

Indian Agriculture in New Economic Regime, 1975-2015: With Specific Focus on Major Food Grains

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ABSTRACT

Agriculture in India is the most important segment of the economy. Growth of agriculture sector is crucial for Indian economy as it employs two- third of its population and contributes nearly one-third of national income. Hence the trends in Indian agriculture and the determinants of agriculture gross domestic product during the pre and post WTO regime based on Cobb Douglas production function was analysed. The study is based on secondary data for the period of 40 years from 1975-76 to 2014-15. The trend in area and production of major food grains (rice, wheat, coarse cereals and pulses) is analysed for pre (1975-1994) and post (1995-2015) WTO regime. It is concluded that, food grain production in India shows a positive growth after WTO regime but comparatively less than the before WTO period. Indian agriculture sector witnessed increasing returns to scale before and after WTO regime. Increase in the amount of fertilizer and pesticides no longer contribute to the growth of agriculture GDP.

Introduction

Agriculture in India is the most important segment of the economy. Growth of agriculture sector is crucial for Indian economy as it employs two- third of its population and contributes nearly one-third of national income. The importance of agriculture sector in the process of economic development is indispensable. With recognition of this fact, Indian planners have emphasized on the development of agriculture and allied sector right from the beginning of the economic planning process in India Kamat et al (2007).

Khor (2005) stated that pounding pressure of the developed countries on the developing countries for market entry into developing nations and to open up their agricultural, industrial service sector could not bring any success of the Doha round. In fact the low priority has been accordance to the implementation issues related to the Uruguay round and special and differential treatment (SDT); these were excluded from the list of discussions after the Cancun Conference 2003. Dubey (2006) points out that the outcome of WTO conference held at Hong Kong is that European Union (EU) countries agreed to eliminate export subsidy.

Several policy initiatives have brought the changes in Indian economy in the scale of production of food grains, and area under cultivation in agriculture sector. Therefore The paper on “Indian Agriculture in New

Economic Regime, 1975-2015: With Specific Focus on Major Food Grains” focuses on the production of major food grains and the determinants of agriculture gross domestic product.

Objective

To review the trends in major food grain production, before and after the advent of WTO regime in India.

To examine the determinants of agriculture gross domestic product during the pre and post WTO regime based on Cobb Douglas production function.

Methodology

The study is based on secondary data from Indian Agriculture at a Glance 2016 and Hand book on Indian Statistics published by reserve bank of India. The data is collected for the period of 40 years from 1975-76 to 2014-15. The trend in area and production of major food grains (rice, wheat, coarse cereals and pulses) is analysed for pre (1975-1994) and post (1995-2015) WTO regime. The trends in area under cultivation and production of food grains has grouped to two 1975-76 to 1994-95 and after WTO regime from 1995-96 to 2014-15 periods i.e. Cobb Douglas production function is employed using OLS specification to investigate the determinants of agriculture gross domestic product for the above period.

In this study Cobb Douglas production function is use to trace the contribution of individual input in the production function. This methodology enables us to check the presence of Indian agriculture in the phase of production during the different periods.

In the empirical Y study the following model is used

$$Y_i = \beta_1 + CR_{2i}^{\beta_2} + IR_{3i}^{\beta_3} + FE_{4i}^{\beta_4} + PE_{5i}^{\beta_5} + PR_{6i}^{\beta_6} + AR_{7i}^{\beta_7} + e + \mu^i \dots\dots\dots 1.$$

Where,

Yi= Agriculture gross domestic product

CR= Institutional credit to agriculture

Crops	1975-76 to 1994-95 (Before WTO regime)	1995-96 to 2014-15 (After WTO regime)
Rice	3.21	1.52
Wheat	4.18	1.91
Coarse cereals	0.33	2.07
Pulses	0.98	1.92
Total food Grain Production	2.70	1.78

IR= Net irrigated land

FE= consumption of fertilizers

PE= Use of pesticides

PR= Support price declared by the government

AR=Net area sown

Analysis

Trends of Major Food Grain Production in India

In the earlier years of economic planning, food availability was the serious problem in India. The total food grain production was hardly 51 million tons in 1950-51, which increased to 121 million tones in 1975-76 and further increased to 252 million tons in 2014-15.

Trends in major food grains production like rice, wheat, coarse cereals and pulses have been analyzed. The Compounded annual growth rate of major food grains for two periods 1975-76 to 1994-95 and 1995-96 to 2014-15 were presented in the table 1.

