Original Research Article

AN ECONOMIC ANALYSIS OF TRENDS IN COST OF PRODUCTION AND MSP IN INDIA

ABSTRACT

Objectives: To study a two-decade economic analysis of Minimum Support Price (MSP) trends compared to the cost of production of major crops of India and understand the real impact of price policy formed by the Government of India.

Methods: The period of the analysis is from 1999 to 2019 (20 years) and the data sources consulted are Cost of cultivation and Farm Harvest price from Directorate of economics and statistics, Minimum support price from Commission for Agricultural Costs and Prices (CACP) and Awareness report of farmers by Questioner based survey. Compound annual growth rate and percentage analysis are used as a statistical tool for this research. To access the impact, Tamil Nadu has been taken as the model state with two model crops Paddy and Cotton and its comparative analysis is done with reference states Punjab and Maharashtra for Cost of Cultivation components and Profitability.

Findings:

The finding of this research unravels that Wheat, Groundnut and Cotton are getting supported largely due to MSP policy, Paddy and Black gram are barely supportive as there is cutthroat competition between MSP and the Cost of Cultivation and sugarcane is not supported by MSP policy. The comparative and profitability analysis unravels how labour cost is the major cost in Tamil Nadu and paddy is profitable whereas cotton is not.

Novelty: Therefore, this research depicts that MSP has been supporting the farming community on the policy end. But it's not working as a fundamental supporting system for the majority of farmers as it's not exercised by majority of farmers due to low awareness and inefficiency of the system.

Keywords

Minimum support price, Cost of production, Economic analysis, Farmer harvest price, Price policy

JEL Classification Q12, Q13, Q18

INTRODUCTION

Agriculture traces its roots back to the time when men started settling down to cultivate crops around the riverbanks. It has been part and parcel of our civilization for ages. Apart from providing food and raw material, the agriculture sector continues to be the single most important source of livelihood for the masses. In India, 54.6% of the total workforce is engaged in agricultural and allied sector activities **[1]** and accounts for 17.8% of the country's Gross Value Added for the year 2019-20 (at current prices). Despite being the linchpin for

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socio-economic growth, the agriculture sector is innately associated with numerous risks. Agricultural risks are exacerbated by a variety of factors, ranging from climatic variability, weather aberrations, biotic constraints, uncertainties in yield and prices, weak rural infrastructure, imperfect markets and lack of financial services including limited span and design of risk mitigation instruments such as credit and insurance. Minimum Support Price is a form of market intervention by the Government of India to safeguard agricultural producers against any sharp decline in farm prices. The CACP recommendation for the MSP is based on A2+FL cost.

Acharya (1997) **[2]** exclaimed that the instruments of Minimum Support Prices, food subsidy and input subsidies have played an important role in achieving the objectives of food security and accelerated growth of the economy which benefits all the sections of the society. The Situation Assessment Survey of **National Sample Survey Organization (2005)** indicated that only 29% of farmers were aware of MSP and out of that only 6% farmers benefitted from it **[3]** on the other hand, a rapid perception survey conducted by ***The Times of India* (2020) [4]** of over 5022 farmers from 53 districts across 16 states revealed that 59 % of the respondents want the MSP system to be made mandatory law in India. For proper implementation of MSP, we should also look over some foreign policies such as the target Price based subsidy program implemented by China for increasing the overall production of the cotton crop**.** Hence, there is a need to look into how the cost of production of different crops are growing over years and whether MSP is covering the cost of production proportionately giving the farmers a profit margin **[5]**.

Deshpande and Naika (2002) **[6]** found in their micro-level verifications that MSP does not bear any consistent and significant relationship with either the wholesale price or farm harvest price. Cropping pattern is largely influenced by market price and MSP plays a role only when MSP is either equal to or above the market price, this can be observed by the study done by Chand (2003) **[7]** who argues that the price policy implemented in the last four and half decades has mainly benefited wheat and rice among food grains and sugarcane and cotton among other crops, which has resulted in a shift of good quality land and other resources to these crops away from pulses, oilseeds and other crops. Agricultural price policy has been argued to have widened the farm income inequalities. It is further contended that the MSP has outlived its utility and is being used more as a political tool than an economic instrument **[8]**, also has pointed out that MSP is leading to regional imparity in incomes as it is effective only in few states where it is backed by procurement **[9]**. Research work done by

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Sayonee Majumdar (2021) **[10]** proved that the analytical tool used to calculate MSP is highly skewed and is not able to prove the effect of MSP on all types of farmers. Farmers always demand a substantial hike in MSP, whereas pro-free agricultural trade tinkers feel that most of the time, MSP is not in the line with the international prices as well as domestic demand and supply situation. This brings distortions and inefficiencies in the production patterns **[8]**. There is also a feeling among some quarters that the support price for paddy has been increased substantially over the years, which is unwarranted **[11]**. On the implementation front, it is imperative to know the awareness level of farmers and whether they are genuinely receiving the benefit of MSP or not. Hence, this study is designed in such a way that it focuses on providing a more refined solution to the disparity regarding MSP.

The specific objectives of the study are

1. **To assess the trend in Cost of Production and MSP for various crops in India**
2. **To examine the trend in the different components of cost of cultivation**
3. **To assess the relationship between Cost of production, Minimum Support Price and price realized by the farmers.**
4. **To assess the awareness and implementation of the MSP Policy in Tamil Nadu.**

The study would highlight the trends of the cost of production and MSP for different crops and different states of India. Also, the study would throw light on the trends of different components contributing to the Cost of cultivation and the profitability of the farmer. The result of the study would be helpful to the policymakers to understand the functioning of the MSP policy over years and do the needful to enhance the performance.

METHODOLOGY

Data and sources

The data collected for this particular research is from online portals of various government organizations which are working in primary data collection and computations from all over India for various aspects as listed below.

• Secondary data on Cost of cultivation, Cost of Production, and Farm Harvest Price data for various crops from 1999-2000 to 2018-19 is collected from the Directorate of Economics and Statistics, Government of India. Minimum Support Price data was compiled from the Commission on Agricultural Cost and Prices, Government of India.**[12] [13]**

• Wholesale Price Index is collected from their different base years 1993-94, 2004-05 and 2011-12 from the office of the Economic Adviser, Ministry of Commerce & Industry,

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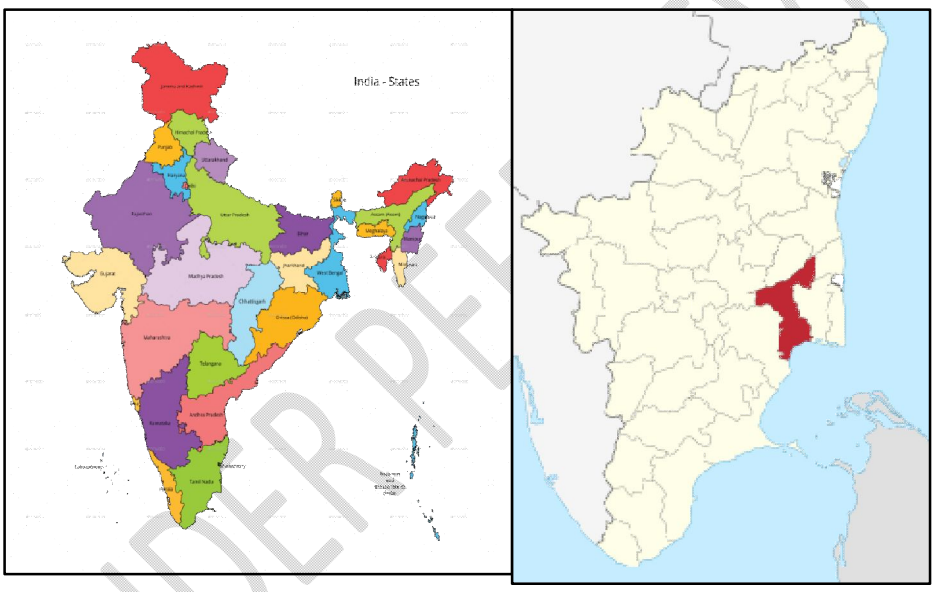
Government of India to deflate the data. 2011-12 is considered as the base year for this research. **[14]**

• Primary data was collected from the sample farmers using an interview schedule which is submitted to the Department of Agriculture Economics, Tamil Nadu Agriculture University.

