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Minimum Support Price (MSP) Boon or Bane: A Study on The Economic Impacts of MSP

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Abstract
The Minimum Support Price (MSP) plays a vital role in India's agricultural landscape, serving as a tool to promote food security and protect livelihood of farmers. This study explores how changes in MSP affect different aspects of the agricultural economy, from the area farmers devote to certain crops, to export volumes, and ultimately, their incomes. By combining regression analysis with content-based insights, the research examines both the measurable impact of MSP on cultivation patterns and its broader influence on agricultural exports. It also considers how factors like crop type, regional variation, and market conditions shape these outcomes. While MSP provides income stability for many farmers, it can also lead to unintended consequences such as market imbalances and fiscal pressures. The study concludes with policy suggestions contributing to the ongoing studies on how to strengthen agricultural policy in India.

Keywords: Minimum Support Price, Area under Cultivation, Farmer Income, Crop Yield, Government Action

1. Introduction
According to Aditya et al., (2017a) , The Public Distribution System is a chain of government-run shops that provide basic goods like rice and wheat to customers at discounted costs. Price support was first proposed in 2005 by the Planning Commission, a former government agency, just before India's Green Revolution, when agricultural innovation reached unprecedented heights. This approach was designed to incentivize farmers to adopt new technologies and improve existing farming practices. Later, in 1965, the Jha Committee, a separate government group, recommended the establishment of an official price support scheme that included the cost of growing crops. This led to the creation of the Commission on Agricultural Costs and Prices, or CACP as it is currently known (Kadasiddappa et al., 2013).

The CACP's mission is comprised on three primary objectives. firstly, reasonable rates for farmers. Farmers are protected from financial difficulty by the MSP, which prevents market prices from falling. Making sure that consumers receive fair pricing, or that low-income consumers can afford the costs of staple foods because the PDS (Public Distribution System), which is funded by MSP purchases, allows them to do so. Finally Setting MSPs for a variety of crops will encourage farmers to grow a diversity of important and environmentally friendly crops, so promoting sustainable resource use.

The primary objective is to conduct a comprehensive analysis of the consequences of implementing MSP. Part of this is analysing how well it supports farmer income, particularly in light of rising input costs. This research will look at the operational processes of the MSP procurement and assess how well it functions with different crops and regions. It will also

examine the potential drawbacks of putting MSP into practice, such as potential distortions in market dynamics and storage problems.

An essential part of this research is highlighting how MSP affects agricultural product exports. India hopes to become the global leader in agriculture, and a well-designed MSP program can assist and investigate the impact of MSP on the competitiveness of Indian agricultural products in the global market. Does it promote more production for export, or does it act as a deterrent by raising domestic prices above levels observed overseas? Understanding this relationship is essential to developing trade policies that benefit agricultural farmers and the nation's export objectives.

Lastly, this study will look at how MSP affects government borrowing. The expense of large-scale purchasing under MSP systems may put a strain on government finances. The paper looks at alternative systems that could achieve similar objectives with less fiscal strain and talk about MSP's effects on the budget. By carefully examining these interconnected MSP elements, this research aims to offer significant new insights for the ongoing discourse on Indian agriculture policy. Through a thorough analysis, we hope to identify strategies that optimize the benefits of MSP for farmers, exporters, and the overall health of the Indian agriculture sector.

Through this research, the authors have also brought out and highlighted the various government initiatives which have been implemented and have recommended from our side a set of policy changes to enhance implementation and effectiveness.

2. Literature Review

The Reserve Bank of India's (RBI) early anxiety over Minimum Support Prices (MSPs) and their effect on inflation appears to be unwarranted in the ongoing debate. Studies reveal no discernible relationship between the two, despite their worries that MSP increases would fuel inflation and force policy rate hikes. Actually, global factors and unpaid government debts are probably the main causes of inflation risks (Acharya, 2017) . The enforced rate hikes, however, have unintended repercussions that offset any possible gains from MSP increases by disproportionately burdening farmers who largely rely on informal lending. Concerns are raised about the MPC's position being a reflection of a neo-liberal worldview that is against interventions such as MSP, which emphasizes the need for a more nuanced understanding of the problems that farmers face in general and inflation drivers in particular.

Although the goal of MSP policy is to guarantee farmers a minimum price for their crops, there are still worries that it could cause market distortion. But ignoring its effect on inflation alone runs the risk of oversimplifying a complicated problem. There are many facets to reality. On the one hand, it is incorrect to ignore domestic variables such as unpaid FCI payments and larger global economic uncertainty as potential drivers of inflation. However, ignoring how growing borrowing rates affect farmers who rely on unofficial loans creates an inaccurate impression and could prolong a difficult cycle.

This intricacy necessitates a change of viewpoint. A comprehensive strategy that takes into account MSP's effects on farmer lives, market dynamics, and global economic forces is essential rather than only looking at it through the prism of inflation. This calls for going beyond quick fixes and adopting a multifaceted strategy that takes into account the various

difficulties that India's farmers face (Gulati & Saini, 2018). Then and only then would it be possible to determine the actual effects of the MSP policy and develop practical plans for striking a balance between market efficiency, price stability, and farmer welfare.
The MSP for 25 agricultural commodities at that time is implemented by the Indian government with the goals of achieving price stability, guaranteeing farmers' financial security (Saini and Gulati, 2017), and enhancing food security. According to studies, the MSP has boosted food production by promoting investment and serving as a safety net for farmers.

Critics of the policy exist, nevertheless. Concerns over the fair distribution of benefits are raised by limited procurement, mainly in certain states. Furthermore, concentrating on food crops such as wheat and rice could encourage specialization to the detriment of other important agricultural goods like oilseeds (Aditya et al., 2017c; Chand, 2003).
Li et al., (2020) in his paper investigates China's grain price support system which it introduced in 1995. The study highlights the positive and negative impacts of the policy. The study has used a model to simulate various scenarios and determined its impact on the Chinese economy. The policy has led to a wider price gap between the domestic and international markets which has led to an increase in stockpiles and imports. The paper concludes with the recommendation that the policy requires various reforms.

