

Agricultural Development in Odisha in Pre and Post Policy Implementation Period

Dr. Jyotirmayee Mohanty¹
Prof. Sudhakar Patra²

¹ Research Scholar in Economics, Berhampur University, Odisha, jmohanty452@gmail.com

² Professor of Economics, Berhampur University, Odisha, sudhakarpatra65@gmail.com

Abstract:

The objective of the paper is to analyse the policy issues and impact of agricultural development in Odisha. The study is based on secondary data from 1990-91 to 2018-19 collected from Economic survey reports, Department Of Agriculture and Farmers' Empowerment, Planning and Convergence Department of the State of Odisha, Directorate of Economics and Statistics etc. A comparative analysis has been done using ANOVA to find out how the agriculture productivity before the introduction of State's agriculture policy in 2008 and revision of the same policy in 2013. Agricultural development is vital for the economy of Odisha as 49% of the workforce are engaged in this sector. According to the World Bank report 2009 agricultural growth can bring quick reduction in poverty. As 91% of poverty is found in rural areas in our State, it is imperative to grow agriculturally faster. Agriculture is a State issue and its success depend on the policy of the particular State. The first ever National Agricultural Policy in India was announced in 2000. Government of Odisha also adopted two such separate policies in 2008 and 2013. The development in any sector depends on the coordination between its policy and planning. In this study an effort is made to find out the role of policy in the agricultural development in Odisha. There has been some fluctuations found in the growth rate of agriculture in different years due to low base and vagaries of monsoon. Cropping pattern is highly skewed towards rice and crop diversification is low. The share of agriculture in State's GDP is declining over the years. It is a matter of great concern. A comparative ANOVA test is carried out to find out how the agricultural productivity remained before the introduction of State's agri policy in 2008 and revision of the same in 2013. The result of the post hoc analysis reveals that agricultural development has slowed down in 2013 compared to the period in 2008. But there has been an overall development observed after the inception of State agricultural policy.

Keywords: Agricultural Policy, Comparative Analysis, Crop Diversification, Gross Cropped Area, Economic Reform

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I. Introduction:

Odisha is among the few states that, since March 2000, has witnessed a long period of political stability and economic policy continuity. Odisha is also endowed with plenty of natural resources, particularly minerals, forests, and groundwater. Given all this, one of India's wealthier states should have been Odisha. But it is not ironically so. Its per capita income is the fifth-lowest among Indian nations, and poverty the sixth-highest among them. State policies will contribute to a rise in the gap between states' growth rates. Agriculture is a state issue, and agricultural success depends primarily on the policy of the particular state. Srivastava (1993) pointed out that the complexities of transition in regional agricultural growth inequalities will depend on the essence of regional economic progress gains distribution. State Government's Agriculture policy can take the form of land reform implementation, public investment in irrigation methods and the deployment of new technologies, i.e. in Indian case, New Agricultural Strategy leading to green revolution in agriculture.

In promoting agricultural growth in the region, the State has played a crucial role. The country embarked on a projected socio-economic development process, and hence the country warranted the highest attention. The general contours of these programmes related to the development of basic infrastructure including the improvement of agricultural production, Irrigation provision, land improvement and development, modernization of the production process, the establishment of an institutional structure to reach the rural community systematically, like State Extension Program and Urban Building Programs, other procurement of products and services by institutions, etc. The major policy thrust in the pre-green revolution era from 1950-51 to 1965-66 was an agrarian reform as well as the modernisation of agriculture by large-scale investment in

irrigation, power and other infrastructure such as; Credit institutions, regulated markets, roads and extension and research and development.

Objectives and Methodology of the Study

The principal objectives of the study are as follows.

1. To identify the policy issues for development of agriculture in different plan periods of Odisha,
2. To examine the role of policy in the development process of an economy in general and the agricultural sector in particular.

The study has used secondary time-series data extracted from various published sources of the Government of Odisha such as Economic survey reports, Department Of Agriculture and Farmers' Empowerment, Planning and Convergence Department of the State of Odisha, Directorate of Economics and Statistics etc. The study covers a period of nearly three decades from 1990-91 to 2018-19 (29 years). For this, a comparative analysis has been done using ANOVA to find out how the agriculture productivity before the introduction of State's agriculture policy in 2008 and revision of the same policy in 2013. The available secondary data has been divided in to three parts. The first part constitutes the period from 2001 to 2007 when there was no such agriculture policy. The second part includes the agriculture production during 2008 to 2013 and the third part constitutes the post introduction phase of the OSAP 2013 containing data from 2013 to 2019.