Study area

- The study area for this research is the whole of India for comparison of trends in Minimum support price and Cost of Production. The crops covered are Paddy, Wheat, Sugarcane, Black Gram, Groundnut and Cotton. For analyzing the trend in the different components of cost of cultivation, relationship between Cost of production, Minimum Support Price and price realized by the farmer and awareness and implementation of the MSP Policy Tamil Nadu has been selected as a sample state with two crops Paddy and Cotton.

Figure 1: India and Tamilnadu Map (Thanjavur district)



*Source: Google images

• Further detailed case study is done on Tamil Nadu for 2 major crops i.e., Paddy and Cotton which are compared with Punjab (Paddy) and Maharashtra (Cotton).

• The case study is conducted in the Thanjavur district of Tamil Nadu for awareness and implementation of MSP policy.

Time period:

Based on the data availability, CAGR was worked out for 20 years from 1999 to 2019. The triannual averages calculated are for 6 time periods from 2000 to 2018. The primary data was collected during the month of August 2021.

Tools of Analysis

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Trend analysis

The trend analysis is done by calculating **Compound Annual Growth Rate (CAGR)** for Cost of Production and MSP for various crops in India done using linear regression analysis. **[15]**

$Y = a\,bt$ ……. (1)

$Ln(y) = Ln(a) + t\,Ln(b)$. … (2)

$$CGR = (Anit\log(B) - 1) * 100$$

$$\boldsymbol{LN(A2 + FL\ cost\ of\ crop) = \alpha + \beta\ time + \theta}$$

Where, Y= Dependent variable, X = Independent variable; $a = intercept\beta = slope$. Dependent variable is the natural log of A2+FL cost. Independent variable is Time.

The comparative study of various cost components of Paddy and Cotton of Tamil Nadu is done by using Punjab and Maharashtra respectively as the reference states as they have higher production and productivity. Triannual averages were computed and expressed as a percentage of the total cost of cultivation. Profitability analysis is done for Tamil Nadu by finding out the gross returns and farm business income again on a triannual basis. Further, the relationship between MSP, Cost of production and Farm harvest price over the years has been found out as a percentage of MSP over COP and percentage of FHP over MSP. **[16][12][13]**

RESULTS AND DISCUSSION

Assessing the trend in Cost of production and MSP

Table 1. CAGR for crops across various states in India

States	Paddy	Wheat	Black gram	Groundnut	Cotton	Sugarcane
Andhra Pradesh	1.59%	-	4.19%	3.04%	2.55%	3.21%
Rajasthan	-	-0.86%	-	-	2.75%	-
Bihar	2.13%	-0.88%	-	-		-
Madhya Pradesh	1.37%	1.85%	0.28%		-1.63%	-
Karnataka	2.22%	-	-	3.16%	-2.51%	-0.23%
Kerala	1.79%	-	-			
Orissa	3.46%	-	4.82%			
Tamil Nadu	2.14%	-	4.07%	3.10%	1.82%	3.77%
Uttar Pradesh	3.11%	0.84%	5.41%			2.93%

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Punjab	1.14%	-0.05%	-	-	-0.39%	-
Haryana	0.68%	0.58%	-	-	1.30%	
Gujarat	-	-1.32%	-	2.20%	-0.11%	-
Maharashtra	-	-	3.44%	4.15%	0.84%	2.00%
Other states	2.26% **(Assam),** 2.66% **(West Bengal)**	-1.09% **(Himachal Pradesh)**	-	-	-	-
Average CAGR	2.04%	-0.58%	3.61%	3.13%	0.51%	2.34%
MSP-CAGR	2.23%	1.70%	4.25%	4.82%	3.42%	1.21%

**Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation); Commission for Agricultural Costs and Prices, Ministry of Agriculture and Farmers Welfare, Government of India (Price policy report).*

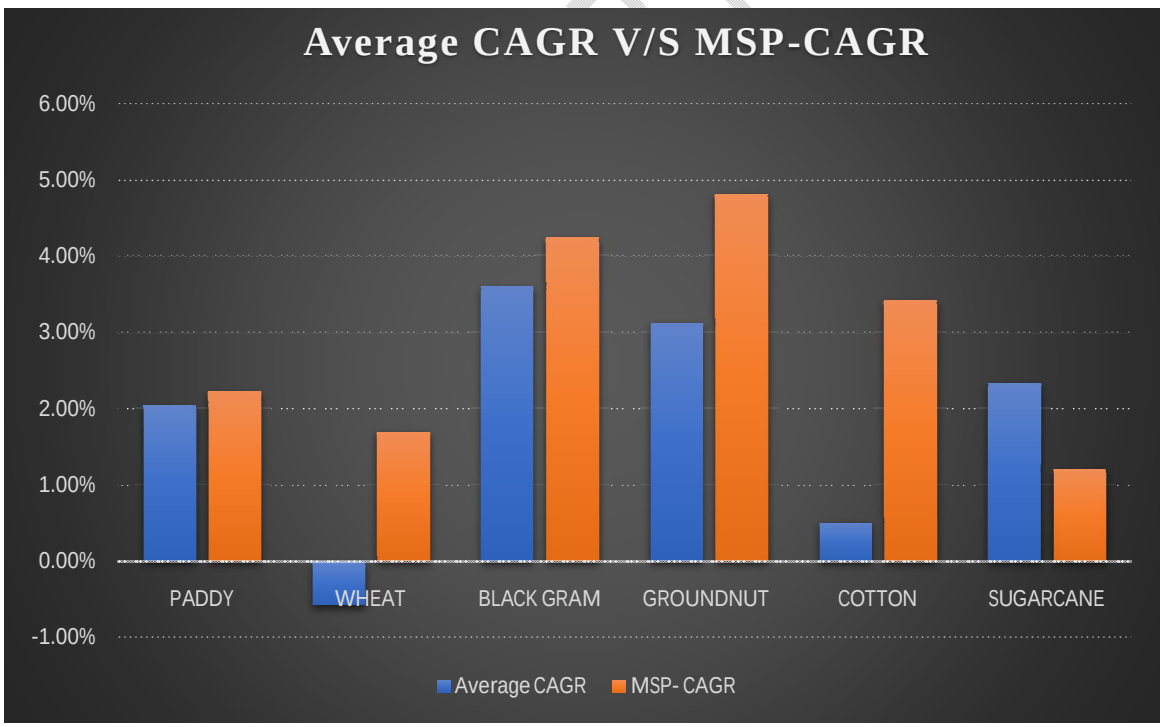

Figure 2: Average CAGR v/s MSP-CAGR.