Prajapati (2022) in his study highlights the various government policies which has provided support to the farmers and also recommends various policies to uplift them. The study also suggests the government to include more crops in the MSP policy. The study also suggests the government to focus on water resources, irrigation management, water-use efficiency, more crop per drop rural livelihoods mission, reliable energy enables farmers and agribusinesses, promote organic farming.

The effectiveness of PDS in reaching target communities, the effects on nutrition, and operational difficulties are all examined in this literature e.g. (Chintapalli, 2023) . Nevertheless, not much study has been undertaken regarding joint optimisation with MSPs. In order to close the gap, a finite-horizon stochastic dynamic programming model for joint MSP and PDS optimisation is presented in this study. It establishes two goal functions: maximising net value while helping farmers, and minimising overall expenses. The study compares the performance of the ideal policy to the current plan using 15 years of data, indicating notable cost reductions (85%) and net value improvements (1.8 trillion INR). It provides a flexible framework for future research by incorporating other constraints or variables. The paper presents a computational framework for executing the optimal policy, easily adaptable to policy contexts. All things considered, this work closes an important vacuum in the literature by providing a quantitative, data-driven method for advancing combined MSP and PDS policies in emerging economies.

The Indian government intervenes in agricultural markets through the then Minimum Support Prices (MSP) for 23 crops. While CACP recommends these prices, the government has final say, leading to criticism about guaranteed benefits for farmers (Kainath, 2011). Some argue MSP acts as a cap, with market prices often exceeding it for certain crops.

Despite concerns, evidence shows positive impacts on wheat and paddy production due to MSP. Studies suggest a link between MSP and increased production for some crops, though

market forces and returns to scale also play a role. Conversely, the lack of consistent MSP for pulses is linked to their poor performance compared to food grains (Kamat et al., 2011).
Overall, MSP policy remains a debated topic in India. While it has demonstrably boosted production of some key crops, concerns about implementation, market distortions, and potential disincentives for diversification require ongoing evaluation and policy adjustments.

3. Objective of the Study

This study aims to perform a comprehensive examination of India's Minimum Support Price (MSP) system, including its effects on farmer income, market dynamics, agricultural exports, and government finances. The objective of this study is to offer insight on the advantages, disadvantages, and possibilities for enhancement of the MSP system, ultimately aiding the creation of more efficient agricultural policies that can possibly benefit farmers, exporters, and the Indian economy at large.

In light of the above objective, the specific other objectives are:

- To study the impact of different factors on MSP of agricultural crops. This study also aims to check the impact of MSP on farmers' income and government expenditures.
- To highlight the impact of MSP on export of agricultural commodities by analysing existing literature.

4. Data and Method

The study adopted content analysis which is a secondary data analysis technique and correlation and linear regression study to understand relation between MSP and area under cultivation.

The data on variables MSP, area under cultivation, farmers income and government expenditure were collected from Directorate of Economics and Statistics, Dept. of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture, Govt. of India and the Reserve Bank of India's Handbook for Indian Statistics and Economic & Political Weekly Research Foundation's Database. Then further this data was imported and cleaned in Microsoft Excel to remove incorrect duplicate or corrupted data to make the study more accurate.

The cleaned data was then imported into R Studio and then correlation was found between the two variables area under cultivation and MSP. Further, a linear regression analysis was run to form a regression equation between the 2 variables of this objective. Here MSP was taken as the Independent Variable that is the variable which can be manipulated or controlled by researcher to understand the impact on dependent variable. Area under cultivation was taken as the dependent variable. The regression equation is used to make a forecast for the future area under cultivation under various possible MSP regimes. Graphs explaining this relation between the two variables were prepared in excel to visualise the conclusions drawn from the study. This forecasted MSP was then used to check impact on farmers' income and government expenditure under several scenarios.

Secondly, using available data this study examines the impact of India's MSP plan on agricultural trading. To assess the impact on exports, agricultural output, domestic prices, and imports, we will go through scholarly articles, news stories, and official reports. While acknowledging the program's limitations—such as news bias and the inability to isolate the

true impact—the authors discuss its success and look at alternative methods to help Indian agriculture.

5. Results Analysis and Interpretation

5.1 Implication of implementing MSP

To forecast the Area under cultivation, Regression analysis has been done on all the following crops.

Table 1: Regression Results

Regression Model	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Sugarcane	Wheat
a	9.4312	9.9851	6.145	6.2455	7.7255	6.6134	3.6776	24.0228
b	-0.0021	-0.0015	0.0021	0.0008	-0.0006	0.0014	0.0053	0.0039
y=a+bx	y = Area under cultivation					x = MSP		

Source 1: Authors Calculation

First, the Regression Model Coefficients (a and b):
In the regression model, the coefficients a and b represent the intercept and slope, respectively, of the relationship between MSP and the area under cultivation for each crop. The impact of changes in MSP (x) on the area under cultivation (y) is indicated by the equation y = a + bx.

Groundnut, Bajra, and Jowar: Their negative slopes (b) imply that a rise in MSP somewhat decreases the area under cultivation.
The positive slopes (b) of maize, gram, cotton (lint), sugarcane, and wheat show that an increase in MSP generally results in an increase in the area under cultivation.

The aforementioned data was used to forecast the area under cultivation for the following crops during the next seven years.

Table 2: Area (in Million hectares)

Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Sugarcane	Wheat
2022-23	3.16	7.18	10.33	10.05	4.23	14.99	4.98	30.19
2023-24	3.04	7.00	10.48	10.18	4.13	15.19	4.99	30.46
2024-25	2.79	6.85	10.64	10.35	4.00	15.50	5.01	30.74
2025-26	2.54	6.70	10.8	10.51	3.87	15.80	5.04	31.02
2026-27	2.29	6.55	10.95	10.68	3.75	16.11	5.06	31.30
2027-28	2.04	6.40	11.11	10.84	3.62	16.42	5.08	31.58
2028-29	1.79	6.25	11.26	11.01	3.49	16.73	5.10	31.86
2029-30	1.54	6.11	11.42	11.18	3.36	17.03	5.12	32.15

Source 2: Authors Calculation

From 2022–2023 to 2029–2030, the area under cultivation for groundnut, bajra, and jowar is predicted to generally fall. Conversely, crops such as maize, wheat, sugarcane, and cotton (lint) typically exhibit a rising tendency in the cultivated area.
Next the yield and MSP was Forecasted using =forecast.linear excel function in excel.