Statement of the Problem and Need of the Study

In our country India, many efforts through various plans and programs have been made to raise agricultural productivity so as to contribute towards its economic development, without the support of a concrete agricultural policy ever since independence of the nation. But the first ever National Agricultural Policy was announced on 28th July 2000. Since the announcement of the NAP, however little concrete action has been taken at the central and State level to implement the proposed policy measures. Since economic reforms began in 1991, India has transformed itself on the global stage. In general, its economy has been opening and growing steadily, leading to higher incomes and greater and more diversified demand. However, slow growth in the agricultural sector remains a cause of concern. The share of agricultural sector in the State's Gross Domestic Product was more than 70 per cent in the early 1950s, which has come down to 17.49 per cent in 2012-13. The share of the dependents on agriculture for their livelihood was more than 80 per cent during 1950s, which again has been reduced to about 60 per cent in 2012-13. Although such a large percentage of population depend on agricultural sector, the contribution of this sector to Gross State Domestic Product is less than 20 per cent. It is a matter of great concern. It calls for the study to examine and to find out the causes responsible for the slow progress of agriculture in the state of Odisha.

II. Literature Review

Some relevant and key literature are briefly reviewed below. **Arora (2013)** reviewed the evolution of agricultural policies of the Nation and the major challenges faced by the policymakers in a presidential address on "Agricultural Policies in India: Retrospect and Prospect" in annual conference of Agricultural Economics Research Association, later on published in "Agricultural Economics Research Review".

Kumar M. (2019) The challenges before the Govt. of India regarding agriculture is the increases in its productivity with limited irrigation opportunities. Of course, Govt. of India has started Soil Health Card Scheme for improving soil fertility, Pradhan Mantri Krishi Sinchai Yojana for improving level of irrigation, Paramparagat Krishi Vikas Yojana for supporting organic farming, Pradhan Mantri Fasal Bima Yojana for mitigation of risk of crop loss, creation of unified National Agriculture Market to give a boost to income of farmers etc. It has also the challenge of doubling farmers income by 2022.

Chand (2005) in his paper titled Exploring Possibilities of Achieving Four Percent Growth Rate in Indian Agriculture estimated production functions of all the States using crop output at 1993-94 prices. Production function was estimated transforming raw data into log linear form. Prices, fertilisers, rainfall, irrigation and some other variables were taken as dependent variables. Only statistically significant coefficients were used for the analysis. But there arose complicity of multi collinearity among dependent variables. That's why final estimation was made using fertiliser and irrigation elasticities. Among all the States highest decline in irrigation was found in Odisha. The rate of decline was more than 2 percent per annum. In Odisha output elasticity with respect to fertiliser was 0.13 and that of irrigation was 0.47. In order to secure 4 percent growth rate fertiliser consumption and irrigation potential should have increased by 4.35 percent and 1.95 percent respectively.

Hypotheses of the Study:

Important hypotheses formulated in study are stated below.

H_{01} : There is no significant impact of agriculture policies in the development of irrigation potential in the State.

- H₀₂: The State's agriculture policies have no significant impact on total seed distribution among the farmers.
 H₀₃: The State's agriculture policies have no significant impact on Farm Mechanization.
 H₀₄: The State's agriculture policies have no significant impact on the development of Net sown area.
 H₀₅: The State's agriculture policies have no significant impact on the development of gross cropped area.
 H₀₆: The State's agriculture policies have no significant impact on total fertilizer consumption for agriculture.
 H₀₇: There is no significant impact of agriculture policies in improving the contribution of Agriculture to the State's gross domestic product.
 H₀₈: There is no significant impact of agriculture policies in increasing the total agriculture production in the State.
 H₀₉: The State's agriculture policies have no significant impact on the agriculture yield capacity.

Impact of Agricultural Policy of Odisha

There is a significant development happened after the introduction of the state agricultural policy first in 2008 and a revised policy in 2013. ANOVA was used for this analysis.

