary to focus more on the agricultural sector due to its low growth, which is 2.5% per annum in the last four years, agrarian distress in terms of low agricultural prices and farm incomes, farmer's suicide across the country, etc. The agricultural sector also faces several other problems relating to sustainability, stagnant yields, waterlogging, soil erosion, volatility in prices, natural calamities, and the small size of the farms.

With all these, the narrative of Indian agriculture has been changing in recent years due to factors like urbanization, globalization/ de-globalization, tariff wars, diversification within the agricultural sector, fast-growing rural non-farm sector, developments in value chains, start-ups, technological changes including IT, climate change and due to more emphasis on sustainability than before.

The crop production has significantly increased in the last decade, for instance, food grains production was 275.7 million tons while pulses production was about 24 million tons in 2017-18. India also witnessed a horticultural

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revolution as the production was 305 million tons in 2016-17. And the production of fruits and vegetables was 93 million tons and 178 million tons respectively in the same year.
The agricultural development in India has three goals; they are 1. Achieving high growth by raising productivity; 2. Inclusiveness by focusing on lagging regions, small farmers, and women; 3. Sustainability of agriculture.

Phases of Growth and Structural Change
Phase I: Independence to mid-1960s: it was the phase in which there was an acceleration in the pace of growth in comparison to the preceding colonial period. It was accompanied by the process of structural change marked by the increasing share of the non-agricultural sector, driven chiefly by the industrial sector.

Phase II: Mid 1960s to 1980s: this phase the momentum of industrial growth slackened and the trajectory observed in the first phase started winding down.

Phase III: 1980s to early and mid-1990s: in this phase, there was a second stage growth acceleration accompanied by a shift towards the ascendancy of the service sector relative to the industry in growth. The rising share of the public sector was the main source of the increasing share of services in GDP.

Phase IV: mid-1990s onwards: this phase saw a rapid growth of private sectors relative to the public sector and a shift towards service sectors relative to industry that led to the decisive reinforcement of services dominated growth trajectory.

Structural change indicates qualitative transformation and evolution of the economic systems, usually marked by technological progress and organizational changes as technological factors, knowledge, and institutions are all elements that contribute to the process of structural change. The structural change refers to the process of combining economic growth with the changing share of different sectors in the GDP and labor force. It follows a sequence of shift from agriculture to industry and services. According to Fisher and others there is a need for the countries to transform their structure away from agriculture with low productivity of labor towards industrial activity with high productivity of labor.

It could be noted that every underdeveloped economy is characterized by a larger share of agriculture in domestic income, with development, the share of the industrial sector increases and that of agricultural sector falls and as the level of development rises, the share of service sectors increases. The structural shift and changing sectoral shares happen not only in domestic products but also in the shares of the employment. The perceptions that, with structural change and economic development, the relative importance of agriculture sector falls, along with the rising share of secondary and tertiary sectors has led to the underestimation of the role of agriculture in the process of economic development.

Factors Responsible for the Structural Transformation of Agriculture in India
There has been a notable increase in India's agricultural productivity over the past few decades and at the same time there are significant yield gaps for many crops across the country. This prevalence of yield gaps can be due to factors like the prevalence of subsistence farming and poor access to chemical inputs, improved technology, and management techniques.

Today, there has arisen a need for increased food production due to an expected population growth of more than 1.6 billion in 2050 along with changing dietary preferences like higher demand for animal-sourced products. At present, India provides food to 18% of the world's population. Studies conducted by Mauser and others show that, India has a large potential for increasing agricultural productivity and this could be achieved by improving the management practices and adopting new crop varieties. To realize these aspects, investments in research and development in the agricultural sector has to prioritize.

1. **Cropping Pattern:** The cropping pattern in India, has undergone significant changes over a while. As cultivated area remains more or less constant, the increased demand for food as a result of growing population and urbanization puts agricultural land under stress resulting in crop intensification and substitution of food crops with commercial crops. The food crops are grown to fulfil the food grain demands and the Green Revolution was a turning point in Indian agricultural history as the farmers began to employ technological tools and hybrid seeds in farming. Thus, Indian agricultural transformation can be summarized under three stages of transformation, they are; pre-green revolution period; the green revolution period, and the period of economic reforms. The period of the pre-green revolution saw around 80% of the net sown area covered with food grain crops, which gradually lost its share at a nominal rate

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during the green revolution period and further lost a further 60% share during the economic reforms period. And the definite reasons for this could be the changes in the land use pattern, high productivity in food grains, and crop diversifications.

Amongst the major crops, rice, wheat pulses, and oilseeds occupy a significant proportion of the total cropped area in the country. And the area under rice saw an increase from 34 million ha in 1960-61 to about 45 million ha in 2000-01 which later declined to 44 million ha in 2014-15. Similarly, wheat production increased rapidly, and maize crops showed fluctuations yearly with a positive trend, whereas the bajra crop declined sharply owing to low profitability. The production of pulses has remained more or less stable necessitating large scale imports to meet the requirements of the increasing population. The oilseed crops covered a larger proportion but due to an increase in area under irrigation and increased production of rice and wheat made it difficult for its increased production. Sugarcane and cotton crops too observed significant fluctuation from year to year.