**Source: Table 1. CAGR for crops across various states in India*

From the above table and graph, we can see how MSP and (A2+FL) cost for different crops is growing at varying CAGR. This graph shows how MSP CGAR of paddy i.e., 2.23% is competing with cost of production CAGR which is 2.04%. As a result, various states like

Uttar Pradesh and Orissa may not be supported by this growing trend of MSP. Wheat MSP CAGR 1.70% is high as compared to its cost of production CAGR which is -0.58%. This is because the cost of production for producing a quintal of produce had been reducing gradually for the last 20 years possibly due to the advancement in high yielding varieties and the advent of mechanization in progressive wheat-growing states like Rajasthan, Bihar, Punjab, Gujarat and Himachal Pradesh. For Black gram, one of the major grams produced in India the MSP CAGR 4.25% is relatively high as compared to other crop's MSP growth rate but still, it is unable to compete with the cost of production of various states like Uttar Pradesh and Orissa. Groundnut MSP CAGR 4.82% and is able to support all the major groundnut producing states as the cost of production CAGR is 3.13%. Cotton MSP CGAR 3.42% is very high as compared to its cost of production CAGR which is 0.51%. Sugarcane is the only crop in this study where MSP CAGR 1.21% is lower than its cost of production CAGR i.e., 2.34%.

Analysis of the influence of different cost components to cost of cultivation and performing profitability analysis

Table 2. Triannual average values of different cost components of Paddy in Tamil Nadu and Punjab

(Rs/Qtl in Real terms)

TAMIL NADU						
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18
Human Labour	17529.67	15101.03	16085.59	19536.48	21639.21	20647.10
Animal labour	1561.72	1086.99	696.33	419.09	230.36	131.30
Machine labour	4286.82	5260.71	6222.96	7892.16	8652.99	9426.48
Seed	4161.03	3379.55	3137.26	5231.01	5454.97	6424.67
Fertilizers & Manure	5887.74	5445.26	5277.90	5780.94	7946.51	7179.98
Insecticides	606.89	697.95	675.70	1095.75	1255.14	1316.45
Irrigation charges	1894.82	2078.93	1503.61	1309.70	1583.05	3266.38
Others	977.91	902.31	896.06	1075.73	1238.39	1663.84
Operational cost	36906.61	33952.72	34495.41	42340.87	48000.62	50056.20
Fixed costs	16410.76	14582.92	15298.24	14650.25	15444.26	19510.84
Total costs	53317.37	48535.62	49793.65	56991.13	63444.88	69567.04
PUNJAB						
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18
Human Labour	7946.43	7484.73	8311.11	11844.26	12674.83	14431.71

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Animal labour	98.53	79.19	149.32	144.04	39.78	29.78
Machine labour	5124.66	5080.50	4898.70	5083.01	5106.58	5802.86
Seed	981.72	952.52	1015.08	1342.86	1451.87	1542.78
Fertilizers & Manure	3983.38	3928.34	3541.88	3390.33	3628.39	3214.71
Insecticides	2109.08	2281.55	2064.87	2555.99	3235.89	3879.70
Irrigation charges	4271.12	4602.03	2253.19	1997.40	2231.60	2455.10
Others	688.96	700.58	642.51	733.44	756.43	825.53
Operational costs	25203.88	25109.44	22876.67	27091.34	29125.38	32182.17
Fixed costs	20160.50	22403.94	25564.19	29618.66	32762.56	36824.49
Total costs	45364.38	47513.38	48426.57	56709.99	61887.93	69006.66

***Source:** Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation)*

Table 3. Triannual averages expressed as a percentage to the total cost of cultivation (Percentage)

TAMIL NADU

Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18	% Increase
Human Labour	32.88	31.11	32.30	34.28	34.11	29.68	-9.73
Animal Labour	2.93	2.24	1.40	0.74	0.36	0.19	-93.56
Machine Labour	8.04	10.84	12.50	13.85	13.64	13.55	68.53
Seed	7.80	6.96	6.30	9.18	8.60	9.24	18.34
Fertilizer & Manure	11.04	11.22	10.60	10.14	12.53	10.32	-6.54
Insecticides	1.14	1.44	1.36	1.92	1.98	1.89	66.25
Irrigation charges	3.55	4.28	3.02	2.30	2.50	4.70	32.12
Others	1.83	1.86	1.80	1.89	1.95	2.39	30.40
Variable costs	69.22	69.95	69.28	74.29	75.66	71.95	3.95
Fixed costs	30.78	30.05	30.72	25.71	24.34	28.05	-8.88

PUNJAB

Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18	% Increase
Human Labour	17.52	15.75	17.16	20.89	20.48	20.91	19.39
Animal	0.22	0.17	0.31	0.25	0.06	0.04	-80.13

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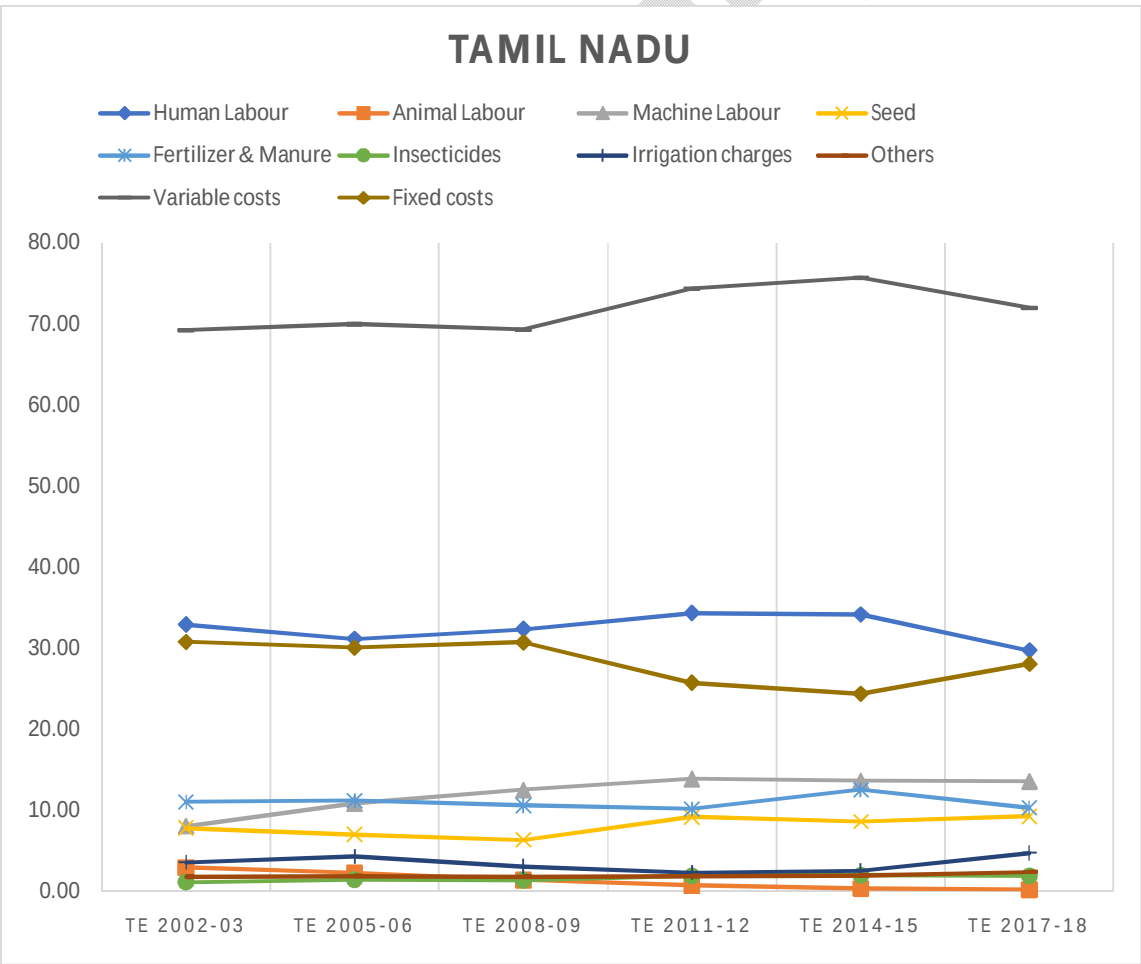
Labour							
Machine Labour	11.30	10.69	10.12	8.96	8.25	8.41	-25.56
Seed	2.16	2.00	2.10	2.37	2.35	2.24	3.31
Fertilizer & Manure	8.78	8.27	7.31	5.98	5.86	4.66	-46.95
Insecticides	4.65	4.80	4.26	4.51	5.23	5.62	20.93
Irrigation charges	9.42	9.69	4.65	3.52	3.61	3.56	-62.21
Others	1.52	1.47	1.33	1.29	1.22	1.20	-21.23
Variable costs	55.56	52.85	47.24	47.77	47.06	46.64	-16.06
Fixed costs	44.44	47.15	52.79	52.23	52.94	53.36	20.08