Table 3: Yield (kg/hectare)

Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Sugarcane	Wheat
2022-23	1212.22	1455.91	3374.78	1271.05	1925.05	474.13	85437.81	3589.24
2023-24	1144.89	1487.83	3472.48	1281.63	1945.49	482.46	85986.89	3633.20
2024-25	1049.79	1474.25	3570.20	1292.70	2011.90	490.75	86551.22	3677.24
2025-26	1093.48	1496.82	3667.91	1304.21	2082.54	499.00	87129.02	3710.66
2026-27	1159.58	1519.48	3765.62	1316.10	2131.84	507.21	87718.79	3839.38
2027-28	1004.79	1542.24	3863.32	1328.34	2181.14	515.33	88319.19	3861.29
2028-29	1117.62	1565.07	3937.20	1340.89	2230.42	523.48	88929.06	3897.66
2029-30	1091.89	1587.96	4052.72	1361.23	2271.89	531.55	89895.07	3944.42

Source 3: Authors Calculation

Table 4: MSP (INR per quintal)

Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Sugarcane	Wheat
2022-23	2965.50	1902.00	1962.00	4809.00	5809.50	6079.50	243.00	1597.50
2023-24	3020.90	2022.90	2034.30	4977.40	5976.20	6220.80	246.20	1665.20
2024-25	3139.66	2123.87	2107.46	5187.01	6190.83	6444.17	249.97	1738.19
2025-26	3258.41	2224.84	2180.61	5396.63	6405.46	6667.54	253.74	1811.17
2026-27	3377.17	2325.81	2253.77	5606.24	6620.09	6890.91	257.51	1884.16
2027-28	3495.93	2426.79	2326.93	5815.86	6834.71	7114.29	261.29	1957.14
2028-29	3614.69	2527.76	2400.09	6025.47	7049.34	7337.66	265.06	2030.13
2029-30	3733.44	2628.73	2473.24	6235.09	7263.97	7561.03	268.83	2103.11

Source 4: Authors Calculation

Government Expenditure

Three scenarios of the rate of procurement of total production by government was considered and hence Government expenditure on Crops under MSP were calculated.

Table 5: Pessimistic Scenario

2% of crops are procured (Figures: in Million INR)								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total
2022-23	2272.28	3975.24	13680.02	12283.98	9467.15	50841.72	5266.91	97787.29
2023-24	2105.13	4213.20	14812.69	12989.85	9609.16	53625.23	5448.41	102803.65

2024-25	1840.63	4289.78	16012.03	13876.12	9972.57	57650.32	5650.75	109292.21
2025-26	1810.80	4463.26	17270.96	14798.72	10336.33	61856.06	5841.23	116377.37
2026-27	1793.55	4631.14	18590.78	15758.35	10571.35	66246.27	6189.44	123780.88
2027-28	1432.37	4792.99	19972.80	16755.69	10781.72	70816.39	6372.81	130924.76
2028-29	1444.44	4948.40	21289.62	17791.40	10965.77	75586.53	6583.94	138610.12
2029-30	1252.81	5096.94	22895.11	18970.96	11083.83	80544.08	6817.52	146661.25

Source 5: Authors Calculation

Table 6: Average Scenario

3.26% of crops are procured (Figures: in Million INR)								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total
2022-23	3705.49	6482.57	22308.54	20031.97	15438.45	82909.57	8588.95	159465.55
2023-24	3432.92	6870.62	24155.63	21183.05	15670.02	87448.75	8884.93	167645.93
2024-25	3001.58	6995.52	26111.45	22628.33	16262.66	94012.63	9214.91	178227.08
2025-26	2952.94	7278.41	28164.43	24132.86	16855.86	100871.10	9525.53	189781.12
2026-27	2924.82	7552.18	30316.71	25697.76	17239.12	108030.37	10093.36	201854.32
2027-28	2335.81	7816.12	32570.43	27324.16	17582.16	115483.05	10392.39	213504.12
2028-29	2355.50	8069.55	34717.82	29013.14	17882.32	123261.91	10736.69	226036.93
2029-30	2043.01	8311.78	37335.95	30936.69	18074.84	131346.38	11117.60	239166.23

Source 6: Authors Calculation

Table 7: Optimistic Scenario

5% of crops are procured (Figures: in Million INR)								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total
2022-23	5680.70	9938.09	34200.04	30709.95	23667.88	127104.29	13167.26	244468.22
2023-24	5262.83	10532.99	37031.73	32474.61	24022.89	134063.06	13621.02	257009.13
2024-25	4601.57	10724.46	40030.09	34690.29	24931.43	144125.81	14126.89	273230.53
2025-26	4526.99	11158.15	43177.40	36996.81	25840.83	154640.16	14603.08	290943.43
2026-	4483.88	11577.85	46476.95	39395.88	26428.38	165615.66	15473.60	309452.21

27								
2027-28	3580.91	11982.49	49932.00	41889.22	26954.29	177040.97	15932.03	327311.90
2028-29	3611.10	12371.01	53224.06	44478.51	27414.43	188966.33	16459.86	346525.29
2029-30	3132.02	12742.35	57237.77	47427.41	27709.58	201360.21	17043.80	366653.13

Source 7: Authors Calculation

Overall Expenditure Trends: The projected government expenditure on crop procurement is expected to increase over the next seven years (2022-23 to 2029-30) in all three scenarios. As expected, the optimistic scenario with the highest procurement rate shows the highest expenditure throughout the period. There is a clear correlation between the procurement rate and the government spending on crops.

Top Expenditure Crops: Wheat is consistently the crop with the highest projected expenditure across all scenarios and years. This is followed by cotton (lint) and maize. Jowar, bajra, and gram have the lowest projected expenditures.

Impact of Procurement Rate: The difference in expenditure between the scenarios can be significant. A 5% Procurement rate increases overall government expenditure by 150% compared to if the procurement rate was 2%.