2. **Agriculture Marketing:** The structure of the agricultural market is distinct from other types of commodity markets as agricultural produce has to pass through a wide variety of markets and change hand several times before it reaches the final urban consumers. For a long period, Indian agriculture was mostly like 'subsistence farming' later changes took place and the problem associated with the middlemen, money lenders, wholesale- retailers, malpractice in the mandies, less incentives, lack of transportation and credit facilities so came in leading to fluctuations in the agricultural productivity.
3. **Agriculture Credit:** The agricultural credit system of India consists of formal and informal sources of credit supply. The formal sources include commercial banks, cooperatives, and micro-finance institutions and informal sources include, friends, relatives, commission agents, traders, private money-lenders, etc. Credit is a critical input that affects agricultural productivity and thus, impulses in the agricultural operations are sought through the intervention in credit.
4. **Land use Pattern:** the total geographical area of the country according to the Surveyor General of India is 328.73 million hectares and the net area under cultivation of various crops was 133.20 million hectares in 1960-61, which increased to 140 million hectares in 1980-81 accounting for about 46% of the total geographical area. Since then there has been no significant increase in the net area sown. The gross cropped area increased faster than the net area sown as the area sown more than once had increased from 19.57 million hectares in 1960-61 to 57 million hectares in 2010-11. The gross cropped area was 152. 77 million hectares in 1960-61 and it rose to 199 million hectares in 2010-11. Whereas the net area irrigated has shown a marked increase over time touching a level of 66.1 million hectares in 2012-13 as against 24.66 million hectares in 1960-61.
5. **Agricultural Labourer**: according to Sir Thomas Munro, 1842, there was not a single landless labourer in the country. However, according to the first census of 1881, the number of landless labourers was 7.5 million and it rose to 25 million in the 1911 census which is around 20.6 % of the total working population. It further rose to 27.3 million in 1951 and in 2001 it was about 106.8 million which accounted for about 32.3% of the total labour force. And according to the 2011 census it is about 494.9 million.

Factors Responsible for Low Productivity

Several factors contribute to the low productivity of Indian agriculture and they can be listed as:

1. **Rural Environment**: the rural environment is inclusive of illiteracy, superstitious beliefs, primitive outlooks, conservative, and unresponsive to the modern methods of cultivation, thus it directly or indirectly leads to low productivity. And according to G S Sahato, the marginal productivity of farmers is zero in agriculture due to the family-based cultivation process.
2. **High Land- Man Ratio**: according to the 2011 census report of India, about 68.84% of the total population live in rural areas and the majority of them are engaged in the agricultural sector and thus high levels of population leads to uneconomic subdivisions of land which further leads to low productivity.
3. **Degradation of Land**: land degradation refers to the process of land losing its natural productivity due to human-caused interventions. According to the Government of India, about 329 million hectares have already been degraded which results in 33 to 67 percent of yield loss and about 5% of the land has been damaged so badly that it cannot be used at all.
4. **Existence of Big Farmers**: although the zamindari system has been abolished in India, the rural big farmers still paly a shadow role in determining or regulating the rent, tenure system, and rights of tenancy of tenants and as a result, the positions of tenants are worsening day by day. This system makes it difficult to increase productivity just by the application of modern technologies as the life of tenants itself is not secure.
5. **Irregular and Inadequate Credit and Marketing Facilities**: due to insufficient and inadequate availability of agricultural loans at a minimum rate of interest, the poor farmers find it difficult to invest

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on the land during the peak seasons of cultivation and on the other side the regulation of the marketing of the crops by the middlemen or touts makes these farmers more vulnerable towards exploitation. These could also result in low agricultural productivity.

6. **Lack of Modern Technologies**: the machinery, hybrid seed varieties, etc. are used by the rich farmers, whereas the poor farmers are not in a position to utilize these technologies and lag behind. For example, a report of 2013-14 says that only about 36.7% of the total agricultural land in India was reliably irrigated and the remaining 2/3rd cultivated land was dependent on monsoons. Thus, the package program under the green revolution turns to be ineffective in most of the gross cropped areas in India.

CONCLUSION

The sharply accelerating growth of India has had a positive impact on all states as all states had significantly higher economic growth rates than in the last two decades of the 20th century. But the situation is different in agriculture, where growth rates slowed down between the 1980s and the 1990s and it did not exceed 4% in the past decade. Until the early 1990s the more advanced states had higher economy-wide growth and agricultural growth, but these associations have disappeared since 1992, suggesting a sharp change in economy and agricultural growth opportunities. Significant convergences of the output and labor shares of agriculture in the overall economy have occurred in Kerala, Punjab, Haryana, and Maharashtra. Convergence has also begun in West Bengal and Tamil Nadu but with the gaps between the output share and the labor share of agriculture having narrowed only slightly. Thus, it could be said the structural convergence of the economy has started, suggesting that faster growth may bring structural transformation closer than what the national picture suggests.

The economy shows common trends in the differing structural transformation across the states, but with significant variations across the states. The share of agriculture in the economy remains the highest in Punjab followed by West Bengal and Madhya Pradesh, while it is the lowest in Tamil Nadu, Kerala, Maharashtra, and Gujarat that vary slightly around 10%.

We find states with good and poor agricultural endowments in both groups, suggesting that the change in the share of agriculture is heavily influenced by the changes in the other sectors of the economy. The share of services increased in all the states, but at widely different rates. The share of manufacturing was mostly on a downward trend, except in Punjab. In agriculture, all states reduced their cereals share and increased their share in horticulture.

The widely differing initial agricultural production patterns and their diverging trends over time, cannot be related to their initial per capita incomes or their growth. While at the national level the drop in the share of cereals and the rise in the livestock share are a reflection of per capita income growth. How these trends play out in the states are influenced by changing opportunities for inter-state trade, changing comparative advantage, and state-level policies and programs.

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