Table -1: Analysis of the variance (ANOVA) exploring the mean difference of agriculture development during the policy implementation periods						
		Sum of Squares	df	Mean Square	F	Sig.
Total Irrigation Potential	Between Groups	0.325	2	0.163	28.448	.000
	Within Groups	0.086	15	0.006		
	Total	0.411	17			
Total Seed Distribution	Between Groups	0.490	2	0.245	21.769	.000
	Within Groups	0.169	15	0.011		
	Total	0.658	17			
Farm Mechanisation	Between Groups	3.286	2	1.643	52.429	.000
	Within Groups	0.470	15	0.031		
	Total	3.756	17			
Net Area Sown	Between Groups	0.002	2	0.001	10.815	.001
	Within Groups	0.001	15	0.000		
	Total	0.003	17			
Gross Cropped Area	Between Groups	0.001	2	0.000	0.854	.445
	Within Groups	0.005	15	0.000		
	Total	0.005	17			
Fertilizer Consumption	Between Groups	0.099	2	0.050	25.665	.000
	Within Groups	0.029	15	0.002		
	Total	0.128	17			
States Agri-Gross Domestic Product	Between Groups	0.942	2	0.471	52.719	.000
	Within Groups	0.134	15	0.009		
	Total	1.077	17			
Total Agriculture Production (000mt /bales)	Between Groups	0.035	2	0.018	7.382	.006
	Within Groups	0.036	15	0.002		
	Total	0.071	17			
Agricultural Yield (in Kg/Ha)	Between Groups	0.041	2	0.021	41.198	.000
	Within Groups	0.007	15	0.000		
	Total	0.049	17			

Source: Researcher's own interpretation using secondary data

The Table-1 given above presents the ANOVA test results. The test is conducted to examine whether there is a significant development happened after the introduction of the state agricultural policy first in 2008 and a revised policy in 2013. It basically compares the three stages such as a period when there is no state-owned agricultural policy i.e. post 2008, and the period after implementation of the state agriculture policy in 2008 and the third period post 2013. These three periods are compared for the development of different agricultural and allied sectors like; Total Irrigation Potential, Total Seed Distribution, Farm Mechanisation, Net Area Sown, Gross Cropped Area, Fertilizer Consumption, State's Agri-Gross Domestic Product, Total Agriculture Production (000mt /bales), Agricultural Yield (in Kg/Ha). Before conducting the ANOVA test, the secondary data has been transferred to its log value so that it is free from the seasonal effect on normality, skewness which may affect the test results.

The analysis of the above table indicates that all the variables except the gross cropped area are showing a significant p-value i.e. less than 0.01. Whereas in case of Gross cropped area the p-value is 0.445 which is greater than the standard p-value leading to the acceptance of the null hypothesis H₀₅ at 1% error level and can be inferred that there is no significant development in the gross cropped area in the state due to OSAP. This indicates that the development of gross cropping area has shown no significant improvement during the plan periods. However, in case of net sown area, it is significant at p-value < 0.01. It can be inferred that the null hypothesis H₀₄ is rejected. Even though there is a significant increase in the new sown area in the State, but the gross cropped area has not increased over the policy period.

However, the total irrigation potential has increased significantly during the scheme periods with a p-value less than 0.01 which led to the rejection of the null hypothesis H_{01} and can be concluded that there is a significant increase in the total irrigation potential in the state of Odisha after the introduction of the OSAP. Similarly, Total Seed Distribution and Farm Mechanisation is also showing a significant p-value leading to the rejection of the corresponding null hypotheses H_{02} and H_{03} . As such, the fertilizer consumption in the State has also increased significantly leading to the rejection of the null hypothesis H_{06} . Finally, the agricultural output in the State measured using three variables i.e. the agricultural GDP, Agriculture production in thousand metric-tons, and agriculture yield measured in terms of kgs per hectare are showing a significant p-value thus rejecting the null hypothesis H_{07} , H_{08} , H_{09} .

The table-2 shows the post hoc analysis for the irrigation potential in the three study periods. It can be observed that the agriculture production during 2008-12 is significantly higher compared to the period 2001-07 with a significant value less than 0.01. However, no significant increase has been observed in the period 2013-19 compared to the period 2008-12 as it shows a p-value 0.069 which is greater than the standard value of alpha (α) 0.05. It can be inferred that the revision of the OSAP in 2013 has not able to develop the irrigation potential significantly in the State.