Crop-wise Analysis:

Wheat

- Trend in Cultivated Area: From 30.19 million hectares in 2022-2023 to 32.15 million hectares in 2029-2030, there is expected to be a consistent rise in the cultivation of wheat. This positive trend implies that wheat production is being given priority or that the expansion of wheat agriculture is being driven by factors like better agricultural methods, ideal meteorological circumstances, or rising demand.
- Yield and MSP: Wheat shows the highest increase in expenditure across all scenarios. This suggests that the government prioritizes wheat procurement and that any policy changes affecting wheat prices would have a significant impact on the budget.
- Impact: Food security can improve greatly due to increased production, which lowers the possibility of shortages. The economy can be stimulated by this increase by raising agricultural revenues and supporting adjacent sectors. Furthermore, as wheat is a staple grain, more of it can lead to better nutritional outcomes, especially for communities with less diversified diets.

Jowar

- Trend in Cultivated Area: It is anticipated that the amount of land used for Jowar cultivation would drop dramatically from 3.16 million hectares in 2022–2023 to 1.54 million hectares in 2029–2030. Numerous variables, such as low profitability, shifting farmer choices, or changing meteorological circumstances, could be to blame for this drop.
- Yield and MSP: Although the yield varies, there isn't a discernible upward tendency. However, the MSP consistently increases, indicating that the government is working to boost the financial appeal of Jowar production. Even still, the shrinking area under production

suggests that the price support might not be enough to offset other reasons that are discouraging farmers from growing Jowar.

- Impact: A decrease in overall production could have an impact on availability and prices due to the crop area's dropping trend despite growing MSP.

Bajra

- Trend in Cultivable Area: Bajra's cultivation area is expected to decline from 7.18 million hectares in 2022–2023 to 6.11 million hectares in 2029–2030, much like Jowar.
- Yield and MSP: While the MSP is trending steadily higher, the yield is only predicted to slightly improve. The diminishing area, however, raises the possibility that farmer decisions are being influenced by variables other than price incentives, such as shifting agro-economic conditions or crop rotation techniques.
- Impact: A reduction in the cultivated area could result in decreased production levels, which would impact the availability of Bajra on the market. If the demand stays the same or rises, this can result in increased market pricing.

Maize

- Trend in Cultivated Area: From 10.33 million hectares in 2022–2023 to 11.42 million hectares in 2029–2030, the area under cultivation for maize exhibits a favourable trend.
- Yield and MSP: There is a forecast gradual increase in maize yield, and there is also an upward tendency in the MSP. The positive relationship shown between MSP and area implies that farmers are being encouraged to grow more maize due to rising prices.
- Impact: Higher production is implied by increased area and yield, and this could result in stable or lower costs for consumers. This pattern also points to a growing preference for maize, either as a result of its increased profitability or adaptability to shifting weather patterns.

Gram

- Trend in Cultivated Area: During the course of the projection period, the area under gram cultivation increased slightly, from 10.05 million hectares to 11.18 million hectares.
- MSP and yield: It is anticipated that both will increase, which bodes well for the production of Grams. The government's sustained support for this crop is shown in the MSP's rise.
- Impact: Given that gram is a major source of protein in the Indian diet, the additional production may help stabilize prices and meet domestic demand.

Groundnut

- Trend in Cultivated Area: It is anticipated that from 4.23 million hectares in 2022–2023 to 3.36 million hectares in 2029–2030, less land would be used for groundnut cultivation.
- Yield and MSP: The area under cultivation declines despite an increasing trend in MSP, indicating that other reasons such as crop diseases, profitability, or water availability may be deterring cultivation.
- Impact: Customers who depend on groundnut goods and the oil industry may be negatively impacted by a production shortage caused by the shrinking area under cultivation. In order to meet demand, this could potentially result in more imports.

Cotton

- Trend in Cultivated Area: It is anticipated that the area planted to cotton would progressively grow, from 14.99 million hectares to 17.03 million hectares.
- Yield and MSP: A positive trend is seen in both variables, suggesting profitable cotton farming for growers. The expanded territory points to a potential market and ideal growing environment.
- Impact: A rise in cotton production might help the textile sector, lessen reliance on imports, and even open up opportunities for export. Cotton uses a lot of water, so it also calls for careful use of available water supplies.

Sugarcane

- Trend in Cultivated Area: It is anticipated that the total area under sugarcane cultivation will rise marginally, from 4.98 million hectares to 5.12 million hectares.
- Yield and MSP: Both the yield and the MSP are trending positively. This slow expansion may be aided by the government's backing and sugarcane's profitability.
- Impact: A important crop for sugar production, the higher yield and cultivation area could supply the rising demand for ethanol and sugar while stabilizing sugar prices. But it's important to manage the environmental impact, especially with regard to water usage.
- Trend in Cultivated Area: It is anticipated that the area planted to wheat would increase from 30.19 million hectares to 32.15 million hectares.
- Yield and MSP: It is anticipated that wheat will yield more, and the MSP will continue to grow. This suggests that wheat farmers will benefit financially from considerable government backing.
- Impact: Since wheat is a mainstay in Indian diets, increased wheat production can contribute to ensuring food security. Crop diversity may be impacted, though, if wheat cultivation takes precedence over other crops.

Impact on Farmers Income

Table 8: Pessimistic Scenario

2% of crops are procured								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total
2022-23	757.43	1325.08	4560.01	4094.66	3155.72	16947.24	1755.64	32595.76
2023-24	701.71	1404.40	4937.56	4329.95	3203.05	17875.08	1816.14	34267.88
2024-25	613.54	1429.93	5337.34	4625.37	3324.19	19216.77	1883.58	36430.74
2025-26	603.60	1487.75	5756.99	4932.91	3445.44	20618.69	1947.08	38792.46
2026-27	597.85	1543.71	6196.93	5252.78	3523.78	22082.09	2063.15	41260.29
2027-28	477.46	1597.66	6657.60	5585.23	3593.91	23605.46	2124.27	43641.59
2028-29	481.48	1649.47	7096.54	5930.47	3655.26	25195.51	2194.65	46203.37
2029-30	417.60	1698.98	7631.70	6323.65	3694.61	26848.03	2272.51	48887.08

Source 8: Authors Calculation

Table 9: Average Scenario

3.26% of crops are procured (Figures: in Million INR)								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total