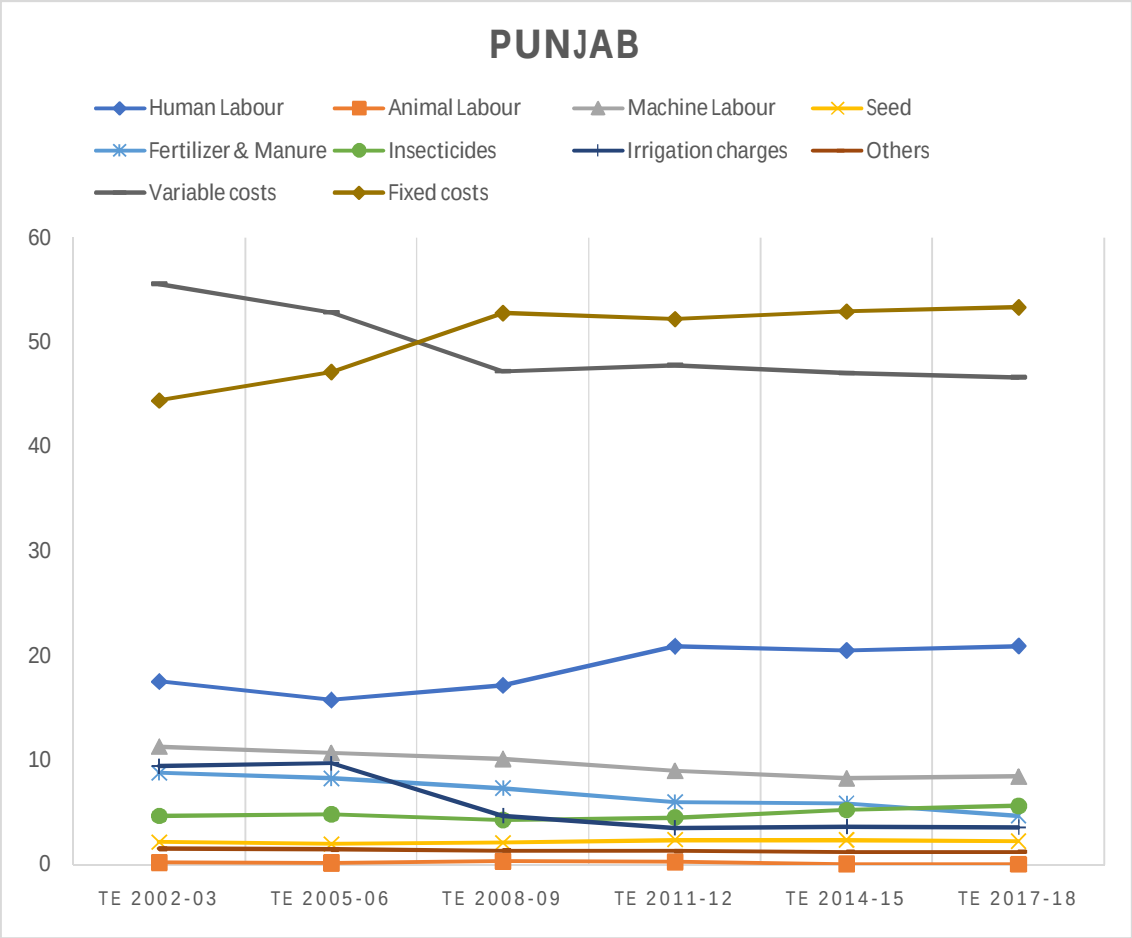
**Source: Table 2. Triannual average values of different cost components of Paddy in Tamil Nadu and Punjab*

Figure 3: Triannual averages expressed as percentage to total cost of cultivation (Tamil Nadu)



**Source: Table 3. Triannual averages expressed as percentage to total cost of cultivation*

Figure 4: Triannual averages expressed as percentage to total cost of cultivation (Punjab)



**Source: Table 3. Triannual averages expressed as a percentage to the total cost of cultivation*

- In Tamil Nadu, the cost of human labour, animal labour, fertilizers and manure and fixed costs have decreased with animal labour cost being decreased the most. The costs of machine labour, seed, insecticides, irrigation, miscellaneous and total variable costs have increased over the years with machine labour costs showing a major leap. This shows that the use of machinery and insecticides has been increasingly adopted by the paddy farmers in the state as their costs have shown a major increase say 68.53 % and 66.25 % respectively. Either they rise in the quantity of input usage or rise in market price should have contributed to the increase in such costs. The increasing cost of machine labour is backed by decreasing animal labour cost and human labour cost.

- In Punjab, the cost of animal labour, machine labour, fertilizers and manure, irrigation and total variable costs have shown a decrease over the years with animal labour cost being decreased the most. There has been a positive increase percentage of costs of human labour, seed, insecticides and total fixed costs. The increase in human labour costs may be due to the increase in wage rate and labour demand. The increase in fixed costs shows that there may be a hike in inland rent or revenue paid by the farmers.
- In comparison, we notice that the cost of human labour has significantly contributed to the rise in variable costs in both states. Animal labour costs have been decreasing to a greater extent in both states. The contribution of machine labour cost has been decreasing in Punjab while it has been increasing greatly in Tamil Nadu. Paddy farmers of Tamil Nadu have been spending more on seeds and fertilizers while Punjab farmers have spent relatively more on insecticides and irrigation.

Table 4. Profitability analysis of Paddy farmers of Tamil Nadu

The gross income was calculated by multiplying derived yield and farm harvest price. The Cost C2 of cost of cultivation was subtracted from gross income to get net profit. The Cost A2 + FL was subtracted from gross income to arrive and farm business income.

