International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

The Environmental Implications of Minimum Support Prices in India

Aryan Arjun

Canadian International School Bangalore

DOI: 10.46609/IJSSER.2025.v10i07.026 URL: https://doi.org/10.46609/IJSSER.2025.v10i07.026

Received: 11 July 2025 / Accepted: 27 July 2025 / Published: 30 July 2025

ABSTRACT

India's Green Revolution involved the widespread adoption of high-yielding crop varieties, chemical fertilizers, and irrigation technologies to rapidly increase food production and achieve self-sufficiency. The increasing production of agricultural crops driven by the Green Revolution also led to the implementation of Minimum Support Prices to protect farmer interests. India is an agrarian economy where agriculture supports the livelihoods of a significant portion of the population, hence, the reliance of farmers on the minimum support price has encouraged large-scale overproduction of select crops. Thus, this review aims to identify and expound the key consequences on the environment when a minimum support price is implemented on certain crops. This will help policymakers and producers evaluate their current agricultural practices and continue with more sustainable and efficient approaches to production. The paper includes a detailed and thorough literature review that synthesises existing studies on environmental impacts due to agricultural supply-side policies. Logical economic theory will work in tandem with microeconomic diagrams to draw reasoned conclusions throughout the paper. This paper hypothesizes that Minimum Support Prices incentivise production practices that are detrimental to the environment. The hypothesis will be tested by analysing relevant datasets and incorporating qualitative insights gathered through interviews with farmers directly affected by the Minimum Support Price regime.

Introduction

The 1960's Green Revolution in India spearheaded the introduction of Minimum Support Prices (MSP). The Green Revolution was a period of rapid agricultural expansion, marked by the adoption of chemical fertilisers and new irrigation methods. The mandated prices being discussed in this paper, were introduced among other laws to stimulate agricultural production within the Indian economy and reduce India's reliance on external trade partners for food, thereby ensuring food security (Chakraborty et al., 2024). Normally, the MSP is applied to crops that are essential in Indian households, such as rice and barley (Chachei, 2024). The MSP regime

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

stimulates production, according to economic analysis carried out by Harsana et al. However, the MSP inadvertently encourages over-production, putting extreme pressure on the government to purchase the surplus, while giving farmers incentive to incessantly produce (Das, 2020). In this paper, by examining various case studies, I evaluate a critical and often overlooked dimension of MSPs, which is their impact on the environment. Specifically, this research investigates whether the MSP has become an environmental liability. Several studies suggest that MSPs have led to excessive cultivation of water-intensive crops, such as paddy, particularly in ecologically sensitive regions like Punjab and Haryana (Kumar & Kori, 2024). Encouraged by government procurement guarantees, farmers are incentivized to produce beyond sustainable levels, leading to soil degradation, groundwater depletion, and a growing dependence on chemical fertilizers and pesticides (Sinha et al., 2022). This paper aims to substantiate existing research, utilising both quantitative as well as qualitative methods of data analysis. Through the data analysis, we examine how farmers often overlook ecological factors due to a higher price, showing the negative consequences that occur when a high MSP exists. In addition, the extreme difference between the production of MSP and non-MSP crops implies overproduction due to a high MSP. By critically examining the trade-offs between agricultural policies and environmental sustainability, this paper's findings may offer valuable insights for policymakers aiming to balance economic objectives with long-term ecological resilience.

Background

A minimum support price (MSP) is a government mandated price that must be paid for a certain crop. The MSP provides farmers with a guaranteed price for their produce. By instituting a price floor, the farmer is assured of a minimum price for their crops. This goes on to ensure that the producer receives a stable income. There are a total of 22 crops upon which the Indian government imposes an MSP. These include staples that are essential in Indian households, such as rice and wheat as well as pulses and oilseeds. 27.8% of India's total agricultural produce is subject to the MSP, with 10% of the agricultural households benefiting from this guaranteed price (Harsana et al., 2024). A MSP is set by the government per quintal (100 kilograms) of a specific crop produced (Das, 2020).

The implementation of a MSP is mostly undertaken by the central government. First, the MSP is recommended by the Commission for Agricultural Costs and Prices (CACP) to the central government (Das, 2020). The CACP considers multiple factors when determining MSPs, including the cost of production, changes in input prices, demand and supply conditions, inter-crop price parity, price trends in domestic and international markets, and the likely impact on inflation and resource use efficiency (Janna et al., 2024). This recommendation is thoroughly reviewed by the union minister of agriculture and sent to the Cabinet Committee on Economic Affairs (CCEA) for final approval. The CCEA, chaired by the Prime Minister of India, is

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

responsible for authorizing the official MSP rates. Once approved, these rates are implemented through coordination between the Food Corporation of India (FCI) and respective state governments (Janna et al., 2024). The MSP applies to over 20 essential agricultural commodities and is updated and announced biannually, once before each sowing season.

The Food Corporation of India generally purchases unsold crops from farmers at the MSP that is set; in 2023, they purchased 20% of India's total agricultural output[1]. By purchasing unsold crops, the Food Corporation of India reduces the uncertainty that arises from food insecurity, while setting aside enough produce that can be exported to positively impact the balance of trade. However, while the procurement of essential commodities by the Food Corporation of India is substantial, other produce such as oilseeds tend to be ignored (Chakraborty et al., 2024). The crops that are not purchased by the Food Corporation of India for the country, will be purchased by the state governments (Das, 2020), this purchased produce will contribute to local stockpiles or be transported to different states that lack the capacity to produce these crops on their own.