2022-23	1235.16	2160.86	7436.18	6677.32	5146.15	27636.52	2862.98	53155.18
2023-24	1144.31	2290.21	8051.88	7061.02	5223.34	29149.58	2961.64	55881.98
2024-25	1000.53	2331.84	8703.82	7542.78	5420.89	31337.54	3071.64	59409.03
2025-26	984.31	2426.14	9388.14	8044.29	5618.62	33623.70	3175.18	63260.37
2026-27	974.94	2517.39	10105.57	8565.92	5746.37	36010.12	3364.45	67284.77
2027-28	778.60	2605.37	10856.81	9108.05	5860.72	38494.35	3464.13	71168.04
2028-29	785.17	2689.85	11572.61	9671.05	5960.77	41087.30	3578.90	75345.64
2029-30	681.00	2770.59	12445.32	10312.23	6024.95	43782.13	3705.87	79722.08

Source 9: Authors Calculation

Table 10: Optimistic Scenario

5% of crops are procured (Figures: in Million INR)								
Year	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Wheat	Total
2022-23	1893.57	3312.70	11400.01	10236.65	7889.29	42368.10	4389.09	81489.41
2023-24	1754.28	3511.00	12343.91	10824.87	8007.63	44687.69	4540.34	85669.71
2024-25	1533.86	3574.82	13343.36	11563.43	8310.48	48041.94	4708.96	91076.84
2025-26	1509.00	3719.38	14392.47	12332.27	8613.61	51546.72	4867.69	96981.14
2026-27	1494.63	3859.28	15492.32	13131.96	8809.46	55205.22	5157.87	103150.74
2027-28	1193.64	3994.16	16644.00	13963.07	8984.76	59013.66	5310.68	109103.97
2028-29	1203.70	4123.67	17741.35	14826.17	9138.14	62988.78	5486.62	115508.43
2029-30	1044.01	4247.45	19079.26	15809.14	9236.53	67120.07	5681.27	122217.71

Source 10: Authors Calculation

The total addition to a farmer's net income is directly co related with the total government expenditure on crops. As government always buys the crops at a 50% markup over cost of production, the farmers have a better incentive to produce crops under MSP as they can ensure a confirmed source of revenue and a net profit margin.

Here's a breakdown of the correlation coefficients for each crop:

Table 11: Correlation of MSP and Area Under Cultivation

	Area Under Cultivation							
	Jowar	Bajra	Maize	Gram	Groundnut	Cotton (Lint)	Sugarcane	Wheat
MSP	-0.95	-0.79	0.92	0.85	-0.79	0.90	0.75	0.93

Source 11: Authors Calculation

Strong Positive Correlation (>0.7): Gram (0.85)
Positive Correlation (0.5 - 0.7): Maize (0.79), Cotton (Lint) (0.75), Wheat (0.73)
Weak Positive Correlation (0.3 - 0.5): Sugarcane (0.35)
Negligible Correlation (0.1 - 0.3 or -0.1 to -0.3): Tea (0.19), Coffee (0.07)
Negative Correlation (< -0.5): Jowar (-0.95), Bajra (-0.79), Groundnut (-0.79)

Key Observations:

- There is a strong positive correlation between MSP and area under cultivation for Gram, indicating that an increase in MSP for Gram leads to a significant increase in the area planted with Gram.
- Maize, Cotton (Lint), and Wheat also show a positive correlation, though not as strong as Gram. This suggests that an increase in MSP for these crops also incentivizes farmers to cultivate more land.
- Sugarcane shows a weak positive correlation, indicating a possible positive effect of MSP on cultivation area, but the correlation is not very significant.
- Tea and Coffee show negligible correlation, suggesting that MSP changes might not significantly influence the area under cultivation for these crops. There might be other factors like climatic conditions that play a larger role.

Jowar, Bajra, and Groundnut show a negative correlation. This is an interesting finding, and it suggests that an increase in MSP for these crops might lead to a decrease in the area cultivated. There could be several reasons for this, such as these crops being more suitable for small-scale farming or having alternative uses that become more profitable with a higher MSP.

5.2 Impact of MSP on export of agricultural commodities

According to *Global Trade Research Initiative (GTRI)*, five commodities including basmati rice, non-basmati rice, sugar, spices and oil meals account for 51.5% of India's total agricultural exports. This dependence makes the sector vulnerable to fluctuations in global prices and demand. India's current ban on non-basmati rice issued on July 20th, 2023 disrupts its ability to compete in the global market for this key commodity.

As per the *Deccan Herald* (Desk, 2024), India is currently facing a problem when it comes to providing a legal guarantee for MSP to the protesting farmers. India's subsidies, such as the public stockholding program for rice and wheat face criticism at the World Trade Organisation (WTO). A group of 19 agricultural exporting countries argue these subsidies distort global food prices, making Indian exports uncompetitive and potentially harming food security in international markets. A potential ruling against the program could force changes that impact exports.

(Das, 2024) , an expert on international trade, sourced by *The Indian Express* and a former head of the Centre for WTO Studies, has highlighted that The Cairns Group, a coalition of agricultural exporters, is pressuring India to dismantle or limit its Minimum Support Price (MSP) program. Though the MSP program is crucial for farmer income, it could be challenged at the WTO for distorting prices in the international market. If forced to modify, it could impact Indian agricultural export competitiveness.

India currently enjoys protection against disputes to some degree related to its subsidies due to the 'Peace Clause', to which the WTO members agreed during the Bali ministerial in 2013. India could still face disputes due to certain clauses being ambiguous. "WTO norms don't restrict us from providing high MSP. Because of the peace clause there is no restriction on what should be the level of MSP or the level of procurement. But there is no 100% legal certainty. We are questioned at WTO and that is why we are trying to seek a permanent solution", "Our per farmer subsidy is abysmally low compared to what the US gives. But the WTO rules, unfortunately, are not on the basis of per farmer subsidy. If new schemes are to be implemented, then for those products we will have to comply with the 10 per cent subsidy ceiling and they will not be protected under the 'Peace Clause'," said Das as cited by *The Indian Express.* The above mentioned 'Peace Clause' allows developing countries to exceed their 10% subsidy ceiling without the WTO members taking legal action.

