

# IMPACT OF NATIONAL AGRICULTURAL POLICY 2000 ON AGRICULTURAL CAPITAL FORMATION IN INDIA

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*Abstract:* Agriculture remains the pre-dominant occupation in India for vast sections of the population. Over the years, several new challenges have emerged before the sector. With fragmentation of agricultural holdings and depletion of water resources, the adoption of a resource-efficient, ICT based climate-smart agriculture can enhance agricultural productivity and sustainability. Agriculture and allied sectors are critical in terms of employment and livelihoods for the small and marginal farmers, who dominate the agriculture ecosystem in India. To attain the Sustainable Development Goals (SDGs) of ending poverty and bringing in inclusive growth, activities related to agriculture need to be closely integrated with the SDG targets. *Once every government* comes to power promises *that* to make a prosperous future for peasant in particular and the farm sector also. Likewise In 2016, Prime Minister promised to “double farmers’ income” by 2022 through various agricultural programmes and shifting the agricultural policies and amendment of agricultural laws”. In the post-reform period, the decline of public sector capital formation on agriculture and the stagnation of private sector investment may hinder the overall growth of the sector and further it reduce its contribution to GDP. Both theoretical and empirical models suggested that the rate of change of economic growth depends on rate of saving and rate of capital inflow of a country. Consequently capital is one of the drivers of growth. As a result this paper would form a wider point of view of studying the nexus between capital formation in farm sector and agriculture growth in India

**Index Terms - Gross Domestic Product, Gross Capital Formation, Investment, Agricultural Policy, Peasant, Growth rate, Incremental Growth Rate**

## 1. INTRODUCTION

Agriculture remains the pre-dominant occupation in India for vast sections of the population. Over the years, several new challenges have emerged before the sector. With fragmentation of agricultural holdings and depletion of water resources, the adoption of a resource-efficient, ICT based climate-smart agriculture can enhance agricultural productivity and sustainability. Agriculture and allied sectors are critical in terms of employment and livelihoods for the small and marginal farmers, who dominate the agriculture ecosystem in India. To attain the Sustainable Development Goals (SDGs) of ending poverty and bringing in inclusive growth, activities related to agriculture need to be closely integrated with the SDG targets.

## 2. IMPORTANCE OF THE STUDY

Indian agricultural growth is necessary for the stable functioning of our economy. Agriculture production is necessary for stabilising food inflation which helps for marginalized and poor of the country to adjust their real income. The agricultural sector acts as a bulwark in maintaining food security. Today most of the economist fear that food security is under threat. The per capita productivity of agriculture is less than manufacturing sector. Earlier the growth phase of agricultural sector moved from scarcity to surplus. At present it is perceived that it is earlier once again moving from surplus to scarcity.

## 3. STATEMENT OF THE PROBLEM

Agriculture has given an opening for semi-skilled and unskilled labours. Land reforms have not provided more scope for increasing productivity. The monsoon gambling and terms of trade price are prime cause of agony for agricultural sector. Even today surplus workforce in agriculture has affected this sector adversely. Division of land has provided less scope for introducing new and modern technologies. *Once every government* comes to power promises *that* to make a prosperous future for peasant in particular and the farm sector also. Likewise In 2016, Prime Minister promised to “double farmers’ income” by 2022 through various agricultural programmes and shifting the agricultural policies and amendment of agricultural laws”. In the post-reform period, the decline of state capital formation on agriculture and the stagnation of private sector investment may hinder the overall development of the sector and further it reduce its share to GDP. Both theoretical and empirical models suggested that the rate of change of economic growth depends on rate of saving and rate of capital inflow of a country. Accordingly capital is one of the drivers of growth. In 2000 union government of India introduced the National Agricultural Policy 2000 with a core objective of over 4 percent annual growth rate of farm sector by increasing investment. As a result this paper would form a wider point of view of studying the nexus between investment in farm sector and agriculture growth in India.

