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Analysis of Agriculture Production in India

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Abstract:
This paper an attempts to explore to an Analysis of Agriculture Production in India during the period from 1990-91 to 2024-25. Agriculture is backbone of Indian Economy. India has vast population. Agriculture is seen as most significant pillar economic stability. Agriculture is having prime sector of India and most important source of employment generation. The development of industrial sector and development of service sector broadly lies on agriculture sector. No plan or scheme can be designed unless taken into consideration of agriculture. To thrust Indian economy and to be make super power to country, the robust development of agriculture is essential. The significance of agriculture of India arose also from fact that the development in agriculture is most important condition for the development of the national economy (Datt Gaurav and Mahajan Ashwani, 2016, p.534)[1] To accomplish the present paper, secondary data was collected from different sources books, articles internet and newspapers etc. Besides, the results and interpretation made by Time Series Analysis with Least Square Method and Simple Linear Regression Model were performed throughout MS Excel. Agriculture Production in India is showing progressive trend. The production horticulture and vegetables have been increasing rapidly during the past twenty five years. It has reflected to promote export of agriculture products from India. Indian agriculture is driven by technology and balanced fertilizers. India accounts for 42 percent labour force in agriculture

Keywords: Place of Agricultural in Indian Economy, Trends of Agriculture Production in India and Time Series Analysis Least Square Method, Linear Regression Model.

Introduction:

Agriculture plays paramount role in India Economy. Agriculture in India is not only business it is lifestyle of people of India. Agriculture is backbone of Indian Economy. India has vast population. Agriculture is seen as most significant pillar economic stability. Agriculture is having prime sector of India and most important source of employment generation. The development of industrial sector and development of service sector broadly lies on agriculture sector. No plan or scheme can be designed unless taken into consideration of agriculture. To thrust Indian economy and to be make super power to country, the robust development of agriculture is essential. The significance of agriculture of India arose also from fact that the development in agriculture is most important condition for the development of the national economy (Datt Gaurav and Mahajan Ashwani, 2016, p.534)[1] Agriculture in India has been witnessing serious bottlenecks for last 25 years. Indian agriculture has been increasing production of food grains for every year. India consists the top producers of several crops such as wheat, rice, pulses, sugarcane and cotton. It is the also highest producer of milk and is second highest producer of fruits and vegetables (Deshpande Tanvi , 2017).[2]

Objectives of the Study:

1. To Explore the Place of Agricultural in Indian Economy.
2. To Study the Trends of Agriculture Production in India.

Methodology of the Study:

The paper is descriptive and analytical in nature. The present paper is completely based on secondary data. The required and necessary data concerned with Analysis of Agriculture Production in India have been taken from various sources like books, articles internet and newspapers etc.

Interpretation of Data:

The present paper is analyzed and interpreted accompanied by using some statistical tools like Least Square Method of Time Series Analysis It is used to fit a straight line trend. To analyze the trend of Agriculture Production in India during period from 1990-91 to 2024 -25 following equation has been taken into account and Simple Linear Regression was put to compute Trend Analysis and "Line of Best Fit."

Yc= a + bX

In Formula's

Yc = Estimated Value of the Trend

'a' = Constant Intercept

'b' = Constant represent the Slope of Line

X = Time

In order to determine the values of constant 'a' and 'b' the following two normal equation solved

$\sum Y = Na + b \sum X$ ----------(1)

$\sum XY = a \sum X + b \sum X2$ ---------- (2)

Limitations of the Study:

The present paper is made on with Analysis of Agriculture Production in India

Provided that, the said paper is designed merely taken into consideration of Agriculture Production in India. .Hence the results and discussion to be limited with geographical boundary of India. Similarly, the paper is analyzed throughout Time Series Analysis, Least Square Method and Simple Linear Regression Model. Therefore, Results and interpretation is based on only said methodology. The study has taken into consideration period from 1990-91 to 2024-25. It is therefore, the present paper limited to be said concern.

Results and Discussion:

Place of Agriculture in Indian Economy:

The place of agriculture in Indian economy may be elaborated by number of issues, which consist of following issues.