Table -2: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) for Irrigation Potential of Odisha

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Total Irrigation Potential	No Agri Policy 2001-07	Agri Policy 2008-12	-0.217*	0.044	0.000	-0.312	-0.123
		Agri Policy 2013-19	-0.307*	0.042	0.000	-0.397	-0.217
	Agri Policy 2008-12	No Agri Policy 2001-07	0.217*	0.044	0.000	0.123	0.312
		Agri Policy 2013-19	-0.090	0.046	0.069	-0.187	0.008
	Agri Policy 2013-19	No Agri Policy 2001-07	0.307*	0.042	0.000	0.217	0.397
		Agri Policy 2008-12	0.090	0.046	0.069	-0.008	0.187

*. The mean difference is significant at the 0.05 level.

The table-3 gives the post-hoc analysis result done on the total seed distribution in the State. The total seed distribution includes both paddy and non-paddy seeds. It can be observed from the table that the distribution of seeds to the farmers has significantly increased after the introduction of the State's agriculture policy in 2008. In contrary, the seed distribution has declined significantly after the introduction of the OSAP in 2013 which is indicated in a mean difference of 0.162. However, this difference is not significant at p-value of 0.01 level but at p-value 0.05 level it is significant leading to the conclusion that the State has a negative impact on the seed distribution during post introduction of OSAP 2013.

Table -3: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) For total distribution of Seed (paddy and non-paddy)

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Total Seed Distribution	No Agri Policy 2001-07	Agri Policy 2008-12	-0.401*	0.062	0.000	-0.533	-0.269
		Agri Policy 2013-19	-0.239*	0.059	0.001	-0.365	-0.113
	Agri Policy 2008-12	No Agri Policy 2001-07	0.401*	0.062	0.000	0.269	0.533
		Agri Policy 2013-19	0.162*	0.064	0.023	0.025	0.299
	Agri Policy 2013-19	No Agri Policy 2001-07	0.239*	0.059	0.001	0.113	0.365

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		Agri Policy 2008-12	-0.162*	0.064	0.023	-0.299	-0.025
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*. *The mean difference is significant at the 0.05 level.*

The table-4 presents the post-hoc analysis of the farm mechanisation in Odisha. It can be observed that the farm mechanisation has significantly increased in both the time periods i.e. after introduction of the OSAP. The mean difference is comparatively less in case of the period 2008-12 which is 0.705 compared to the period 2013-19 which is 0.267. It can be inferred that after the introduction of OSAP 2013 the farm mechanization in the State has slowed down compared to its growth in the previous years. Further, the growth in farm mechanisation in 2013-19 is comparatively higher from the level of farm mechanisation in the pre-introduction period of the State's agriculture policy.

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Farm Mechanisation	No Agri Policy 2001-07	Agri Policy 2008-12	-0.705*	0.104	0.000	-0.926	-0.484
		Agri Policy 2013-19	-0.971*	0.098	0.000	-1.181	-0.762
	Agri Policy 2008-12	No Agri Policy 2001-07	0.705*	0.104	0.000	0.484	0.926
		Agri Policy 2013-19	-0.267*	0.107	0.025	-0.495	-0.038
	Agri Policy 2013-19	No Agri Policy 2001-07	0.971*	0.098	0.000	0.762	1.181
		Agri Policy 2008-12	0.267*	0.107	0.025	0.038	0.495

*. *The mean difference is significant at the 0.05 level.*

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Net Area Sown	No Agri Policy 2001-07	Agri Policy 2008-12	0.022*	0.005	0.001	0.010	0.033
		Agri Policy 2013-19	0.019*	0.005	0.002	0.008	0.030
	Agri Policy 2008-12	No Agri Policy 2001-07	-0.022*	0.005	0.001	-0.033	-0.010
		Agri Policy 2013-19	-0.003	0.005	0.637	-0.014	0.009
	Agri Policy 2013-19	No Agri Policy 2001-07	-0.019*	0.005	0.002	-0.030	-0.008
		Agri Policy 2008-12	0.003	0.005	0.637	-0.009	0.014

*. *The mean difference is significant at the 0.05 level.*

The table -5 shows the Fisher's Least Significant Difference (LSD) for Net sown area growth in Odisha. It is observed that the introduction of the State's agriculture policy has resulted in the decrease in the new sown area in the State and decrease is significantly higher in the period 2008-12. On the other hand, there is no significant increase in the net sown area during 2013-19 at the same time it is not even going down or negative like the previous years. Further, it is good sign that the new sown area is at least not decreasing day by day.