The motivation behind implementing an MSP stems from the need to protect India's most vulnerable group, farmers, from price fluctuations. In India, farmers are one of the main stakeholders in the economy, making up most of the primary sector, with 48.9% of the Indian population contributing to the primary sector. The MSP acts as a safety net for them, its main goal being to ensure that farmers have steady income. This helps curb farmer protests and demonstrations. It is important to note that the production of MSP crops has always been substantially higher than the production of non-MSP crops, primarily due to their essential nature (e.g. rice, wheat), moreover, the MSP acts as a catalyst for their production. In addition to this, MSPs are in place to help reduce exploitation of farmers by large corporations, by ensuring that farmers receive a fair and guaranteed price for their products, the MSP helps provide an above average return on investment for the 22 MSP crops, relative to other crops, thereby improving farmer livelihoods while contributing to rising rural development (Harsana et al., 2024).

Another factor that drove the government to implement an MSP, was the need to ensure food security. In the early 1960's, India imported most of its agricultural produce from the United States, this led to inherent vulnerability and extreme food insecurity. Before the Green Revolution, the Public Law 480 (PL-480) program was used to import over 10 million tonnes of grain from the United States in 1966 (FAO, World Bank). To ensure that more produce was being produced in the country and avoid external shocks, the Indian government helped spur the Green Revolution, wherein the vital role of the MSP cannot be ignored. The Green Revolution helped increase self sufficiency and reduce external dependence. During this period, the

[1] Report of the Comptroller and Auditor General of India on Storage Management and Movement of Food grains by Food Corporation of India

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

government launched multiple schemes to stimulate production of agricultural produce within the economy. These schemes were largely successful, with agricultural imports reaching record lows less than 2 years after the policies were implemented. To protect domestic consumers from external influences or shocks, the MSP ensures that farmers have high incentives to produce crops, curbing food insecurity while guaranteeing a surplus.

While there are numerous positives to the utilization of a minimum support price, it is important to note that when prices are set beyond the natural equilibrium prices, farmers are incentivized to produce more crops than they would otherwise. While farmers are acting rationally in order to maximise their profits, they often tend to overlook the external costs that arise from the increased production of MSP goods, one of which is ecological degradation. As farmers do not bear the full societal cost of environmental damage caused by surplus production of MSP crops, and actually receive payment for producing, they will produce as much as they can afford to, regardless of the consequences on the environment (Harsana et al., 2024). This leads to a negative externality of production for MSP crops, wherein the cost to society is higher than the cost to individual farmers. This negative externality suggests that the good is being overproduced, and society suffers as a result of its production, making it in society's best interests to produce less of these goods. This research paper aims to identify and evaluate the environmental impacts of a minimum support price. In order to do this, the paper utilises economic theory to identify the welfare loss caused by the policy; conducts a literature review of existing research that quantitatively examines the impact of agricultural policies on the environment; and conducts original quantitative and qualitative data analyses. This paper assumes the view that the imposition of a minimum support price leads to negative consequences for the environment.

Economic Theory behind the Indian MSP

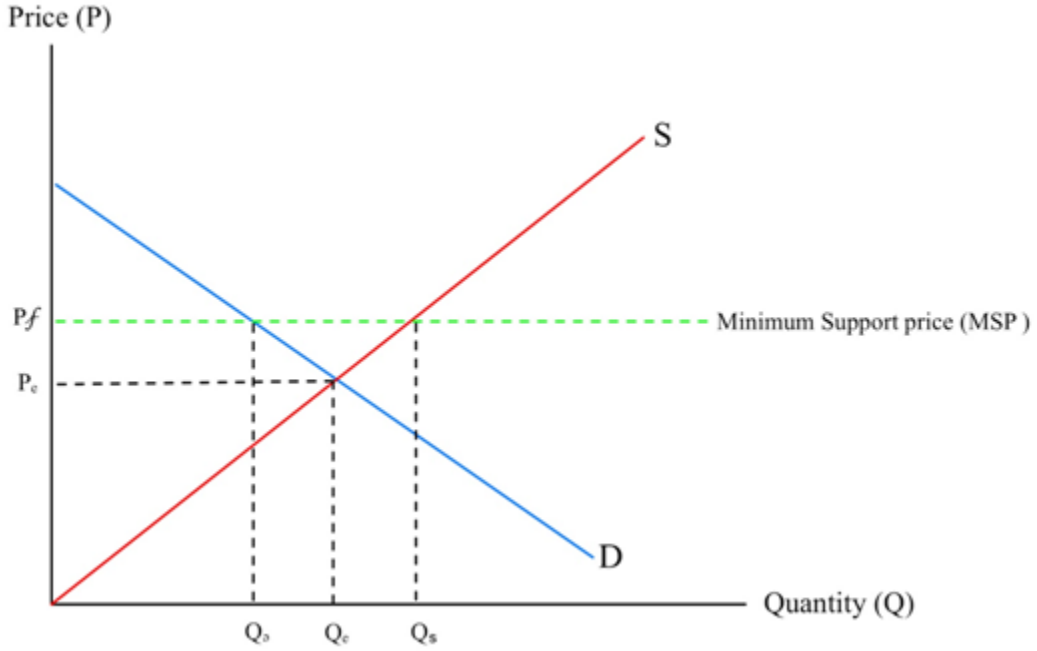
This section of the paper uses economic theory to explain how the imposition of a Minimum Support Price (MSP) distorts market equilibrium, leading to allocative and productive inefficiencies, and ultimately, welfare loss. By analyzing the impact of a price floor through demand and supply diagrams, this section establishes how MSPs result in a misallocation of resources, encouraging overproduction. Here, it will be simple to see how core microeconomic concepts are integrated with the broader environmental critique of the MSP system.