(All the prices are in Rs/ha in real terms)

Year	Cost A2+FL	Cost C2	Yield (Qtl/ha)	FHP	Gross Income	Net profit= Gross Income-C2	Farm Business Income= Gross Income-(A2+FL)
1998-99	33848.4	44238.49	47.88	1001.791	47965.73	3727.24	14117.33
1999-00	37880.38	52959.52	47.36	1006.302	47658.47	-5301.05	9778.093
2000-01	34265.54	46586.62	48.67	957.8678	46619.42	32.80038	12353.88
2001-02	34114.69	46522.57	45.2	906.4829	40973.03	-5549.54	6858.337
2002-03	34632.82	49662.92	45.67	913.4098	41715.43	-7947.5	7082.61
2003-04	32383.07	44379.65	44.62	881.1179	39315.48	-5064.17	6932.414
2004-05	31159.85	41926.42	43.64	799.39	34885.38	-7041.04	3725.534
2005-06	31284.58	44322.23	42.92	738.281	31687.02	-12635.2	402.4411
2006-07	32104.09	45172.62	50.79	705.2841	35821.38	-9351.24	3717.288
2007-08	33925.58	46042.24	49.36	934.3972	46121.84	79.60199	12196.26
2008-09	33153.51	46573.63	42	1075.392	45166.44	-1407.19	12012.93
2009-10	38388.52	52407.51	48.94	1105.24	54090.42	1682.913	15701.9

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2010-11	38794.09	51895.93	50.32	1079.576	54324.26	2428.338	15530.17
2011-12	43071.39	55772.9	50.16	1009	50611.44	-5161.46	7540.051
2012-13	44763.84	57479.39	48.95	1223.573	59893.92	2414.531	15130.08
2013-14	46121.55	59243.76	52.99	1250.667	66272.83	7029.065	20151.27
2014-15	45515.59	60730.62	49.49	1257.243	62220.97	1490.349	16705.37
2015-16	47546.82	64275.21	49.13	1215.132	59699.44	-4575.76	12152.62
2016-17	49669.33	67449.27	47.29	1292.115	61104.1	-6345.17	11434.77
2017-18	48102.24	67220.07	46.21	1380.331	63785.08	-3434.98	15682.85

**Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation and Farmer harvest price)*

Table 5. Triannual averages for the above data

	Cost C2	Cost A2+FL	Gross Income	Net profit	Farm Business Income
TE 2002-03	47590.7	34337.68	43102.63	-4488.08	8764.942
TE 2005-06	43542.77	31609.16	35295.96	-8246.81	3686.796
TE 2008-09	45929.5	33061.06	42369.89	-3559.61	9308.826
TE 2011-12	53358.78	40084.66	53008.71	-350.071	12924.04
TE 2014-15	59151.26	45466.99	62795.9	3644.648	17328.91
TE 2017-18	66314.85	48439.46	61529.54	-4785.3	13090.08

**Source: Table 4. Profitability analysis of Paddy farmers of Tamil Nadu*

- The net profit has been negative for all the triannual averages. This does not mean that the farmers were incurring losses since cost C2 takes into consideration the interests and rent on owned capital assets. The farm business income gives a much clearer view and is positive for all the triannual averages. This indicates that the farmers were getting profit as Cost A2 +FL includes the actual cost that is paid by the farmer.

Table 6. Triannual average values of different cost components of Cotton in Tamil Nadu and Maharashtra

(Rs/Qtl in Real terms)

IL NADU						
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18
Human Labour	22090.89	18611.59	19101.22	28669.80	35720.34	36101.17
Animal Labour	2964.71	841.59	350.55	200.33	224.67	2453.72

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Machine Labour	1379.50	3089.67	3162.74	3832.26	3716.52	3991.06
Seed	1299.77	1990.10	2269.72	2066.96	2906.76	3662.16
Fertilizer & Manure	3944.71	4530.48	5220.96	7198.58	8405.22	9227.92
Insecticides	1651.51	1534.26	1354.83	1486.83	1989.40	3092.42
Irrigation charges	1878.80	1480.22	1029.39	1032.82	787.02	714.42
Others	699.21	761.39	664.66	1033.58	1067.64	4155.61
Operational costs	35909.10	32839.30	33154.06	45521.15	54817.57	63398.48
Fixed costs	19111.34	14914.33	9998.28	14605.54	16048.60	22027.98
Total costs	55020.45	47753.63	43152.34	60126.69	70866.17	85426.46
MAHARASHTRA						
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18
Human Labour	8005.42	7224.84	8503.94	17420.58	21302.05	24724.37
Animal labour	6454.97	7892.83	7689.57	6674.57	6554.42	6119.69
Machine labour	1052.12	1121.72	959.26	1987.92	3240.30	4360.30
Seed	1727.38	2731.63	2688.72	3203.65	3245.34	3222.60
Fertilizers&Manure	3545.63	2708.53	3333.85	5512.04	8860.09	7813.52
Insecticides	1123.02	954.07	802.75	1692.39	2357.34	2590.28
Irrigation charges	700.74	716.41	495.50	1259.04	1744.08	2399.91
Others	661.51	724.15	706.40	1021.86	1291.99	1737.45
Operational costs	23270.79	24074.18	25179.99	38772.05	48595.61	52968.13
Fixed costs	8245.80	8939.35	9512.51	15209.78	16452.30	18355.17
Total costs	31516.59	33013.53	34692.50	53981.78	65047.92	71323.29

**Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation)*

Table 7. Triannual averages expressed as a percentage of the total cost of cultivation

TAMIL NADU							
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18	% Increase
Human Labour	40.15	38.97	44.26	47.68	50.41	42.26	5.25
Animal Labour	5.39	1.76	0.81	0.33	0.32	2.87	-46.69
Machine Labour	2.51	6.47	7.33	6.37	5.24	4.67	86.34
Seed	2.36	4.17	5.26	3.44	4.10	4.29	81.47
Fertilizer & Manure	7.17	9.49	12.10	11.97	11.86	10.80	50.67

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Insecticides	3.00	3.21	3.14	2.47	2.81	3.62	20.60
Irrigation charges	3.41	3.10	2.39	1.72	1.11	0.84	-75.51
Others	1.27	1.59	1.54	1.72	1.51	4.86	282.79
Operational costs	65.27	68.77	76.83	75.71	77.35	74.21	13.71
Fixed costs	34.73	31.23	23.17	24.29	22.65	25.79	-25.76

MAHARASHTRA							
Cost particulars	TE 2002-03	TE 2005-06	TE 2008-09	TE 2011-12	TE 2014-15	TE 2017-18	% Increase
Human Labour	25.40	21.88	24.51	32.27	32.75	34.67	36.47
Animal Labour	20.48	23.91	22.16	12.36	10.08	8.58	-58.11
Machine Labour	3.34	3.40	2.77	3.68	4.98	6.11	83.13
Seed	5.48	8.27	7.75	5.93	4.99	4.52	-17.56
Fertilizer & Manure	11.25	8.20	9.61	10.21	13.62	10.96	-2.62
Insecticides	3.56	2.89	2.31	3.14	3.62	3.63	1.92
Irrigation charges	2.22	2.17	1.43	2.33	2.68	3.36	51.34
Others	2.10	2.19	2.04	1.89	1.99	2.44	16.06
Operational costs	73.84	72.92	72.58	71.82	74.71	74.26	0.58
Fixed costs	26.16	27.08	27.42	28.18	25.29	25.74	-1.64

**Source: Table 6. Triannual average values of different cost components of cotton in Tamil Nadu and Maharashtra*

Figure 5: Triannual averages expressed as a percentage to the total cost of cultivation (Tamil Nadu)