## 4. OBJECTIVES OF THE STUDY

To study the trend and compound growth rate of Gross Capital Formation in Agriculture and contribution of Agriculture to Gross Domestic Product

To examine the Incremental Capital Output Ratio of Agricultural Sector

To estimate the investment elasticity of agricultural GDP

## 5. METHODOLOGY

A research study in any field is an investigation of the unknowns from the known. Any research study requires an appreciating methodology. The methodology is a systematic method, which depends on the researcher telling the truth about the goings-on in his research, and not what he wished to happen.

### a. DATA SOURCE

The researcher totally depended upon the secondary data for the study. Time series data for the year 1990-91 to 2016-17 was collected from various Issues of Economic Surveys of India, Agricultural Statistics at a Glance.

### b. Period of study

The researcher has collected time series data from 1990-91 to 2016-17. The period of study was further split into two periods (viz) the pre-National Agricultural Policy 2000 period which covers the period from 1990-91 to 1999-00 and the post National Agricultural Policy 2000 period covering the period from 2000-01 to 2016-17. The classification had done on the introduction of National Agricultural Policy 2000. It was a landmark policy change begins by the government of India with an aim of "attains an agricultural output growth rate over 4 percent per annum, based on efficient use of resources, and sought to achieve this growth in a sustainable and equitable manner". Hence, the researcher has preferred to choose twenty nine years for the present research study.

### c. Tools of Analysis

Suitable tools are needed to find the rate of growth, to compare the growth rate, to find incremental capital output ratio and investment elasticity of the farm sector before and after the introduction National Agriculture Policy 2000. The following tools are used

(i) The Time Series Analysis; (ii) The Semi-Log Model;

(iii) Incremental Capital Output Ratio and

$$IOCR = \frac{GCF(Agri)_{t-1}}{GDP(Agri)_t - GDP(Agri)_{t-1}}$$

Where

GCF is Gross Capital Formation; GDP is Gross Domestic Product, "t" is the present year of the analysis, "t-1" is the previous year of the analysis period.

(iv) Elasticity of Investment

The equation for estimating the Investment Elasticity of Growth is

$$\eta_{GCF} = \frac{\Delta GDP(Agri)}{\Delta GCF(Agri)} \times \frac{GCF(Agri)}{GDP(Agri)}$$

Where

$\eta_{GCF}$  is Investment Elasticity of Growth,  $\Delta GDP$  is change in GDP,  $\Delta GCF$  is change in GCF GDP is Gross Domestic Product and, GCF is Gross Capital Formation.

## 6. Analysis on the Contribution of Agriculture Sector to GDP and Gross Capital Formation

Agriculture sector is a vast sector of the economic activity and has a crucial role to play in the India's economic development by providing food and raw materials, employment to a very large proportion of population, capital for its own development and surpluses for national economic development. Any change in the farm sector, positive or negative, would have a multiplier effect on the economic situation of the country. It plays a crucial role in enabling the distribution of economic benefits and hence agricultural growth is essential to the swift economic development of the country. Increasing productivity in agricultural sector is a precondition for economic development and structural change since only then agriculture can generate a surplus and be in a position to fulfill substitution industrialization through favourable terms of trade for manufacturing, easy availability of foreign exchange reserves, low effective protection for agriculture.

### 6.1 Agricultural Share to GDP

**TABLE 1**  
**Regression Results of The Contribution of The Agricultural Sector to GDP During 1990-91 to 2016-17**  
**(Rs in Crores)**

Model	Period	Year	Regressions Co – efficient			R <sup>2</sup>	Compound Growth Rate
			a	B	t		
Linear	Pre-NAP2000 period	1990-91 to 1999-00	131229	33802.15	28.33	99	--
	Post- NAP2000 period	2000-01 to 2016-17	-119605	163094	17.16	94	--
	Whole period	1990-91 to 2016-17	-446274	103054.5	12.19	84	--
Log-linear	Pre-NAP2000 period	1990-91 to 1999-00	11.9	0.11	21.41	98	11.88
	Post- NAP2000 period	2000-01 to 2016-17	12.84	0.12	43.97	99	12.57
	Whole period	1990-91 to 2016-17	11.98	0.10	27.10	96	10.94

Source: Computed by Researcher

Table 1 Explained that the average annual growth rate of the share of agricultural sector towards GDP during the Pre-NAP 2000 period was Rs. 33802.15 crores. In the Post- NAP 2000 period the rate of change was Rs. 163094 crores. This shows that a significant change in the contribution of agricultural sector towards GDP. The growth rate for the whole period was Rs. 103054.5 crores. The whole period was 0.84 which shows that the 84 percent of the variation in the share of agricultural sector towards GDP was explained by the time.