Figure 1 illustrates the imposition of a MSP, represented as P_f on the diagram. Here, the price floor is set higher than the equilibrium price, this effectively mandates a set price (P_f) for the produce, thereby taking care of producer interests. As a result of the mandated price, the new MSP price is significantly higher than the equilibrium price, represented as P_e.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Figure 1: The Imposition of a Price Floor

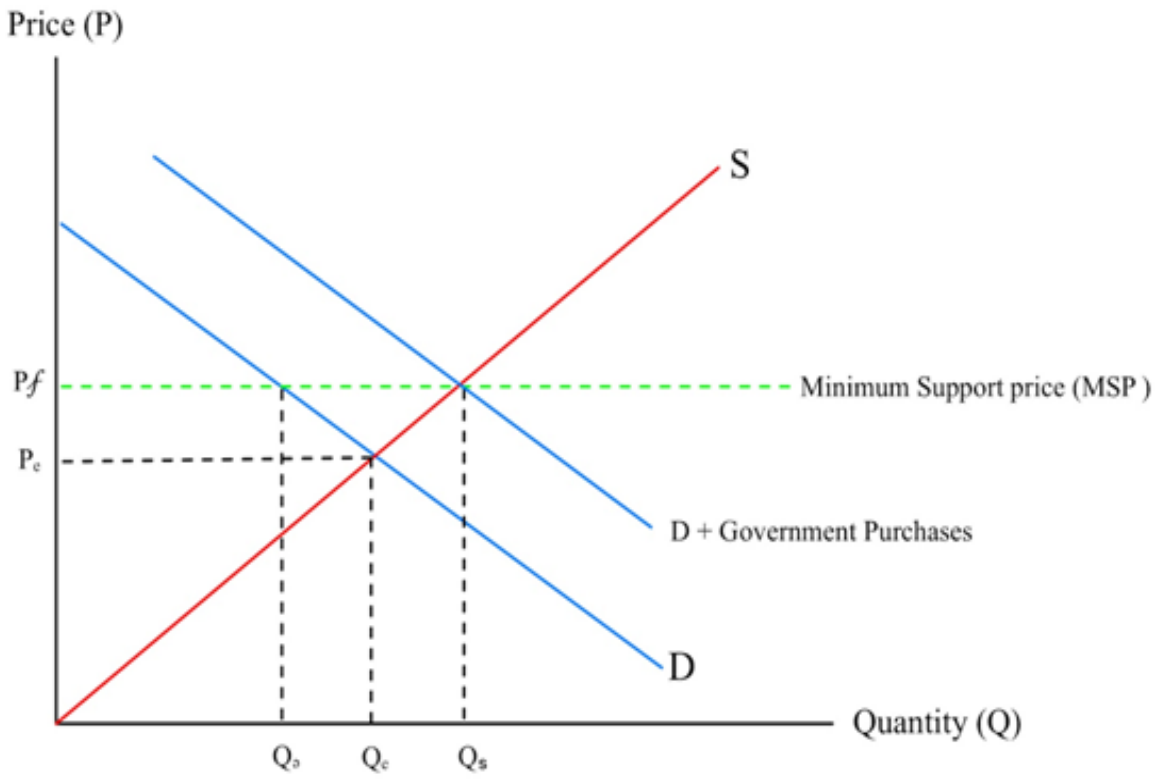


In the above diagram, Q_d, represents quantity demanded, which is the price consumers are willing and able to spend on the purchase of crops after the imposition of the minimum support price. In line with the law of demand, as price rises, demand falls, this is represented here as quantity that is demanded contracts from Q_e to Q_d, this new Q_d is far lower than the original equilibrium quantity, which is represented as Q_e on this graph. This illustrates the fact that consumers are now less willing to purchase the good due to its higher mandated price. The quantity of the good consumers purchase at P_f is significantly lower than the quantity they purchase at P_e. According to the law of supply, as the price of a good rises, the quantity supplied of that good will increase, here, as the price of produce rises, farmers will be more willing and able to produce it. This creates an extension in the supply of the good from Q_e, the producers now supply a larger quantity of the good shown as Q_s. The difference between Q_d and Q_s represents the surplus of the produce. As the price may be too high for some consumers, they will forgo their spending on the good, leaving the supplier with lost consumers and unsold produce. This surplus represents an over-allocation of resources towards the MSP goods, this is because the producers are responding to the artificially high price by ramping up their production, this production is not in line with the demand, the creation of a surplus leaves the market in disequilibrium. Thus, more resources are directed towards producing the crop than is efficient or necessary, simply because producers want to take advantage of the higher price that has been mandated.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Figure 2: Price Floor + Government Purchases



In figure 2, a price floor is set above the minimum price, resulting in a surplus, suggesting that the market is in disequilibrium. In India, the government generally buys up all of the unsold produce, farmers are therefore guaranteed income for the goods that they have produced. The government buys all of these goods at the minimum price. This ensures that the farmers do not supply the goods to the market at a lower price, due to increasing downward pressure on the price of produce as a result of the surplus. Farmers do not have an incentive to sell their goods at a price lower than the price floor, simply because the government is purchasing and ensuring that they receive the MSP for their produce.

As a result of government expenditure for the produce, the demand curve will shift to the right. The government feels an increasing need to purchase the surplus to ensure that the minimum price does not fluctuate, thereby providing a stable market for Indian agricultural produce and by extension, a stable income for farmers. The increasing demand that shifts the demand curve rightward artificially increases demand, but this increase in demand is not due to consumer preference. This raises the important question of whether consumers are actually better off due to the implementation of a minimum support price on agricultural produce.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Figure 3: Areas of Producer and Consumer Surplus at Equilibrium