1. Contribution in National Income:

In order to importance of any sector in particular economy, It important to know the contribution of that sector in national income of the country, Due to having an agrian economy, India had witnessed highest share of agriculture in national income. Agriculture accounted for 56.5 percent share in national income. It has has reflected that non agriculture sector development was slow and had no larger space to

its. Development. However, the share of agriculture has been declining since planning era. Indian agriculture has 18.2 percent in country's GDP for 2023-24. (PIB, 2024)[3]

2. Employment Generation:

Indian agriculture is biggest source of employment generation. Indian agriculture sector provides livelihood and employment support to 42.3 percent population of the country (PIB, 2024). [4] The share of agriculture in employment generation has been always highest and larger. No other any sector of country has capacity to provide employment large segment of country's population. This role of agriculture has been received important place in overall development of country.

3. Contribution of International Trade:

Agriculture has contributed a sizeable part of exports and in important segment of import of country. The export from agriculture products have been quite large and rising through year by year. Indian agriculture export important items like tea, coffee, tobacco, wood timber etc. The export earning from agriculture sector is useful to enabling the country to buy development goods and consumer goods. Imports from agriculture is no less important in the country. Agriculture imports include, fertilizers, textile fibers vegetables, oils, pulses and implements also. (Agrawal A. N, 1986)[5]

4. Contribution to Framing Indian Budget:

The budget of bot Centre and state have been considerably influenced by land and tax and in one hand and other its provision of development expenditure. The more important budgetary operation having relevance to agriculture is the spectacular expenditure that is being incurred on it for several purposes including large part of development of agriculture in India. (Agrawal A. N, 1986)[6]

5. Agriculture and Industry:

Agriculture and Industrial are carrying out it's journey by together. In India. agriculture provides raw materials to many industries like cotton for textile industry, sugarcane for sugar industry and tea for tea industry. Most of industries in India are directly depend on agricultural and its allied activities. Agriculture and Industrial sector have strong linkages with each this linkages consisted demand saving and investment linkages. (Dhingra I. C., 1997)[7]

6. Contribution to Capital Formation:

Capital formation is accumulation physical assets that enhance productive capacity of agriculture sector. Capital formation of country depend upon mainly major three factor saving creation, collection of saving and investment. Developing Country like India , agriculture contributes higher share in capital formation. In Agriculture Sector. Capital formation is made irrigation facilities, research extensive activities and Rural Infrastructure. (Agriculture Institute, 2024)[8]

7. Key Role in Economic Planning:

Indian agriculture holds important role in economic planning. If agriculture develop very well, it will lead industrial development. The aim of achieving poverty alleviation is possible through agricultural development. Agriculture leads to rural development in country. If economic planning to be successful, agriculture development is necessary in country.

8. Livestock Development:

Livestock plays vital role in Indian Economy. Nearly 20.5 million people depend upon livestock their livelihood. Livestock provides livelihood to two-third of rural community. It also provides employment about 8.8 percent population of India. India has vast livestock enrichment that consist Cattle, Buffaloes, Ship, Goats and Others. Poultry and Dairy development are directly associated with Livestock of the country. (Tamizhkumaranj, 2025).[9]

9. Strengthening Food Security:

Agriculture is the main foundation of the global level food system. It is main component to producing most of the food consumed by human (Islam Shahidul, 2025)10 it includes wheat rice, maize. Due to green revolution, Agricultural production has been increase rapidly in India. It was time that India had import (P. L. 480 Scheme Wheat) from America . But today, the situation has changed to in respect of food production. Now, India ensured fully food security. It is credit of all agriculture.

10. Stability in General Price Level:

Agriculture in India witnesses higher level fluctuation in price. In India. majority population spend their higher share of income to purchase food grain food stuff items. But, The larger level fluctuation in price lead to fluctuation in food grain and other essential items. Insufficient production in agriculture lead to increase general price level and inflation. It is therefore, Indian agriculture has played most important role in general price stability of the country.