The semi-log model shows the average growth rate of contribution of the agricultural sector towards GDP in India. The compound growth shows that the average growth rate during the pre and post NAP 2000 period were 11.88 and 12.57 percent respectively. The value for the entire period was 10.94 percent.

## 6.2 Gross Capital Formation in Agricultural Sector

TABLE 2

Regression Results of The Contribution of the Agricultural Sector to Capital Formation During 1990-91 to 2016-17

Model	Period	Year	Regressions Co – efficient			R <sup>2</sup>	Compound Growth Rate
			a	B	T		
linear	Pre-NAP2000 period	1990-91 to 1999-00	51652	2246.2	4.8	74	-
	Post- NAP2000 period	2000-01 to 2016-17	27820.27	20360.81	18.73	95	-
	Whole period	1990-91 to 2016-17	-30953.3	13643.35	13.74	87	-
Log -linear	Pre-NAP2000 period	1990-91 to 1999-00	10.86	0.04	4.79	74	3.70
	Post- NAP2000 period	2000-01 to 2016-17	11.25	0.09	23.62	97	10.11
	Whole period	1990-91 to 2016-17	10.57	0.08	27.1	96	8.62

Source: Computed by Researcher

Table 2 explained that the annual average growth rate of the share of agricultural sector towards capital formation during the pre-NAP 2000 period was Rs. 2246.2 crores. In the post-NAP 2000 period the rate of change was Rs. 20360 crores. This shows that a greater change in the contribution of the agricultural sector towards capital formation. The growth rate for the whole period was Rs. 13643.35 crores. The R<sup>2</sup> value of the whole period is 0.87 which shows that the 87 percent of the change in the variation in the growth of the contribution of agricultural sector towards investment is explained by the time.

The semi-log model shows the average growth rate of contribution of agricultural sector towards investment in India from 1990-91 to 2016-17. The compound growth rate shows that the average growth rate during the pre and post reform period were around 3.7 percent and 10.11 percent respectively. The corresponding value for the complete study value was 8.62 percent.

## 7. Incremental Capital Output Ratio and Investment Elasticity in India during

Table - 3

Agriculture's GDP, Gross Capital Formation, Incremental Capital Output Ratio and Investment Elasticity in India during 1991-92 to 2019-20

(Current Price Based on 2011-12 Series)

(Rs in Crores)

Year	Share of Agriculture to GDP	Percentage share of Agriculture to GDP	Gross Capital Formation in Agriculture	Percentage share of Agriculture's Gross Capital Formation GDP	Incremental Capital Output Ratio	Investment Elasticity of Agriculture's GDP
1990-91	174906	29.39	50646	8.51	2.38	-
1994-95	294368	27.13	67859	6.23	1.82	1.26
1999-00	453321	23.36	69648	3.59	1.93	-0.08
2004-05	639988	19.20	120380	3.61	1.60	0.93
2009-10	1299884	18.50	184500	2.63	0.91	-55.70
2016-17	2227533	17.70	298555	2.37	1.30	-0.54

Source: Various Issues of Economic Survey, Ministry of Finance, New Delhi

Various Issues of Agricultural Statistics at a Glance, Ministry of Agriculture &amp; Farmers Welfare, New Delhi

The table 3 revealed that The percentage contribution of agriculture sector's GDP to the total GDP was 29.39 percent in 1990-91 after that, its share to the total GDP was on the declining path and the contribution share of agriculture sector to the total GDP was 17.7 percent in 2016-17. Total GCF in agriculture has absolutely increased from Rs.50646 crores in 1990-91 to Rs.298555/- in 2016-17 but the percentage share to GDP has declined from 8.51 percent in 1990-91 to 3.61 percent in 2004-05 then further came down to 2.37 percent in 2016-17. "The falling public investment in agriculture during the study period was mainly because of a large proportion of the resource flows to the agriculture sector going in to current expenditure on subsidies for fertilizers, irrigation, electricity, credit and other agricultural inputs, rather than investment. The rising level of subsidies in agriculture and diversion of funds from irrigation to anti-poverty programmes were the real hindrances in the growth of public capital formation". The private invest almost stagnant because falling profitability, credit crunch and Problems of crop insurance in agriculture are keeping investors away from agriculture. Even some time these are barriers to enter in agricultural activities.