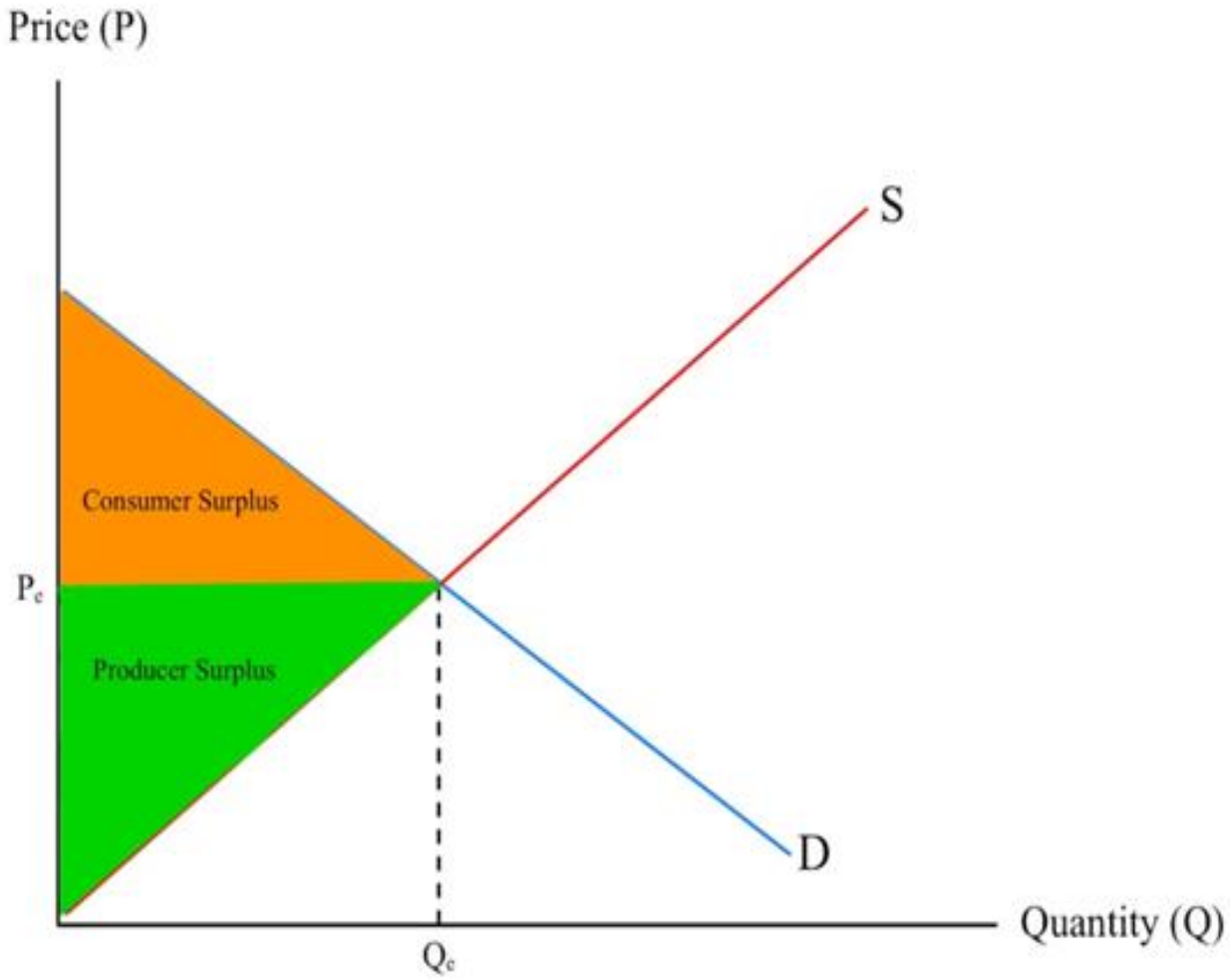
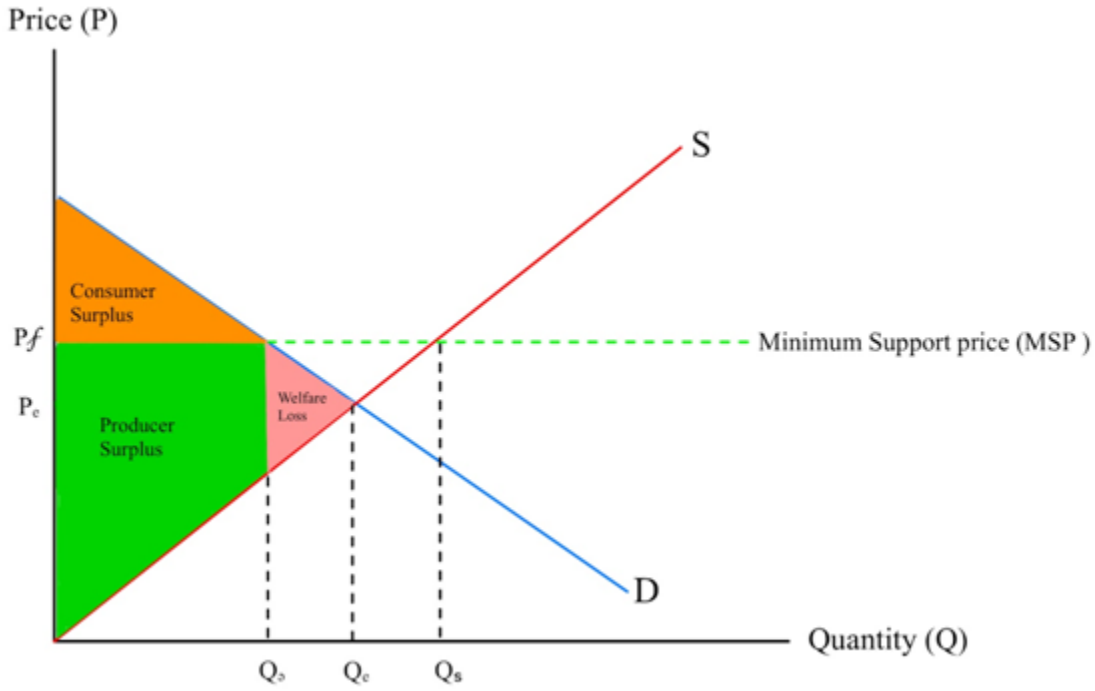