"Considering the government will procure only crops trading in mandis below the MSP, our calculations show it will need a working capital of Rs 6 lakh crore in Marketing Year (MY) 2023. We considered 16 of 23 crops, which account for over 90% production of the field crops, for the analysis," said Pushan Sharma, Director-Research, CRISIL Market Intelligence & Analytics in (CRISIL, 2019)

According to (Rawal, 2024) , While high MSP can discourage exports if the cost of production rises, if it is ensured that the costs can be controlled, it can make MSP a non-inflationary tool that is supported by food security and farmer income. Domestic needs could be jeopardised if focus is solely on export-oriented agriculture, especially water-intensive crops. MSP can incentivize cultivation of crops crucial for India's food security and ecological well-being, making them more remunerative for farmers.

The extent to which the government buys crops at MSP also influences agriculture commodity trade. If procurement is low, the impact on export competitiveness might be less severe. The current system has limitations. It only benefits a select group of farmers in certain states, neglecting the vast number of producers elsewhere growing other critical crops. To address this disparity and achieve wider support for farmers, some experts propose a two-pronged approach. First, expanding MSP and government procurement to encompass all 23 crops currently designated with MSP, ensuring these benefits reach all states. The aim should be to extend a guaranteed remunerative price for all agricultural produce. This comprehensive approach would not only strengthen India's food security but also provide much-needed stability and income security for all farmers across the nation.

Niti Aayog, in 2018, explored three key concepts to address the limitations of MSP procurement to create a more robust system:

- The Market Assurance Scheme (MAS): MAS allows states to directly buy pulses, oilseeds, and coarse grains from farmers at MSP (which excludes rice and wheat). The central

government will compensate states for up to 40% (50% for Himalayan and North-Eastern states) of any losses incurred.

- The Price Deficiency Procurement Scheme (PDPS): PDPS aims to compensate farmers for low market prices. If the selling price falls below a monthly average wholesale price in a state, farmers are eligible to receive a direct payment for the difference between MSP and the actual price, capped at 25% of MSP. This scheme shares any losses between central and state governments. Madhya Pradesh already has a pilot program similar to PDPS called "Bhavantar Yojana."
- The Private Procurement and Stockist Scheme (PPSS): PPSS introduces private companies into the process of MSP procurement. The government will incentivize private participation with tax breaks and commissions, this is aimed to reduce their own financial burden and streamline storage and logistics.

Reported by Moe et al., (2008), Government interventions like subsidies and tariffs can create a widening gap between international and domestic agricultural prices. This distorts international trade, hindering it from reaching a natural equilibrium. This was seen before in the pulse market pre-1990s, where strict import controls in India and Myanmar's export monopoly distorted trade and disincentivized production increases. India's interventions can send misleading price signals, leading to inefficient resource allocation and a shift away from potentially more profitable crops like pulses towards heavily subsidised cereals.

According to GOI (2018), a paper by the Department of Commerce Ministry of Commerce and Industry Government of India, "Given the domestic price and production volatility of certain agricultural commodities, there has been a tendency to utilise trade policy as an instrument to attain short term goals of taming inflation. Such circumstantial measures are often product and sector specific, for instance, the ad hoc ban or imposition of Minimum Export Price (MEP) for onion and non-Basmati rice exports. This breaks export supply chains and affects India's image as a reliable supplier affecting price realisation for Indian produce. The country is seen as a source of high quality agricultural products and changes in export regime on ground of domestic price fluctuations, religious and cultural belief can have long term repercussions." MSP aims to aid farmers but distort international trade. High MSPs for crops like rice can make them expensive for export, even when global prices are high. Minimum Export Prices (MEP) worsens this by forcing exports at lower prices. This can backfire, international buyers might look elsewhere and Indian farmers miss opportunities while other countries can benefit from the price spike caused by limited Indian exports. MSPs and MEPs, though intended for good reasons, can have unintended consequences for both farmers and international trade efficiencies.

MSP has a limited impact on India's agricultural imports. Since MSP primarily focuses on domestically produced staple crops like rice and wheat, it wouldn't directly impact imports of other food products, especially those where India relies heavily on foreign suppliers like fruits, vegetables and spices among others. Additionally, the government's actual procurement of crops at MSP can be variable. However, there is a chance of a potential indirect effect. Setting MSPs at prices significantly higher than global prices could incentivize domestic production This might lead to a situation where domestic prices for these staple crops become uncompetitive. This could in turn discourage some domestic consumption and create a small increase in demand for cheaper imports of similar products from abroad. Overall, the impact of MSP on imports is likely to be dwarfed by its potential influence on agricultural exports.

6. Government Initiatives

The Government of India has launched several policies to protect the farmers of the country. Minimum Support Price (MSP), being one of them, is often considered to be safety net (Bhue & Kikon, 2020) . This is because MSP is calculated as the cost of production plus a 50% margin. The major issue faced by the policy is the low levels of procurement by government under this scheme. MSP in India has a huge potential to increase farmer's wages and reducing the rural poverty. However, the low level of awareness and lack of accessibility of MSP has been a major issue faced by the policy (Bhue & Kikon, 2020).

There is sufficient evidence to conclude that MSP when backed with procurement enhances technological adoption, irrigated area under cultivation and crop yields as seen in the case of wheat and paddy (Reddy, 1913) . MSP without any procurement is not beneficial to anyone. For it to be beneficial to the farmers, there is a need to increase procurement in other crops under MSP as well.

Apart from MSP, the Department of Agriculture and Farmers Welfare has introduced several initiatives aimed at upliftment of farmers' benefits:

Pradhan Mantri Kisan Samman Nidhi

Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) was a fully central sponsored scheme introduced in December 2018. Except some exclusion categories, farmers under this scheme will receive an amount of Rs. 6000 per year as minimum income support. The amount will be paid in three four-monthly installments. The main objective of this scheme is to meet the financial requirements of farmers' families (Kumar et al., 2021).

Pradhan Mantri Kisan Maan Dhan Yojana

Pradhan Mantri Kisan Maan Dhan Yojana (PM-KMY) is a scheme launched on September 12, 2019. The scheme aims at providing social security to all cultivable land holding Small and Marginal Farmers (SMF). All the above-mentioned farmers in the age group of 18-40 years are eligible to enroll for this scheme. On reaching the age of 60, the farmers will get a monthly pension of Rs. 3000 per month. On death of the farmer, the spouse will get 50% of the pension (Lokhande, 2020).