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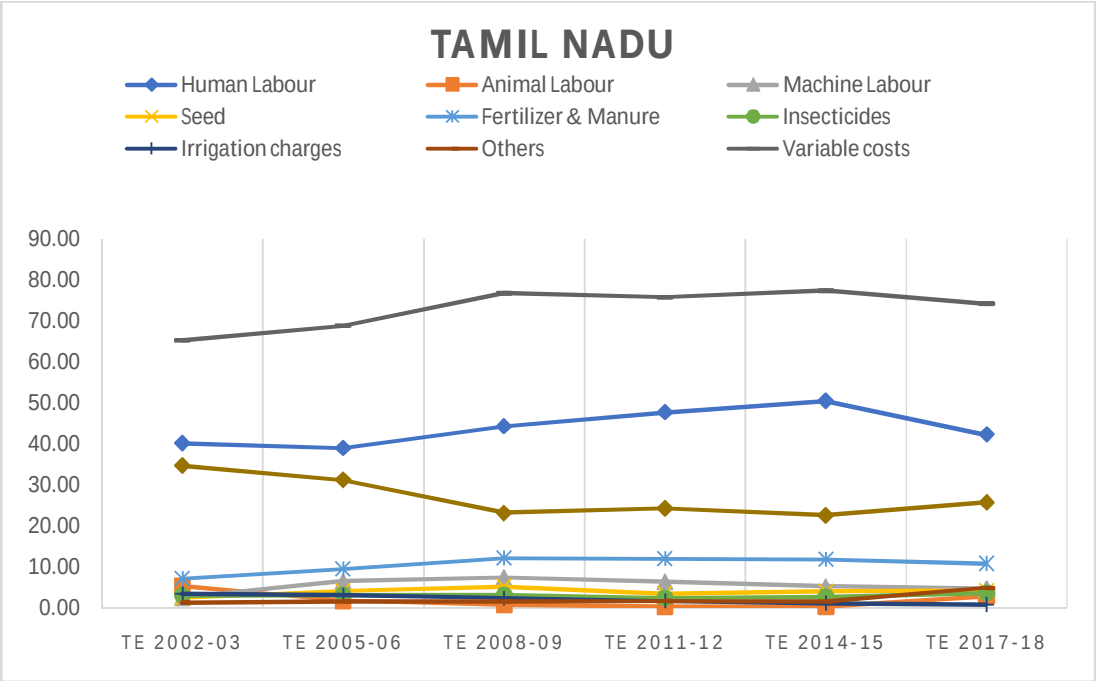
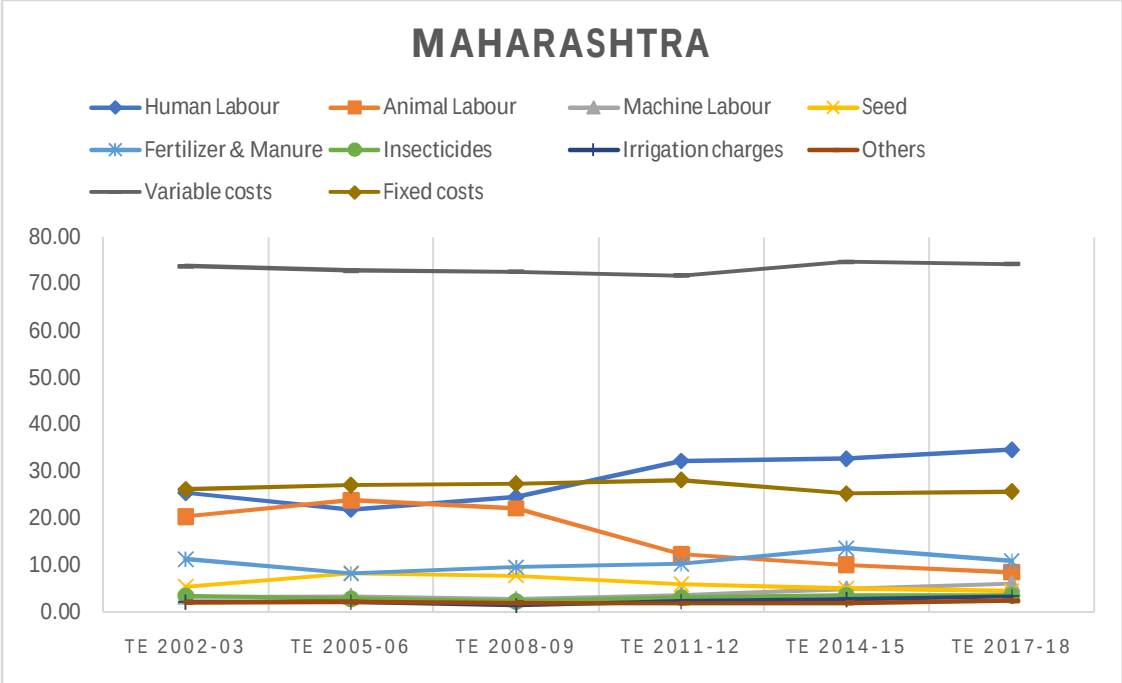


**Source: Table 6. Triannual averages expressed as percentage of total cost of cultivation*

Figure 6: Triannual averages expressed as percentage to total cost of cultivation (Maharashtra)



**Source: Table 6. Triannual averages expressed as a percentage of the total cost of cultivation*

- In Tamil Nadu, the costs for animal labour, irrigation and fixed costs have declined over the years with animal labour cost decreasing the most. The spending by the cotton cultivators has been increasing for human labour, machinery, seeds, fertilizer and manure, miscellaneous costs and ultimately the total variable cost. The hike in

seed cost may be due to the use of hybrid seeds by the farmers. The miscellaneous and machine labour costs have shown a greater increase. The fixed cost has shown a decrease indicating that either most of the cotton cultivators have their land or the land rent or revenue had reduced.

- In Maharashtra, there has been a decrease in the costs of animal labour, seed, fertilizer and manure and fixed costs over the years. The cost incurred for animal labour had shown the greatest decrease. The costs of human labour, machine labour, insecticides, irrigation, miscellaneous and total variable costs have increased. The cost of machine labour has shown a major increase among other costs. The decrease in animal labour cost led to the shift to human and machine labour, thereby increasing their costs. The reduction in seed cost may be due to the intervention of the government through subsidies. The variable cost has only slightly increased as the increase of one component is complemented by the decrease of another. The fixed costs have shown a very slight decrease.
- In both the states, the increase in human labour cost (wage rate) and machinery cost has contributed to increasing the cost of cotton cultivation. Animal labour costs had been higher in Maharashtra than in Tamil Nadu. There has been a decreased cost for irrigation in Tamil Nadu while it had increased in Maharashtra. The spending for insecticides and nutrient management has been similar in both states.

Table 8. Profitability analysis of cotton growers in Tamil Nadu

(All prices are in Rs/ha in real terms)

Year	Cost C2	Cost A2 + FL	Yield (Rs/qtl)	FHP	Gross Income	Net profit= Gross Income- C2	Farm Business Income= Gross Income- (A2+FL)
1998-99	47511.63	34589.22	10.04	3599.80	36141.94	-11369.7	1552.726
1999-00	52285.7	35044.59	11.24	3443.57	38705.68	-13580	3661.091
2000-01	51687.37	30964.77	9.22	3241.73	29888.7	-21798.7	-1076.06
2001-02	56279.71	36689.53	13.04	2810.10	36643.67	-19636	-45.8637
2002-03	53535.28	38982.89	11.78	3080.35	36286.49	-17248.8	-2696.39
2003-04	56733.59	39794.34	13.7	3196.96	43798.38	-12935.2	4004.033
2004-05	42432.46	31239.62	11.95	2729.93	32622.7	-9809.76	1383.083
2005-06	42852	31234.77	10.55	2352.34	24817.15	-18034.8	-6417.61
2006-07	40614.72	29862.75	14.79	2136.88	31604.53	-9010.19	1741.774
2007-08	35513.26	27589.68	11.89	2887.53	34332.71	-1180.55	6743.027
2008-09	51486.4	42028.99	20.62	3528.47	72757.13	21270.73	30728.13
2009-10	56710.42	44080.8	18.45	3500.72	64588.3	7877.879	20507.5
2010-11	61704.87	46009.38	19.85	3356.38	66624.16	4919.29	20614.78