Figure 3 is a rudimentary demand and supply curve illustrating social surplus. The consumer surplus is represented as the orange triangle, above the equilibrium price and below the demand curve. The consumer surplus is the difference between what the consumer is willing to pay for the good, and what they actually pay for the good. Here, consumer surplus is maximised. Producer surplus is represented here as the green triangle, producer surplus is beneath the price, within the supply curve. The producer surplus is simply the difference between what the producer is willing to supply the good at, and what they actually sell the good for. Producer and consumer surplus are maximised in the free market, assuming that the market is in perfect competition, thus, social surplus is maximised. Social surplus is the sum of consumer and producer surplus. It is important to note that this type of social surplus maximisation only exists in a perfectly competitive market.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Figure 4: Areas of Producer and Consumer Surplus after the imposition of an MSP



In Figure 4, there is a new price that is fixed for the good, which is the MSP in this case. As the price of a good rises, the consumer surplus that is present tends to decrease. Here, due to the higher price for agricultural produce, consumer surplus is slashed as there is a smaller difference between the price they want to pay for the good and the price they actually pay for it. However, as consumers lose surplus, producers gain it. Producer surplus has increased substantially due to the mandated MSP, here, there is a greater difference between what producers are willing to sell their produce for and what they actually sell their goods for. The equilibrium price was lower, and thus the producer surplus was lower than what it is now, but due to the mandated higher price, consumers are less willing and able to buy the good, leading to lost consumer surplus, while producers are more inclined toward producing the good due to the increased price, leading to increasing producer surplus. Thus, the consumer loses surplus to the producer as a result of a higher mandated price.

However, while there are both gains and losses in overall surplus, deadweight loss is present. As there is now a higher market price for the good, certain consumers are unable to purchase it due to the higher price, this leads to a reduction in consumer surplus and an increase in welfare loss.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

In addition, while the producer will receive increased revenues from the units that they could have sold at the equilibrium price, they must endure permanently lost profits due to the fewer consumers who are purchasing their produce, thereby adding to the welfare loss. There is deadweight loss that ensues, this occurs as a price floor creates a loss of mutually beneficial trades that no longer happen because the price is kept artificially high. While some producers gain from the higher price, the total loss in consumer surplus and the value of the foregone trades outweigh this gain, leading to an overall loss of welfare.

In addition to the welfare loss, a minimum price distorts productive efficiency. Productive efficiency occurs when goods are produced at the lowest possible cost. In this case, by setting an artificially high price for produce, the Indian government does not put any pressure on farmers to reduce their costs. The lack of incentive to innovate or produce in an efficient manner could lead to higher production costs for the producer, which in turn lead to inefficiencies.

Additionally, allocative inefficiency occurs due to the imposition of this minimum price. Allocative efficiency occurs only when resources are allocated in a manner that maximises overall social welfare, meaning that the cost of producing each additional unit of the good or service is equal to the benefit that consumers receive from consuming each additional unit of a good or a service. This means that the marginal cost of producing each extra unit of a good or service, is equal to the marginal benefit derived from the consumption of each additional unit of the good or service. In this particular scenario, producers supply more than the consumer's demand due to a higher price, leading to a surplus being present in the market. As explored above, the higher price effectively excludes certain consumers from the purchase of the agricultural produce since they cannot afford to buy it, this leaves a surplus that only the government can afford to take off the market. The surplus also suggests that the producers are producing crops that consumers do not value as much, which is why they choose not to buy it and forgo their consumption. Thus, producers would have been able to produce other goods that would satisfy consumer interests, making the trades in the market allocatively efficient. However, the minimum price distorts this notion, effectively subverting social welfare by offing a higher price that is attractive to farmers. This goes on to force them to act rationally and produce to keep them in a financially viable position, even if other crops would be valued more by society.

Due to the existing productive inefficiency when a minimum price is imposed, wastage and unused produce will be present, raising questions about the sustainability of the government purchasing all of the surplus. In addition, the extreme amount of production as a result of heightened incentive to do so, is detrimental to the environment due to the incessant production of crops, this idea will be explored later in the research paper.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Furthermore, consumer choice is negatively affected by the implementation of a MSP. There will always be a surplus of the 22 MSP crops that will be ever-present in the market due to the incentive to produce. As farmers employ monoculture farming to produce a single crop, they may divert resources from other crops to increase the yield of this particular crop. By doing so, there will be lower production of the crops that are not under the banner of an MSP, this effectively constricts consumer choice in India, as only a select handful of crops are under the MSP regime (Kumar, Kori, 2024).

Theoretical Framework

1) Loss of natural groundwater due to the MSP

When an MSP is introduced, it inherently impacts the amount of the crop suppliers are willing and able to sell. By increasing the price of a few crops, it makes those particular crops attractive to produce simply because farmers have an increased incentive to do so (Ali, Sidhu and Vatta, 2012). There are 22 crops that the MSP has affected, some of these crops are native to different regions of India, and because they have an MSP implemented on them, farmers produce them in non-native environments, to help maximise their profits. In Haryana, the overproduction of water-intensive crops such as rice and sugarcane have resulted in unsustainable extraction of water. These crops require plenty of water, which Haryana's dry climate cannot provide, and thus, farmers try to produce them by utilising water from either wells or groundwater sources. These actions have proven to be catastrophic, as Haryana produces a large percentage of water dependent agricultural produce (Sinha, Michalak, Balaji, 2022). As per 2024, the groundwater extraction of Haryana is 137% of its annual groundwater extractable resources, simply because farmers are building wells and overusing their resources in order to model an environment where non-native crops thrive (Sinha, Michalak, Balaji, 2022). This over extraction of groundwater in an unsustainable manner has propelled Haryana to a red-level category of exploitation; out of 141 blocks (water sources) in Haryana, 85 blocks have reached the red line. As over 50% of the water sources have been overexploited, the government of Haryana is desperately trying to incentivise farmers to produce crops that are native to the region, thereby alleviating the burden on the quickly diminishing water supply (Kumar, Kori, 2024). However, as most native crops of Haryana are unlikely to command the high minimum price, it is unlikely that the shift will occur in a timely manner. Furthermore, as large amounts of unused arable land still exists in Haryana, advancing farmers are more likely to produce more water-intensive crops while exploiting groundwater reserves simply because they can afford to do so, effectively ignoring the detrimental consequences on the environment.