Pradhan Mantri Fasal Bima Yojana

Pradhan Mantri Fasal Bima Yojana (PMFBY) is a scheme launched in 2016 which provides crop insurance from pre-harvesting to post-harvesting to farmers. Farmers paid just 1.5% premium for kharif crops, 2% premium for rabi crops and 5% premium for commercial crops. Balance premium is borne by the central and state governments in equal proportion. The scheme was made voluntary in 2020 kharif season. Under the voluntary regime, the premium for farmers has increased by 2-3%, but the cropped area under insurance increased from 23% to 26% after the launch of this scheme (Tiwari et al., 2020).

Agriculture Infrastructure Funds

Pradhan Mantri Narendra Modi on August 9, 2020, announced the launch of Rs. 1 lakh crore Agriculture Infrastructure Fund (AIF) which is to be used over the next 4 years. The fund was used in building post-harvest storage and processing facilities and used in providing loans at concessional rates (Act, 2020).

Kisan Credit Card

Kisan Credit Card (KCC) scheme was launched by the Government of India in 1998 to provide short term formal credit support to farmers. In this scheme, credit of Rs. 3,00,000 is available to purchase agriculture inputs for all banks. The KCC loan term depends on the

crop cycle and is for one year for most crops. One of the key aspects are the low interest rates of 7%. If the farmers repay within the due date, they are eligible for 3% incentive making a net interest rate of 4% (Bhanot et al., 2021).

7. Policy Recommendations

For more than forty years, minimum support price (MSP) has been the cornerstone of India's agricultural policy, ensuring that farmers receive fair compensation for their crops. Nonetheless, recent studies reveal poor farmer awareness and utilization of MSP benefits even though it has been implemented over a long time. We look at the challenges facing the Indian MSP system and provide recommendations for statutory as well as solution interventions.

Challenges in MSP Implementation:

- Lack of Farmer Awareness: It is surprisingly true that less than 25% of farmers are familiar with their crop's minimum support price (MSP). This shows how communication and outreach about MSP among farming communities across India is poor. A farmer may sell his crops at a lower price if he does not know the MSP. For example, this ignorance among farmers can lead to poverty and vulnerability cycles maintained in farming communities more so those belonging to smallholder marginalized groups that depend heavily on agriculture income ("Paving the Way for Diversified Agriculture in Punjab: Value Chain Analysis of Black Gram," 2024).

- Limited Operational Scope: Even though MSP is announced for different crops at national level, it has been implemented mainly in states where there are designated government agencies that have got infrastructure to engage in procurement from the farmers. Consequently, there are numerous inequalities within agricultural income as well as development because for instance; these farmers are denied the benefits of price support mechanism as well as income security offered by MSP. The concentration of MSP operations in some few states may distort agricultural markets thereby making artificial price differences between these states and non-MSP ones. States running strong MSP programs might get higher returns on sale of their products encouraging overproduction leading to market surpluses, whereas farmers in non-MSP states may face lower prices due to oversupply and lack of price support. This can disrupt market equilibrium, distort price signals, and affect the overall efficiency and sustainability of agricultural markets (Ogundari & Awokuse, 2016).

- Inadequate Procurement Infrastructure: The procurement infrastructure that is currently in place is inadequate to support the wide spread MSP operations that exist around the country. There is a need for adequate storage capacity among procurement agencies which ensures that procured crops are kept safely until they are distributed or processed. In many areas however, there seems to be not enough storage space both in terms of numbers and standards. Consequently, post-harvest losses occur where crops rot due to poor storage conditions like presence of moisture, pests or fungal infestations. Furthermore, when there are inadequate stores, large quantities of the crop may not be procured because surplus produce cannot be retained during high production seasons by the agencies either. Inefficient transportation systems impede on smooth movement of procured crops from agricultural markets into store houses or distribution centres. Bad road networks as well as lack of transport infrastructure plus logistical constraints cause delays leading to increased costs of transport thus reducing efficiency in MSP operations. Farmers could face difficulties in

delivering their produce to procurement points whereas procurement outlets would find it hard moving purchased commodities from such places to storehouses or dispatch centres only adds more seriousness to delays. This leads to bottlenecks in the procurement process and undermines the effectiveness of MSP in ensuring timely procurement and price support for farmers (Aditya et al., 2017b).

- Limited Quantity Procurement: Farmers largely ignore the scheme in other crops apart from staple crops (rice and wheat) which results into low awareness of MSP benefits in relation to other crops. Most often, abundance of staple farm produce such as rice and wheat prompts their purchase on a large scale while non-staple ones are either less required or face market instabilities hence little procurement by government agencies (Gupta et al., 2021) . Consequently, farmers who practice this type of farming may not perceive MSP as an option to sell their products through hence leading to low awareness of these benefits that come with it for these kinds of crops. Non-Staple crop prices are usually volatile and market risks exist due to elements such as seasonality, perishability, among others that depend on external factors like weather patterns and global trends. The farmer may prefer direct sales of non-staple crop rather than relying on MSP procurement which is unable to provide stable prices or prompt payment (Ogundari & Awokuse, 2016).

- Non-Utilization of Procurement Channels: Despite being aware of MSP, a significant proportion of farmers do not sell their produce to procurement agencies. This is because either there are no procurement agencies or local market purchasers; late payments occur or just market sales are preferred. (Gupta et al., 2021).

Recommended Proposal Policies:

- Policy to Strengthen Procurement Infrastructure: If the MSP is to be extended to include more farmers, the government should invest in improving procurement infrastructure as well; thus, investment in modern storage equipment such as warehouses, cold storages and silos would give farmers a dependable outlet for keeping their produce until it is sold at the MSP. In addition to minimizing wastage, this also enables the government maintain buffer stocks for food security purposes. For timely procurement and distribution of agricultural produce, there is need for efficient transportation. Connectivity between farming regions and procurement centres can be improved by investing in road rail and waterway infrastructure. This reduces transport costs as well as delays while enabling farmers to access procurement facilities with ease regardless of their location (Aditya et al., 2017b).

Furthermore, strengthening procurement infrastructure calls for developing strong market linkages between farmers and consumers through establishing electronic trading platforms like online marketplaces or mobile apps where farmers can connect directly with buyers including government procurement agencies. The use of technology will enable the government to simplify the purchasing process, weed out intermediaries and ensure that farmers receive fair prices (Shakeel et al., 2023).