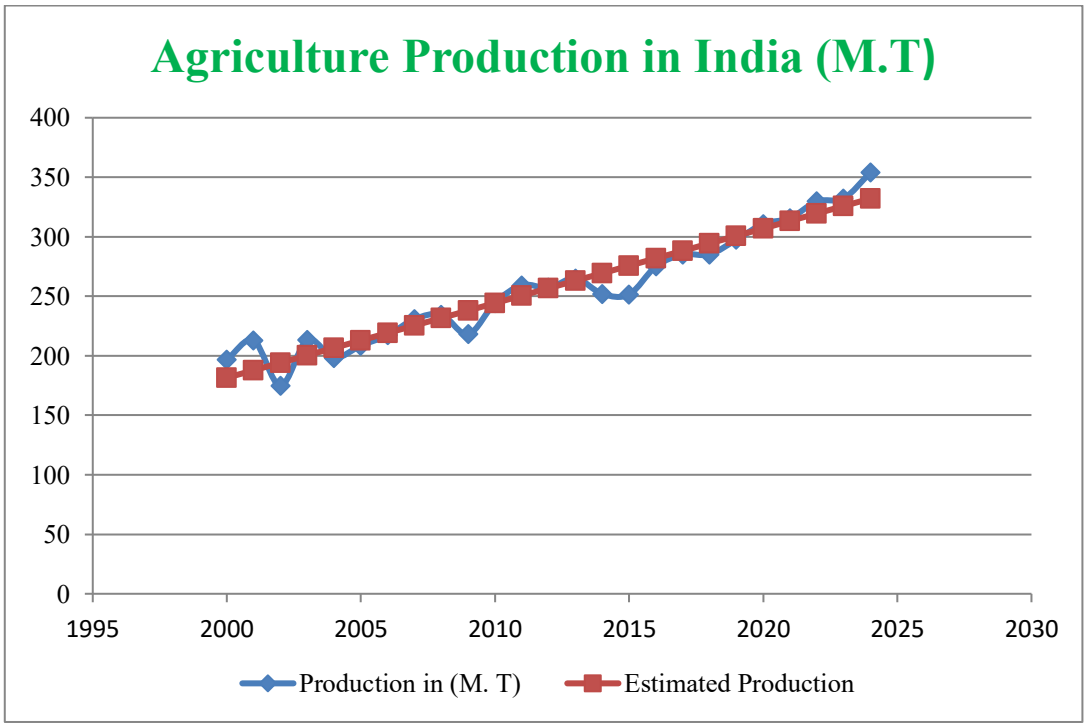
Table 1.1 Agriculture Production in India (Million Tonnes)

Sr. No	Year (X)	Production (M. T.) (Y)	Estimated Production
1	2000-01	196.81	181.52
2	2001-02	212.85	187.79
3	2002-03	174.77	194.07
4	2003-04	213.19	200.34
5	2004-05	198.36	206.61
6	2005-06	208.60	212.88
7	2006-07	217.28	219.16
8	2007-08	230.78	225.43
9	2008-09	234.47	231.70
10	2009-10	218.09	237.98
11	2010-11	244.48	244.25
12	2011-12	259.29	250.52
13	2012-13	257.12	256.79
14	2013-14	265.05	263.07
15	2014-15	252.03	269.34
16	2015-16	251.54	275.61
17	2016-17	275.11	281.89
18	2017-18	285.01	288.16
19	2018-19	285.21	294.43
20	2019-20	297.50	300.70
21	2020-21	310.74	306.98
22	2021-22	315.62	313.25
23	2022-23	329.69	319.52
24	2023-24	332.30	325.79
25	2024-25	353.96	332.07

Source: Agricultural Statistics at a Glance 2024 and Out-Put Generated by M.S. Excel

The above tables reveled that agriculture production of India (M.T.) and estimated agricultural production in India during the given period.. The actual agriculture production of India has been continuously increased over the past 25 years. It shows increasing trend. In 2000-01, about 196.81 M.T. agriculture production was reported, which alarmingly surged to 353.96 (M.T) in 2024-25. This growth in agricultural production is marked by nearly double in comparison with 2000-01 year. Similarly, the estimated agriculture production of India has been also continuously increased from 181.52 (M.T) to 332 07 (M.T) million tonnes during the time taken into consideration. . It shows increasing trend. This growth in agricultural production is marked by considerably e in comparison with 2000-01 year. The said massive growth in agriculture production of India witnessed on account of government has been drastic initiatives to increase agriculture investment enabling the rural infrastructure and institutional credit supply for agriculture sector.

Graph1.1
Agriculture Production in India (M. T) 2000-01 to 2024-25



The above graph indicates that agriculture production of India (M.T.) observed and estimated agricultural production in India during the given period from 2000-01 to 2024-25. In 2000-01, the estimated production accounts 181.52 (M.T) million tonnes, which is lower than actual agriculture production in India during the given period. The same trend witnessed in 2001-02, while estimated production is higher (194.07) million tonnes over actual production in the year 2002-03. Besides, The years from 2018-19 to 2024-25 indicating estimated agriculture production in India is lower than actual agriculture production in India during the respective period. It accounts for 300.70, 306.98, 313.25, 319.52, 325.79 and 332.07 million tonnes respectively. The said graph shows progressive trend of agriculture based on line of best fitting during the given period and forecasted further year 2025-26 to 2009-30 agriculture production in India which constitutes 338.34, 344.61, 350.89, 350.89 357.16, 363.43 and 369.70 million tonnes.