Similarly, in states like Punjab and Telangana, which are primary suppliers of rice to the Indian economy, there have been increasing concerns about the sustainability of the production of rice

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

(Ali, Sidhu and Vatta, 2012). Rice is a non-native crop to these states, and the unlimited procurement of the good at a price that is extremely attractive to farmers puts increasing burden on both the Indian exchequer as well as the individual states. The Indian exchequer will be burdened simply because the government is mandated to buy the crop at the MSP that has been proposed, forcing the government to purchase unsold stock at an unusually high price. Additionally, the individual state will suffer in the long run, simply because it is not sustainable to use up all of the available groundwater to produce a single good in the short run (Ali, Sidhu and Vatta, 2012). The state will find difficulty with unearthing unexploited groundwater, and if a meagre amount is available, the state will need to rely on crop imports from neighbouring states to keep the economy and the markets running, burdening the state exchequer as well (Sinha, Michalak, Balaji, 2022).

In Punjab, groundwater levels have declined significantly in the past decade, as farmers keep pumping groundwater out of natural reserves and depleting viable sources, the new sources of groundwater end up being far deeper than the old ones. This again puts immense economic strain on farmers to procure equipment and labor to construct borewells to ensure that their crop can survive in non-native conditions (Kumar, Kori, 2024). In addition to this, as groundwater is being predominantly used towards non-native crops, it permanently affects the ability of all the farmers in the area to use water to cultivate crops of their own. This is because, when a single farmer uses too much water, it reduces the amount of water that is available for other farmers to produce crops of their own (Kumar, Kori, 2024). This effectively takes profits away from all farmers involved in the long term, while satisfying the individual farmer's needs in the short term. Thereby making it a highly unsustainable method of production.

2) Lower crop diversification present due to the MSP

The implementation of an MSP inherently encourages the production of crops that are affected by the MSP. This means that farmers will move resources away from other crops toward the crop that is more profitable to produce, which will be the MSP crop in this case. This shift in production has inadvertently encouraged the overproduction of particular crops throughout the country, such as rice and wheat. The excess production of MSP crops that will be grown due to their profitability, will negatively impact biodiversity in the long run (Kumar, Kori, 2024). Monoculture farming involves the planting of a single crop over a long period of time, in this farming technique, a single crop is often planted in vast expanses and grown in bulk. Most farmers practice monoculture farming with crops that are under the MSP regime. In many states such as Haryana and Punjab, this has led to a loss in biodiversity which is driven by short term gains (Kumar, Kori, 2024). While these crops (rice and wheat) provide stable incomes for farmers due to their high yield rate, there will be an overall reduction in crop diversity, this is

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

because there are hardly any other crops that are being grown within the state due to the fact that they are less profitable than MSP crops.

By growing crops that are guaranteed to receive a high price, farmers effectively ignore other crops that will not give them as high of a return. It is fair to assume that there will be an exponential decline in the number of pollinators that are present in the long run. Rice is a predominantly self-pollinating plant, as is wheat, there is little to no nectar that is present within the flowers of the plant (Ali, Sidhu and Vatta, 2012). As these plants are farmed in the monoculture process, there will be fewer crops in the particular area that require insect pollination. As insects do not receive enough nectar to sustain themselves and are redundant while pollinating these crop, they may migrate to areas where they may find more crops that require pollination. The mass migration of insects could lead to a permanent loss in important pollinators, adversely affecting ecosystem health. This will also affect the yields of future farmers (Chachei, 2024), as there may not be a sufficient number of pollinators to help their plants reproduce. If pollinators are not required, there is no incentive to conserve insects which are not unwanted in the production of a crop. So, there is increasing reliance on pesticides to eliminate insects that may interfere with the yields of the farmers crop, as more and more fertilizer is used, there are extremely detrimental effects for the environment, which will be explored later. As pollinators disappear, predators such as birds and bats that feed on these insects to survive may begin to decrease as well, this leads to a permanent loss in environmental biodiversity (Chachei, 2024).

When monoculture farming occurs, farmers inherently supply the crop with fertilisers and chemicals that are engineered to boost the development of the particular crop that they are growing in bulk. Monoculture farming negatively impacts soil health by favouring the growth of certain plants that require specific microbes, while actively suppressing microbes that are not required for the plant to grow (Chachei, 2024).

Madhya Pradesh is a good example of the extreme consequences of monoculture farming. In Madhya Pradesh, the over-cultivation of cotton has been extremely detrimental for the environment in the long run. Cotton is a crop upon which an MSP is imposed, making it attractive for farmers to produce, cotton is also extremely simple to grow. Thus, there have been numerous farmers who abandoned their previous agricultural crops to pursue the cultivation of cotton in Madhya Pradesh (Ali, Sidhu and Vatta, 2012). Cotton generally attracts a large variety of insects and the monoculture farming of this crop, increased the population of insects in the state due to the abundance of cotton. This led to an unnatural increase in the number of unwanted pests in the state; resulting in harm to biodiversity and a reduction in the number of native insects due to the large inflow of non-native ones.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