Table.1 Trends of Major Food Grain Production in India

The rice production has declined from CAGR of 3.21 percent to 1.52 percent during the after reform period. The wheat production too shows a decline from 4.18 percent to 1.91 percent. The coarse cereals and pulses production show an increase in CAGR of 2.07 percent and 1.78 during the after reform period. The overall growth of food grain production in India has declined from 2.10 percent during before reforms period to 1.78 percent in after WTO regime.

Area under Cultivation of Major Food Grain Production in India

Area under cultivation of major food grains like rice, wheat, coarse cereals and pulses have been analyzed. The Compounded annual growth rate of major food grains for two periods 1975-76 to 1994-95 and 1995-96 to 2014-15 were presented in the table 2.

Table.2 Area under Cultivation of Major Food Grain Production in India

Crops	1975-76 to 1994-95 (Before WTO regime)	1995-96 to 2014-15 (Before WTO regime)
Rice	0.45	-0.03
Wheat	0.87	0.95
Coarse cereals	-1.48	-1.09
Pulses	-0.16	0.59
Total Area	-0.17	0.06

The data from the table 1 infers that the CAGR of area under cultivation decline from 0.45 per cent to -0.03 per cent. The area under wheat cultivation has improved little during after reform period from 0.87 percent

to 0.95 percent. The area under coarse cereals cultivation shows a negative CAGR during both before and after WTO period. The pulses production shows an increase in production from 0.16 percent to 0.59 percent during 1995-96 to 2014-15. There is very little improvement in total area under food grain cultivation in India. The growth of 0.06 percent is negligible for growing demand for food grains.

Table.3 Cobb Douglas Function for 1981-82 to 1994-95

Dependent Variable: LOG (Agri GDP)

	Coefficients	Std. Error	t	Sig.
(Constant)	4.002	1.616	2.476	*
LOG(Ins. Cr)	.072	.060	1.195	Ns
LOG(Area Irr)	.166	.452	.367	Ns
LOG(Cons. Fert)	.020	.107	.191	Ns
LOG(Const. Pest)	.145	.076	1.898	Ns
LOG(MSP Paddy)	.290	.181	1.602	Ns
LOG(MPP Wheat)	-.060	.164	-.364	Ns
LOG(Net Area Sown)	1.198	.341	3.514	*
R	R Square	F	Sig.	Durbin-Watson
.997	.994	152.037	**	2.442

Table 3 explores the determinants of agriculture gross domestic product through the Cobb Douglas production function. It reveals the association between inputs and outputs before WTO regime from 1981-82 to 1994-95. The data on some of the variables is not reported before 1981 and hence the study is confined from 1981-82 only. Variables institutional credit, use of pesticide, fertilizers shows positive association with AGDP. Support price for the wheat declared by the government does not act as motivating factor to the farmers for expanding the cultivation of food grain crops in India. The analysis reveals that there is increasing returns to scale.

Table.4 Cobb Douglas Function for 1995-96 to 2014-15

Dependent Variable: LOG (Agri GDP)

	Coefficients(B)	Std. Error	t	Sig.
(Constant)	6.481	1.139	5.691	**
LOG(Ins. Cr)	.094	.030	3.143	**
LOG(Area Irr)	.191	.327	.585	Ns
LOG(Cons. Fert)	-.113	.078	-1.456	Ns
LOG(Const. Pest)	-.003	.043	-.065	Ns

LOG(MSP Paddy)	.053	.074	.724	Ns
LOG(MPP Wheat)	.137	.083	1.653	Ns
LOG(Net Area Sown)	.947	.359	2.641	*
R	R Square	F	Sig.	Durbin-Watson
.996	.992	218.147	**	2.143

Table 4 reveals the association between inputs and outputs after WTO regime from 1995-96 to 2014-15. Variables institutional credit, net area sown, Support price shows positive association with AGDP. Use of pesticide, fertilizers shows negative association with AGDP. Increase in the inputs like pesticide, fertilizers is not much essential whereas the increase in institutional support is much need in the present scenario to improve agriculture GDP. The analysis reveals that there is increasing returns to scale

Conclusion

The growth of food grain production in India shows a positive growth after WTO regime but comparatively less than the before WTO period. Indian agriculture sector witnessed increasing returns to scale before and after WTO regime. Increase in the amount of fertilizer and pesticides no longer contribute to the growth of agriculture GDP. Against the wide spread complaint that government of India has minimized the subsidy support to agriculture under the pressure of WTO, this finding proves that input availability was under strain during post WTO period. Hence there is urgent need to increase the agriculture support to ensure food security.

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