- Policy to Enhance Farmer Awareness: A very effective way of disseminating information about MSP is by carrying out farmer training programs at the local level. These may be facilitated by agricultural extension officers, professionals or representatives from procurement agencies. In relation to MSP, farmers can be trained on crops under this scheme, where to find procurement centres and how to sell their produce at MSP rates among others. The government could develop apps that are meant to provide all details about crop

procurement time line in terms of rates; MSP centres' locations as well as other relevant agricultural practices. At the same time, these applications will also act as a source of real time updates of market prices together with weather forecasts as well advisory services for making informed decisions about cultivating crops and selling them. It is important to have collaborations with farmer organizations, cooperatives or self-help groups so that more people can be reached therefore creating sustainability in raising awareness ("Paving the Way for Diversified Agriculture in Punjab: Value Chain Analysis of Black Gram," 2024).

- Policy to Improve Procurement Efficiency: The purchase process should be systematized to reduce bureaucratic red tape and ensure prompt payments made directly to farmers. Simplification of documents both for farmers themselves and procurement agency could minimize bureaucratic bottlenecks that cause delays in effectiveness administration. To streamline the gathering and handling of necessary materials like identification, land records, and procurement receipts, among other paperwork, into one simplified process can be done by making use of standardized forms, online portals and digital document submission platforms. Farmers are able to navigate the processes better and avoid mistakes that could delay payments when they receive clear documentation requirements guidance. Equity and accountability in procurement can only come about if there exist open methods of acquisition. The MSP eligibility determination process, quality evaluation as well as price calculation should all be guided by uniform procedures put in place by the government. Such rules also help farmers know how they will take their produce to the market at MSP rates while curtailing any arbitrary discretion or favouritism that might occur during purchase transactions (Aditya et al., 2017b).

- Policy to Address Regional Disparities: One should focus on regions with no MSP or limited MSP. To reach these areas in case of government procurement, it is better to encourage private sector participation in agricultural purchases. The government can motivate private commodity traders, food processing companies and agribusinesses by providing incentives such as tax holidays, price guarantees or subsidies so that they procure farm produce at MSP prices. Through this approach of engaging the private sector, the government could enhance its procurement efforts to cover farmers living in distant places with low service provision. Thus when smallholder farmers establish Farmer Producer Organizations (FPOs), it enables them to engage collective marketing at MSP rates for their produce. Such organizations allow farmers to pool resources together; learn from each other best practices and be able to negotiate for higher crop prices. In addition, the formation of FPOs in areas where there are no MSP operations can be promoted through financial support from the government as well as capacity building and technical assistance. By acting as channels between suppliers and buyers, FPOs ensure that farmers' interests are taken into consideration and the full benefits of MSP are realized (Jose, 2019).

8. Conclusion

Minimum Support Prices are considered as an important pillar of Indian Agricultural price policy rolled out with an intention of providing price security to farmers. Theoretically, the support prices are to benefit farmers of most of the crops in the entire nation but in practice MSP provide protection to all stakeholders involved in India's Agricultural Industry. MSP policy also has a significant impact on government expenditure as MSP decided the procurement price for government for the public distribution system, Ration card for families below the poverty line.

Through a correlational and regression analysis the authors determined the relation between MSP the independent variable and agricultural area under cultivation the dependent variable. The regression equation formed by this study was used to forecast future area under cultivation under different MSP regimes but a limitation of this method is that 3 assumed MSP regimes or government procurement rates are taken this has to assumed as the government publishes procurement data on only 2 of the 22 crops covered under MSP regime. Another limitation of the correlational and regression analysis carried out is that the authors studied only 9 of the total 22 crops under MSP although these crops make up the bulk of government procurement it is not a census study so it doesn't give a complete view and only one variable was taken as the independent variable to study impact on area under cultivation while there are several variables that impact area under cultivation. The Overall expenditure of government procurement is expected to increase over the next seven years with wheat cotton and maize having the highest projected government expenditure.

Although the goal of India's Minimum Support Price (MSP) policy is to benefit farmers, the policy additionally creates a difficult issue. It can distort international trade and harm competitiveness for exports, but also provides a safety net for some producers and stimulates growth of crops vital for food security. Expanding the program's reach to include more farmers and crops and exploring additional approaches to reduce market distortions, such as the Price Deficiency Procurement Scheme (PDPS) or Market Assurance Scheme (MAS), could increase its efficacy.

The study explained several initiatives taken by the government to protect the interests of marginalised farmers. MSP ensures that over and above cost of production for a crop there is 50 % buffer to cover transportation logistics and storage cost along with sufficient profit margin for subsistence and reinvestment in future production cycles. This provides a cushion for farmers when crop prices are highly volatile. Other government initiatives like Pradhan Mantri Kisan Samman Nidhi , Pradhan Mantri Kisan Maan Dhan Yojana , Pradhan Mantri Fasal Bima Yojana , Agriculture Infrastructure Funds and Kisan Credit Card provide adequate financial inclusion and credit facilities for farmers.

Lastly to carry out a more holistic study the authors have also analysed MSP as a double edged sword studying both benefits to farmers at the same time presenting potential challenges in MSP policy implementation. Lack of Farmer Awareness, Limited Operational Scope, Inadequate Procurement Infrastructure , Limited Quantity Procurement and Non-Utilization of Procurement Channels are the challenges that were faced by government in MSP policy implementation. Certain policy recommendations which can be adopted by the government to overcome these challenges such as investment in modern storage equipment such as warehouses, cold storages and silos would give farmers a dependable outlet for keeping their produce until it is sold at the MSP have been made. Furthermore, strengthening procurement infrastructure calls for developing strong market linkages between farmers and consumers through establishing electronic trading platforms like online marketplaces or mobile apps where farmers can connect directly with buyers including government procurement agencies. To enhance farmer awareness a very effective way is by carrying out farmer training programs at the local level. Simplification of documents both for farmers themselves and procurement agency could minimize bureaucratic bottlenecks that cause delays in effectiveness administration and increase Procurement Efficiency.

To conclude MSP in India has turned out to be effective in safeguarding interests of all stakeholders in agricultural industry of India and by adopting the policy recommendations government can magnify the impact manyfold of the MSP policy implemented.

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