3) Greenhouse gas emissions due to the cultivation of paddy

Paddy is a crop that has an extremely high MSP, giving the producer a 50% profit margin. Therefore, it is quite rational that farmers will produce this crop significantly for their own profits. However, as farmers continuously cultivate this crop, they are inadvertently contributing to immense emissions of methane and nitrous oxide (Chachei, 2024), which are the two main gases responsible for the acceleration of climate change in the past ten years. The cultivation of paddy is responsible for the major methane increases across several producing states (Chachei, 2024). When rice fields are underwater, any oxygen they contain is rapidly depleted, forcing bacteria in the soil to respire anaerobically, this creates methanogenic bacteria that produce large amounts of methane as they help digest the soil (Sinha, Michalak, Balaji, 2022). India is one of the largest rice producers and also one of the largest emitters of methane into the atmosphere (Ali, Sidhu and Vatta, 2012). Approximately 12% of the total methane emissions of India are due to the cultivation of rice. Rice cultivation in India releases approximately 3.396 teragrams (Tg) of methane yearly. Over the years, the MSP system has encouraged the production of rice in places where it is not suitable to do so, such as Haryana and Punjab. These states are naturally water scarce, and due to the high MSP of rice, their production results in the natural reserves of groundwater depleting while the emissions of methane rise (Sinha, Michalak, Balaji, 2022). It was recently found that implementing water management practices in fields by flooding intermittently and allowing the fields to dry out, can help slash methane emissions by a large number, this is a stark contrast to the traditional technique of keeping the fields waterlogged indefinitely (Kumar, Kori, 2024). However, rural farmers have no need to reduce costs and thus produce in the way that is traditional, simply because they can afford to do so (Ali, Sidhu and Vatta, 2012). More specifically, most rural farmers are unable to research about or be informed of the recent advancements in farming. The environment in the long term is not a concern to them simply because they receive a high price for their produce in the short run (Harsana et al., 2024).

While methane is a dangerous byproduct of paddy production, so is nitrous oxide, another harmful greenhouse gas. Nitrous oxide is 300 times more powerful than carbon dioxide in terms of its ability to finally trap heat inside the atmosphere (Chachei, 2024), making it a key contributor to global warming. Only a small portion of nitrous oxide fertilizer applied to the paddy crop is effectively utilized, this is because much of it leaches into the soil or escapes into the atmosphere as nitrous oxide (N_2O). Nitrous oxide is mainly released when the soil is waterlogged, and paddy must be submerged underwater for effective growth. Here, the lack of oxygen due to the paddy being underwater leads to denitrification (Sinha, Michalak, Balaji, 2022). Soil microbes underwater will begin to convert nitrate into gaseous forms of nitrogen due to the lack of oxygen, in this case, the gaseous form is nitrous oxide. By applying fertilisers,

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

farmers catalyse this process by speeding up and increasing the amount of nitrous oxide that is released into the atmosphere. In order to achieve the maximum yield that they can (Chachei, 2024) and in order to gain the largest amount of profit, farmers will fertilise their fields as much as they can. In India, fertilizer is relatively cheap and will not add on much to farmers' cost of production. Thus, farmers will incessantly fertilise their crops as they believe it will lead to a much larger, better yield, however the excess utilisation of nitrogenous fertilizers in paddy fields can increase N_2O emissions in a state by up to 20% on average (Chachei, 2024).

4)- Food wastage due to the MSP

The MSP encourages an over-allocation of resources towards particular crops, encouraging the overproduction of these particular crops. Due to the high price of the MSP, certain consumers are dissuaded from purchasing the good, either because they cannot afford it, or because they feel their money is better spent on an alternative good. This creates a surplus in the market, as overall demand for MSP crops is lower than the total supply of MSP crops. Normally, this surplus will force the price down to equilibrium level, as producers want to get rid of their excess supply, but this is not the case in India. In India, the government purchases all of the surplus that is present, ensuring that farmers receive the MSP even for goods that are unsold, thereby encouraging their production and effectively freezing the price at the mandated level. After the Food Corporation Of India, a subsidiary of the Indian government, purchases the crop from the farmers, they hand it over to the Food Corporation Of India, who is responsible for the storing of the surplus produce. The Food Corporation Of India is authorised by the government to purchase any unsold produce as well.

The Food Corporation Of India is encouraged to purchase any unsold crop at the MSP for the produce, this is done to incentivise farmers to produce more of the crop next harvest season, as they are guaranteed a price for their goods, while also acting as a price stabiliser. This guaranteed purchasing encourages farmers to overproduce so as to maximise their overall yield. However, due to this higher price, producers are less incentivised to cut their costs, this leads to a higher level of waste across the supply chain. As farmers receive an exorbitant price for their existing produce, they inadvertently mismanage or waste some of their crop as they have no incentive to keep it. During transport, a lot of the crop is damaged, thereby leading to waste. Farmers receive the MSP per quintal, and even if some of the crop is wasted or missing, they get paid the whole amount. For instance, they still get paid in full for the quintal, even though they may be missing a kilogram or two. This leads to inefficiencies and waste, food that could have been sold is unsold, and producers have no incentive to conserve or change the way they produce, simply because the bureaucracy allows them to waste to a certain degree. In addition to this, the Food Corporation Of India (FCI) which is a subsidiary of the Indian government, is tasked with storing the excess grain or produce that is received from the farmers. This assists with ensuring food

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

security, as the country has its own stockpiles of food, it will be unlikely to import or rely on other countries to provide it with food in case a shortage arises. This increases India's independence in terms of food, boosting the food security of the nation. However, the Food Corporation Of India, has inadequate storage facilities to store the excess produce that it procures. More than 38000 metric tonnes of food were found to be rotting in FCI storage warehouses simply because the facilities were run-down and dilapidated. While it is the government's responsibility to ensure that food security exists, the uneconomical wastage of food is detrimental. Farmers would be able to ensure that the food they supplied was being used in a productive manner, without being wasted, if simply they produced less. However the high incentive to produce overshadows the incentive to conserve or ensure sustainable production practices (Ali, Sidhu and Vatta, 2012).