Regression Analysis Summary Out-Put:

Regression Statistics	
Multiple R	0.965889285
R Square	0.932942111
Adjusted R Square	0.930026551
Standard Error	12.64351577
Observations	25

ANOVA								
	df	***SS***	***MS***	***F***	***Significance F***			
Regression	1	51152.6767	51152.68	319.9872359	5.42454E-15			
Residual	23	3676.745296	159.8585					
Total	24	54829.422						
	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***	***Lower 95.0%***	***Upper 95.0%***
Intercept	-12364.11055	705.5486159	-17.5241	8.43878E-15	-13823.64907	-10904.57204	-13823.6	-10904.6
Year	6.272815385	0.350668034	17.88819	5.42454E-15	5.547403287	6.998227482	5.547403	6.998227

The above tables reveals linear regression statistics out summary. In the above table Multiple R indicates correlation between observed value and predicted value. Here 0.9658 indicating a strong positive correlation. The R^2 of the linear function is 0.932 indicating the 93.2 percent of the variation in Agriculture Production in India explained by linear model. In above table F statistics indicates that whether model is statistically significant or not the p value F test. A value of 5.4245 indicating that model is not statistically significant. The value of Y dependent variable when the independent variable is zero. Time is good indicator of Agriculture Production (M.T) Million Tonnes in india The sign of the co-efficient in the linear model is positive, indicating that there is positive relationship between Agriculture Production (M.T) Million Tonnes in india and Time. The magnitude of the co-efficient is 12364.11 indicating the how much Agriculture Production (M.T) Million Tonnes in india will increase one year to another year. The X variable indicates slope or rate of change, indicating that when every 1 unit in X the dependent variable increased by 6.2728. Similarly, the 't' stat and 'P' value indicates coefficients are significant or not significant. In the said model 8.4387 which is higher than < 0.05. It means co-efficient is not significant. The said model 'P' value > 0.05 is greater than < 0.05. It is therefore the predictor variable and out come variable is not statistically significant at the 95 percent confidence level.

Findings of the Study:

1. The regression equation is determined as Y=12364.11 + 6.27* X
2. The X variable co-efficient (6.27) suggested that as X increases by 1 unit, Y increases by approximately 6.27 units.
3. The actual agriculture production of India has been continuously increased over the past 25 years. It shows increasing trend. In 2000-01, about 196.81 M.T. agriculture production was reported, which alarmingly surged to 353.96 (M.T) in 2024-25.
4. This growth in agricultural production is marked by nearly double in comparison with 2000-01 year.
5. The estimated agriculture production of India has been also continuously increased from 181.52 (M.T) to 332 07 (M.T) million tonnes during the time taken into consideration. . It shows increasing trend. This growth in agricultural production is marked by considerably e in comparison with 2000-01 year
6. The study finds out the R indicates correlation between observed value and predicted value. Here 0.9658 indicating a strong positive correlation in respect Agriculture production of India and Time Period taken into consideration.
7. The study reveals that the R^2 of the linear function is 0.932 indicating the 93.2 percent of the variation in Agriculture Production in India explained by linear model.
8. The study focused on table F statistics indicates that whether model is statistically significant or not the p value F test. A value of 5.4245 indicating that model is not statistically significant.
9. Similarly, the study reveals that sign of the co-efficient in the linear model is positive, indicating that there is positive relationship between Agriculture Production (M.T) Million Tonnes in india and Time. The magnitude of the co- efficient is 12364.11 indicating the how much Agriculture Production (M.T)
10. Million Tonnes in India will increase one year to another year.
    The study found that the said regressions model 'P' value > 0.05 is greater than < 0.05. It is therefore the predictor variable and out come variable is not statistically significant at the 95 percent confidence level.

Conclusion:

Agriculture Production in India is showing progressive trend. The production horticulture and vegetables have been increasing rapidly during the past twenty five years. It has reflected to promote export of agriculture products from India. Indian agriculture is driven by technology and balanced fertilizers. India accounts for 42 percent labour force in agriculture. The share of agriculture in Gross Domestic Product (GDPI is declining over the last twenty five years. It is sign paradigm shift from agriculture economy to Non agriculture economy. However, India has still largest level population of agriculture background. Indian agriculture is ensuring significant growth despite having climate change and productivity gap. If the pace of agriculture production to be remains continue, Indian agriculture will very soon achieve robust and sustainability in overall growth of agriculture sector.

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