The incremental capital output ratio (ICOR) explains the relationship between the level of investment made in the economy and the consequent increase in GDP. Minimum ICOR reveals that the investment yields a good return and in India the ICOR 1.6, 0.91, and 1.30 were least in the 2004-05, 2009-10 and 2016-17 respectively. This shows that the marginal efficiency of capital in India's agricultural sector was good in the periods. In 1990-91 the IOCR was 2.38; in 1999-00 which was 1.93 then in 2004-05 it was 1.60 also. These rates indicated that higher the ICOR, lower is the productivity- it means more incremental units of capital are needed to produce one incremental unit of output. Higher ICOR implies that higher cost of production and lower profitability as well as marginal efficiency of capital.

Elasticity concept has been utilized in this study to estimate the responsiveness of agriculture GDP for the change in GCF in agriculture. Investment elasticity of GDP in agriculture was higher (1.26) in 1994-95 due to introduction of economic reform in 1991 and 0.93 in 2004-05 that may be the effect of implementation New Agricultural Policy 2000. It was negative in 1999-00 (-0.08), 2009-10 (-55.7) and 2016-17 (-0.54). This shows out of three periods investment elasticity of GDP in the agriculture sector was not elastic. This reveals two aspects of growth in Indian economy after the reforms, one is, there was high growth in

the overall GDP and second is, in the agriculture sector the growth was inadequate. Instability in government expenditure on agriculture, may affect the development of agricultural sector. To attain sustainable growth in agriculture, provision of adequate public outlay on a predictable basis is an important stimulus to agricultural output growth. Public sector investment on agriculture induces the farmer to increase their farm investment. Thus, without adequate public investment, agriculture cannot make substantial contribution to the economic development of the country

### 8. Findings

1. The linear model of agriculture contribution to GDP and gross capital formation in agriculture sector showed that the average rate of change in absolute term is higher in Post-NAP 2000 period than pre-NAP 2000 and whole period
2. The semi-log model of agriculture contribution to GDP and gross capital formation in agriculture sector indicated that the average growth over the period of time in percentage had nearly 12 percent
3. The absolute amount of agriculture contribution to GDP and gross capital formation in agriculture sector had increased but the percentage share to GDP had fall down over the study period.
4. Incremental Capital Output model had clearly pointed out that the change in agricultural contribution to GDP were lesser than the gross capital formation of agricultural sector of those periods.
5. Elasticity model manifested that investment elasticity of GDP in the agriculture sector was not elastic and it were elastic in some period but those elastic were poor.

### 9. Suggestions

There is need to significantly step up investment in agriculture, both by the private and public sectors to ensure sustained target growth of 4 per cent per annum and Government give more incentives on to encourage cooperative farming systems

Both Union government and State government have to formulate new agricultural policy after getting input from farmers of various states.

Agricultural credit facility should be extended and it favours of marginal and small farmers of the country and convert the minimum support price policy into, Maximum support price

MGNREGA programme should effectively used to increase the rural infrastructure

### 10. Conclusion

The above analysis has thrown light that there is a small improvement in the performance of agriculture sector in GDP, and gross capital formation in agriculture sector. But however this performance is not satisfactory considering the market size for agriculture. The investment and capital formation is very low. Managing the ground water level is another serious concern to be addressed. The overall development of Indian economy is not inclusive in nature. The agriculture and allied sector should be given more priority since most of the rural masses depends their livelihood on this sector at the same time excess labours have to withdraw from agriculture. The investment primary sector should be increased, so that the whole Indian economy will be vibrant.

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