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2011-12	60798.82	47137.56	14.41	3142.00	45276.22	-15522.6	-1861.34
2012-13	68058.88	52473.02	16.19	3659.49	59247.22	-8811.66	6774.205
2013-14	66036.87	51878.66	13.93	4040.89	56289.58	-9747.29	4410.919
2014-15	77820.78	61077.7	23.51	3337.14	78456.11	635.3273	17378.41
2015-16	88779.38	70516.18	24.68	3943.48	97325.14	8545.759	26808.96
2016-17	91437.89	67567	14.63	4469.53	65389.28	-26048.6	-2177.72
2017-18	107250.3	83646.31	18.25	4498.69	82101.17	-25149.1	-1545.13

**Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation and Farmer harvest price)*

Table 9. Triannual averages for the above data

	Cost C2	Cost A2+FL	Gross Income	Net profit	Farm Business Income
TE 2002-03	53834.12	35545.73	34272.96	-19561.2	-1272.77
TE 2005-06	47339.35	34089.58	33746.08	-13593.3	-343.5
TE 2008-09	42538.13	33160.48	46231.45	3693.327	13070.98
TE 2011-12	59738.04	45742.58	58829.56	-908.476	13086.98
TE 2014-15	70638.84	55143.13	64664.3	-5974.54	9521.178
TE 2017-18	95822.52	73909.83	81605.2	-14217.3	7695.368

**Source: Table 8. Profitability analysis of cotton growers in Tamil Nadu.*

- The triannual averages of net profit are negative except for the triannual average of 2008-09. The farm business income was initially negative and has then increased and has started to decrease in recent years ending at Rs. 7695.36 /ha in the triannual average 2017-18.

Table 10. Comparative analysis of COP, MSP and FHP realized by the farmer (paddy)

(Rs/quintal)

PADDY					
Year	COP (A2+FL)	MSP	MSP/COP	FHP	FHP/MSP
1998-99	706.94	945.67	134%	1001.79	106%
1999-00	799.84	1016.37	127%	1006.30	99%
2000-01	704.04	986.04	140%	957.87	97%
2001-02	754.75	988.07	131%	906.48	92%
2002-03	758.33	990.55	131%	913.41	92%
2003-04	725.75	939.3	129%	881.12	94%

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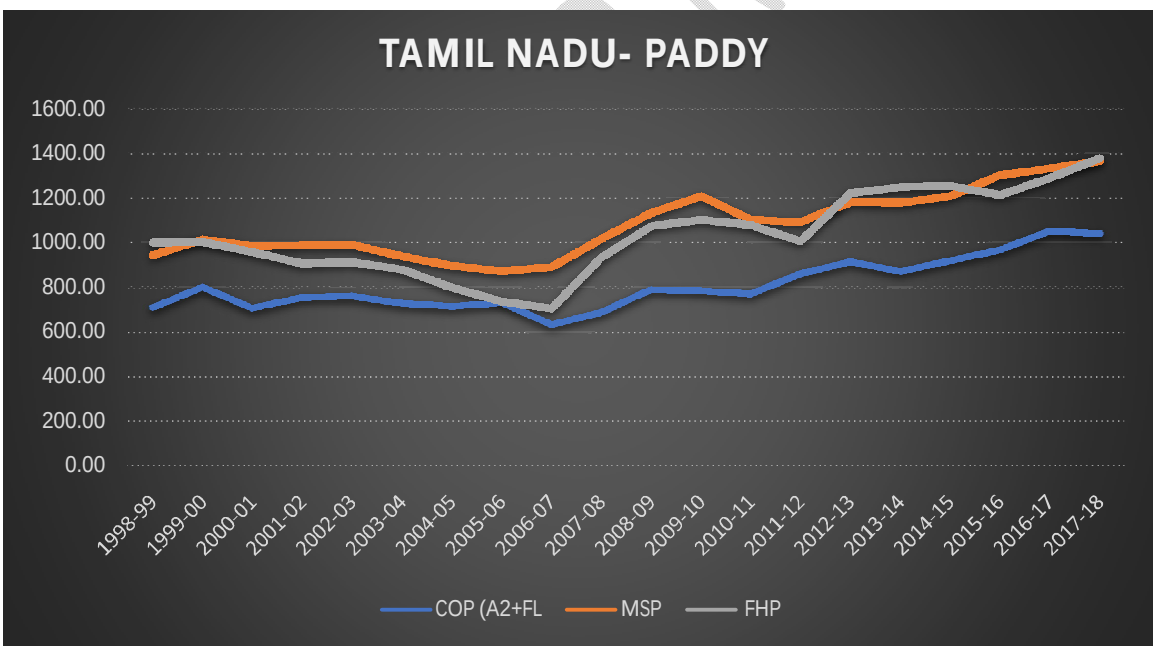
2004-05	714.02	897.75	126%	799.39*	89%
2005-06	728.90	874.28	120%	738.28	84%
2006-07	632.09	890.37	141%	705.28	79%
2007-08	687.31	1017.4	148%	934.40	92%
2008-09	789.37	1133.62	144%	1075.39	95%
2009-10	784.40	1211.47	154%	1105.24	91%
2010-11	770.95	1105.72	143%	1079.58	98%
2011-12	858.68	1095	128%	1009.00	92%
2012-13	914.48	1183.35	129%	1223.57	103%
2013-14	870.38	1180	136%	1250.67	106%
2014-15	919.69	1211.59	132%	1257.24	104%
2015-16	967.78	1303.56	135%	1215.13	93%
2016-17	1050.31	1335.13	127%	1292.11	97%
2017-18	1040.95	1366.41	131%	1380.33	101%

**Average of the preceding and succeeding year was taken for computation since data was unavailable*Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation, Farmer harvest price and MSP)*

Figure 7: Comparative analysis of COP, MSP and FHP (Paddy)



**Source: Table 10. Comparative analysis of COP, MSP and FHP realized by the farmer (Paddy)*

- For Paddy in Tamil Nadu, we find that the centrally announced MSP had always been greater than the cost of production from 1998 to 2018 and the farmer's profit margin has ranged from 54% to 20%.
- The farm harvest prices realized had mostly been slightly lesser than MSP except for 5 years. The prices are closer to MSP every year.

- Hence, the fixation of MSP has been credible for Paddy in Tamil Nadu as it covers the cost of production incurred by the farmers. However, much intervention has to be done in its implementation as the farm harvest prices received by the farmers have to be greater than the MSP for remuneration.

Table 11. Comparative analysis of COP, MSP and FHP realized by the farmer (Cotton)

COTTON(Rs/quintal)					
Year	COP (A2+FL)	MSP	MSP/COP	FHP	FHP/MSP
1998-99	3445.14	3211.13	93%	3599.80	112%
1999-00	3117.85	3371.11	108%	3443.57	102%
2000-01	3358.43	3239.85	96%	3241.73	100%
2001-02	2813.61	3218.01	114%	2810.10	87%
2002-03	3309.24	3146.97	95%	3080.35	98%
2003-04	2904.70	3034.04	104%	3196.96	105%
2004-05	2614.19	2904.02	111%	2729.93*	94%
2005-06	2960.64	2794.71	94%	2352.34	84%
2006-07	2019.12	2636.05	131%	2136.88	81%
2007-08	2320.41	2563.57	110%	2887.53	113%
2008-09	2038.26	3407.06	167%	3528.47	104%
2009-10	2389.20	3282.30	137%	3500.72	107%
2010-11	2317.85	2995.80	129%	3356.38	112%
2011-12	3271.17	3050.00	93%	3142.00	103%
2012-13	3241.08	3507.95	108%	3659.49	104%
2013-14	3724.24	3422.22	92%	4040.89	118%
2014-15	2597.95	3424.06	132%	3337.14	97%
15-16	2857.22	3600.73	126%	3943.48	110%
2016-17	4618.39	3593.19	78%	4469.53	124%
2017-18	4583.36	3629.24	79%	4498.69	124%