The table no-6 shows the Fisher's Least Significant Difference (LSD) for the total fertilizer consumption in the State of Odisha. It can be observed that there is a significant increase in the fertilizer consumption in the State during 2008-12 and during 2013-19 compared to the fertilizer consumption in the

period 2001-07. Whereas the total fertilizer consumption during the period after the introduction of OSAP 2013 no significant increase has been observed compared to the previous years i.e. from 2008-12. Thus, it can be concluded that in recent years the fertilizer consumption has not increased significantly but shown a slight decrease which is good indicator that most of farmers have reduced the use of fertilizers in their farms and organic farming is gaining popularity but at a slower pace.

Table -6: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) for Total Fertilizer consumption in Odisha

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Total Fertilizer Consumption	No Agri Policy 2001-07	Agri Policy 2008-12	-0.154*	0.026	0.000	-0.209	-0.099
		Agri Policy 2013-19	-0.151*	0.024	0.000	-0.203	-0.099
	Agri Policy 2008-12	No Agri Policy 2001-07	0.154*	0.026	0.000	0.099	0.209
		Agri Policy 2013-19	0.003	0.027	0.899	-0.053	0.060
	Agri Policy 2013-19	No Agri Policy 2001-07	0.151*	0.024	0.000	0.099	0.203
		Agri Policy 2008-12	-0.003	0.027	0.899	-0.060	0.053

*. The mean difference is significant at the 0.05 level.

The table no-7 depicts the growth in the State's GDP due to agriculture and allied activities. The post-hoc analysis indicates a significant positive growth in the Agriculture gross domestic product of Odisha. However, the contribution of the agriculture sector to the State's GDP has comparatively low in the period 2013-19 compared to the previous test period 2008-12. It can be noted that the difference in the growth of agriculture between the years 2001-07 and 2008-12 is 0.311 whereas, it is 0.225 between the year 2008-12 and the period 2013-19. The analysis infers that there is a substantial impact of the State's agriculture policy in the growth of State's GDP and contribution of agriculture to the GDP as well.

Table -7: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) for States Agricultural Gross Domestic Product

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
States Agri-Gross Domestic Product	No Agri Policy 2001-07	Agri Policy 2008-12	-0.311*	0.055	0.000	-0.429	-0.193
		Agri Policy 2013-19	-0.536*	0.053	0.000	-0.648	-0.424
	Agri Policy 2008-12	No Agri Policy 2001-07	0.311*	0.055	0.000	0.193	0.429
		Agri Policy 2013-19	-0.225*	0.057	0.001	-0.347	-0.103
	Agri Policy 2013-19	No Agri Policy 2001-07	0.536*	0.053	0.000	0.424	0.648
		Agri Policy 2008-12	0.225*	0.057	0.001	0.103	0.347

*. The mean difference is significant at the 0.05 level.

Table -8: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) for Total Agricultural production in Odisha

Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound

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Total Production 000mt /bales	No Agri Policy 2001- 07	Agri Policy 2008-12	-0.077*	0.029	0.016	-0.138	-0.016
		Agri Policy 2013-19	-0.099*	0.027	0.002	-0.157	-0.041
	Agri Policy 2008-12	No Agri Policy 2001-07	0.077*	0.029	0.016	0.016	0.138
		Agri Policy 2013-19	-0.022*	0.030	0.478	-0.085	0.042
	Agri Policy 2013-19	No Agri Policy 2001-07	0.099*	0.027	0.002	0.041	0.157
		Agri Policy 2008-12	0.022*	0.030	0.478	-0.042	0.085

*. The mean difference is significant at the 0.05 level.

Table no-8 shows the comparative analysis of the growth in agriculture production in the State. It also indicates a similar trend of growth as observed for the State's agriculture gross domestic product given in table no.-4.10. However, there is a tremendous growth in agriculture production observed in the year 2008 i.e. after the introduction of OSAP 2008 but later on the growth has slowed down after 2013. It can be observed that the decline in the growth is more than 50% in the recent years compared to the previous test period 2008-12. It can be noted that the difference in the growth of agriculture production during the years 2001-07 and 2008-12 is 0.077 whereas, it is 0.022 between the year 2008-12 and the period 2013-19.