**Average of the preceding and succeeding year was taken for computation since data was unavailable*
**Source: Directorate of economics and statistics, Ministry of agriculture, Government of India (cost of cultivation and Farmer harvest price); Commission for Agricultural Costs and Prices, Ministry of Agriculture and Farmers Welfare, Government of India (Price policy report)*

Figure 8: Comparative analysis of COP, MSP and FHP (Cotton)

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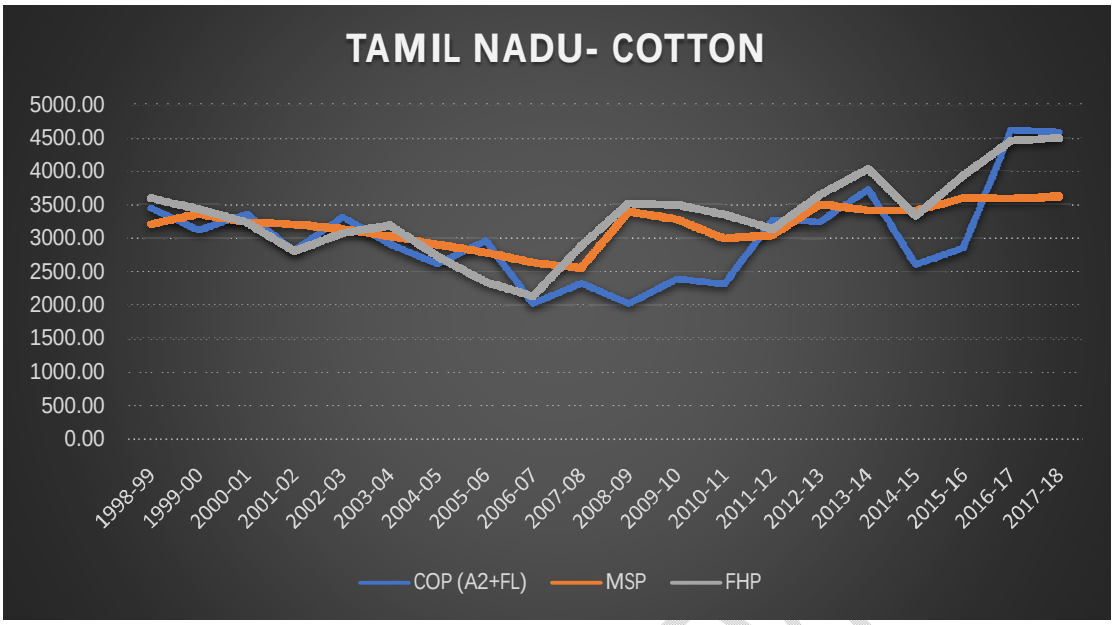

*Source: Table 11. Comparative analysis of COP, MSP and FHP realized by the farmer (Cotton)

- For Cotton in Tamil Nadu, the centrally announced MSP shows a fluctuating trend. Out of the 20 years taken for analysis, MSP had been greater than the Cost of Production for 12 years. While MSP covers the cost of production, the profit margin received by the farmers had been ranging from 67% to 4 %.
- The Farm Harvest prices realized by the farmers had been mostly higher than MSP.
- Therefore, the fixation of MSP in Cotton has to be revised for as shown by the case of Tamil Nadu that it is not covering the cost of production for all the years. The implementation of MSP for cotton in Tamil Nadu has been quite successful as the farm harvest prices received by the farmer had been mostly greater than MSP. The objective of formulating MSP has succeeded in making cotton cultivation beneficial to the farmers.

5. Primary data analysis for knowing about the awareness level and implementation of MSP policy

From the interaction with farmers of Thanjavur district, Tamil Nadu using an already prepared questionnaire, the following findings related to the awareness and implementation of MSP were observed:

- The state announced a bonus for MSP of Paddy (Rs. 70/quintal) has helped the farmers in covering transportation charges.
- MSP has covered the cost of production of Paddy with MSP being 1.26 to 1.96 times COP.
- Most of the respondents were aware of the presence of MSP and the source of information was mass media (newspapers, television). The farmers always have a choice to sell their produce in DPC whenever the market price was low
- For cotton also, the price realized in the regulated market has been higher than the announced MSP.

- The constraints faced by the farmers include time delay (due to inadequate winnowing and drying facilities) and the presence of corruption (Rs. 1/kg for paddy). Thus, the benefits of MSP have been realized by the farmers through DPCs for Paddy, still, improvements have to be made to overcome the shortcomings.

SUMMARY AND CONCLUSION

In India, Agriculture plays a vital role, both as a source of livelihood and as a developmental component in generating and sustaining a higher national income. Out of total national income, about 30 per cent is contributed by agriculture and allied sectors. But if we compare it with developed countries, this is still very high. On average, it is 5 per cent in the UK,4 per cent in the US,14percent in France,16 per cent in Australia,21percent in Japan and 32 per cent in Russia. Hence the economic situation of the country is affected by agricultural production. Assurance of minimum support price by the government helps instil confidence and serves as a safety net during unprecedented situations of price fall in the market. The Minimum Support Price is such an important policy of the Union Government to determine the floor price of major agricultural produces every year for protecting the farmers from the middlemen and fluctuating market conditions as it provides them with an assured market in addition to a minimum assured return.

The following conclusions can culminate from the study:

- From CAGR analysis, it is concluded that MSP is growing at a faster rate than the Cost of Production for the majority of crops with some exceptions. Hence, the MSP fixation by the union government has been credible. The MSP should be proportionate to the rise in the cost of production for all crops without any exceptions.
- In Tamil Nadu among the different cost components of Paddy, the human labour cost followed by fixed costs contributes to much of total variable costs. While in Punjab, the fixed costs have been overtaking the variable costs in recent years. The human labour costs are contributing more than machine labour costs in both states.
- For Cotton, the human labour costs followed by the fixed costs contribute a greater share to the total costs in Tamil Nadu. In Maharashtra, the share of miscellaneous costs incurred by the farmer is showing an increase in recent years.
- The profitability analysis using farm harvest price of Paddy and cotton in Tamil Nadu shows that the farm business income was positive for Paddy and started to decrease for Cotton in recent years. So, the government must procure the produce from farmers whenever prices fall below MSP.
- In Tamil Nadu, MSP announced for Paddy covered the cost of production for all the years while cotton covered the cost of production for the majority of the years.
- Thus, the announcement of MSP serves as insurance to the farmer as he can opt to sell his produce to the government when the price in the market is less. The MSP should be covering the cost of production of crops not by chance but by rule. The government should make much intervention on the implementation front to make the policy more successful and effective.

To improve the MSP procurement system and make it more effective, the following recommendations are offered:

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- Firstly, the targeted population should be made aware of most of the aspects of the scheme like prevailing MSP, time of their announcement, the process of procurement, facilities provided by the Government and payment mechanism. In the process, the farmers will become empowered which would give them legitimate dues.
- Improved facilities at procurement centres, such as drying yards, weighing bridges, toilets, etc. should be provided to the farmers. More godowns should be set up and maintained properly for better storage and reduction of wastage. The vigilance can be increased to overcome unfair practices in DPCs.
- Legal provisions can be made for MSP as it will create much more emphasis. Though MSP policy has been in practice for a long time, there is no legal provision by the government. This has created apprehensions among the farmers fearing that MSP will be withdrawn after the announcement of Farm bills, 2020.
- Government has to be proactive and facilitate procurement when farm harvest prices fall below MSP. Not only food grains and the major producing states should be benefitted but all states should benefit from MSP policy. The State government can probe in it this area and announce bonuses if they found their cost of production higher than the national average.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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