The table no-9 presents the agriculture yield potential of the state of Odisha during the pre and post agriculture policy implementation periods. The interpretation of the above table infers that the increase in the agriculture yield during 2008-12 is significantly higher compared to the period 2001-07. Similarly, the growth in yield potential in kg per hectore during 2013-19 is significantly higher than the previous period of 2008-12. It can be concluded that the agriculture yield has also increased positively after the introduction of states agriculture policy.

Table -9: Post-Hoc Analysis Using Fisher's Least Significant Difference (LSD) for Agricultural yield in Odisha							
Dependent Variable	(I) Policy Period	(J) Policy Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Yield in Kg/Ha	No Agri Policy 2001- 07	Agri Policy 2008-12	-0.071*	0.013	0.000	-0.099	-0.044
		Agri Policy 2013-19	-0.111*	0.012	0.000	-0.137	-0.084
	Agri Policy 2008-12	No Agri Policy 2001-07	0.071*	0.013	0.000	0.044	0.099
		Agri Policy 2013-19	-0.039*	0.014	0.011	-0.068	-0.010
	Agri Policy 2013-19	No Agri Policy 2001-07	0.111*	0.012	0.000	0.084	0.137
		Agri Policy 2008-12	0.039*	0.014	0.011	0.010	0.068

*. The mean difference is significant at the 0.05 level.

Validity of Hypotheses and Findings of the Study

On the basis of results of study shown in the table 1 to table-9, the hypotheses are validated as stated below.

H₀₁: There is no significant impact of agriculture policies in the development of irrigation potential in the State.

(Reject p-value < 0.01)

H₀₂: The State's agriculture policies have no significant impact on total seed distribution among the farmers.

(Reject p-value < 0.01)

H₀₃: The State's agriculture policies have no significant impact on Farm Mechanization. **(Reject p-value < 0.01)**

H₀₄: The State's agriculture policies have no significant impact on the development of Net sown area. **(Reject p-value < 0.01)**

H₀₅: The State's agriculture policies have no significant impact on the development of gross cropped area. **(Accept p-value > 0.05)**

H₀₆: The State's agriculture policies have no significant impact on total fertilizer consumption for agriculture. **(Reject p-value < 0.01)**

H₀₇: There is no significant impact of agriculture policies in improving the contribution of Agriculture to the State's gross domestic product. **(Reject p-value < 0.01)**

H₀₈: There is no significant impact of agriculture policies in increasing the total agriculture production in the State. **(Reject p-value < 0.01)**

H₀₉: The State's agriculture policies have no significant impact on the agriculture yield capacity. **(Reject p-value < 0.01)**

It can be inferred that the agricultural productivity has been increased significantly after the introduction of the agricultural policy in the State. The post-hoc analysis of the ANOVA test results for the variables which have been rejected due to a significant p-value. The Fisher's least significant difference analysis which is a type of post-hoc analysis followed by the F-test shows the significant difference between the study groups or periods. Here, the dependent variables are tested for their mean difference in three time periods i.e. No Agri-policy period 2001-07, Agri policy 2008-12 and post Agricultural policy 2013-19.

III. Conclusion and Policy Implications

This study primarily focussed on the State's agriculture policy and its impact on the development of agriculture in Odisha. A detailed presentation of the Odisha State Agriculture Policy 2008 and 2013 has also been depicted in a tabular form to understand the comparative improvements in the latest policy. This chapter also depicted the trend of agriculture sector development parameters like State's agriculture GDP, agriculture production, agriculture yield in kg per hectare etc. Finally, the hypotheses have been tested which is devised to verify how the OSAP is influencing the agriculture growth and productivity. The results of the ANOVA test and the corresponding post-hoc analysis reveals that the agriculture development has slowed down during post 2013 compared to the period when the OSAP introduced in 2008. However, an overall development has been observed in agriculture sector after the introduction of the State's agriculture policy.

All the above analysis has some policy implications which needs to be strengthened. As in Odisha around 36 percent of rural people are residing below the poverty line and nearly 90 percent of them are found in rural areas, agricultural growth must be accelerated through more extension services. The State has already made progress in the livestock sector and the diversification in the agriculture sector has been started. Still more progress is required in case of irrigation, fertiliser consumption, farm mechanisation etc. to compete with other States. To make this possible a proper policy implementation strategy must be followed. The study can be made area wise for better acknowledgment of true agricultural scenario. In this attempt, study is made on the overall impact of policy on agriculture. But it can be more dynamic if more micro analysis of a particular segment is made.

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