5)- Air Pollution as a result of the MSP

In India, stubble burning contributes largely to the air pollution in the country. Most individual states have extremely poor AQI (Air Quality Index) numbers, simply because sustainable farming practices are not followed. Crop fields are generally planted with either paddy or wheat, and burning takes place quickly through stubble burning; in effect, farmers can clear massive stretches of arable land at virtually no cost, paving the way for new crops to be planted (Kumar, Kori, 2024). While burning stubble is illegal in India, it continues unabated in the majority of rural areas and towns where awareness of the Indian law makes enforcement of this practice a daunting task. Furthermore, farming communities have passed this practice from generation to generation, making it difficult to change one of the most basic of their agricultural practices, as it is ingrained in their communities. Stubble burning is extremely detrimental to the environment, it releases catastrophic amounts of carbon dioxide into the atmosphere (Chachei, 2024). The burning of rice alone is estimated to have released a total of 149 million metric tons of carbon dioxide. By maximizing short-term gain and cleaning out the fields as quickly as possible, Indian farmers are further exacerbating global warming. Beyond carbon dioxide, nitrogenous oxides and sulfur dioxide are also emitted by stubble burning (Chachei, 2024). These pollutants seriously degrade air quality, contributing to numerous health issues amongst humans and animals, while simultaneously forcing down the air quality index.

The MSP is applied to both wheat as well as paddy. As seen before, guaranteeing a price for a crop increases its production. During the production of wheat, there tend to be synchronised schedules that are followed so that farmers can produce all of their crop at the same time, they will proceed to sell all of their crop at the end of the harvest to the government. By producing at the same time and shipping in bulk (Kumar, Kori, 2024), transportation costs are cut down, which also saves time for the farmers as they will be growing essentially a single type of crop. After the wheat is harvested, the stalks of the plant will still remain, as farmers do not have the

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

labor or time necessary to handpick every single stalk of wheat, they set fire to the entire field. This ensures all the unused stalk of the crop is eliminated, by doing this, the farmers pave the way for new and profitable crops to be planted (Kumar, Kori, 2024). As the individual farmer faces no incentive to protect or conserve the environment, he will perform actions that help maximise his yield. Other options of stubble management, such as incorporating stubble into the soil with machinery or converting it into biofuels, are not adopted as they are costly and most farmers are unwilling to make the shift from traditional farming methods (Kumar, Kori, 2024).

Delhi, an Indian state that has the worst air quality in the country, experiences worsening air quality towards the winter months (Chachei, 2024). In agrarian states, there is generally a large harvest during winter, and due to large amounts of stubble burning in the neighbouring states of Haryana and Punjab to clear fields, Delhi's air quality worsens (Kumar, Kori, 2024). The smoke from these states tends to drift into Delhi, creating an extremely thick haze that is toxic. This worsens the AQI of Delhi, a state that is one of the smallest contributors to the Indian primary sector, and does not rely on agriculture at all. The guaranteed MSP gives farmers an incentive to produce cheaply and quickly to receive the maximum profit, while ignoring the overall environmental impact of their incessant and unyielding production (Kumar, Kori, 2024).

6)- Chemical overuse due to the MSP

India’s MSP encourages overproduction, incentivising farmers to produce as much as they can of the 22 MSP crops to ensure that they maximise their profit. Most farmers do not consider the environment while they farm, simply because it is unprofitable for them to do so. In the Indian MSP regime, farmers receive a generous price for crops such as rice or wheat (Ali, Sidhu and Vatta, 2012). To grow these crops, fertilisers are used heavily by farmers as these help catalyse plant growth while encouraging a healthier and stronger yield. India is the world's largest consumer of urea, which is a nitrogen based fertiliser. Urea is a fertiliser that has been heavily subsidised by the government, in addition to this, urea is also available everywhere, specifically in most rural agricare shops (Sinha, Michalak, Balaji, 2022). As the government subsidises this fertilizer, it is cheaper and easier for rural farmers to afford it. Thereby encouraging their widespread consumption (Ali, Sidhu and Vatta, 2012). Farmers often buy urea simply because it is profitable and straightforward for them to do so, they buy urea at the price of ₹500, which hardly adds on to their direct costs, as they make more than enough from the sale of their produce to finance their seemingly small purchases on fertiliser.

In addition to fertilisers, the MSP system inadvertently promotes the usage of pesticides in excess. Farmers aim to maximise their yield with healthy crops that will be bought by either consumers or the government, thus, farmers try to ensure that there are no defects that are present on the plants as they are receiving an extremely high price for this produce. However, high yield

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

crops that are grown in bulk and susceptible to insect borne diseases or other rapidly spreading diseases need to be cared for properly to ensure that they do not get affected (Chachei, 2024). Farmers use excessive amounts of pesticides to curb the spread of insect borne diseases to ensure that they have healthy and disease-free crops. By using the excess amount of pesticide, they maximize their short term benefits while effectively ignoring the long term impacts of their actions on the environment. Pesticide use has increased in lockstep with the minimum price in the last few decades, especially in the states like Punjab and Haryana, composed of mostly agrarian communities. About 60,000 metric tonnes of pesticides are used in Indian agriculture, with wheat and paddy cultivation accounting for more than 50% of the overall pesticide consumption.

Soil acidification is one of the major drawbacks of chemical-intensive farming practices. Most fertilizers are nitrogen-based substances, and nitrogen, mainly acidic in nature, contributes strongly to soil acidification. The increasing acidity of substances applied to soil upsets its PH balance further (Chachei, 2024). It shifts to the left in the PH scale, which increases the level of acidity. Healthy soil should ideally be either neutral or slightly alkaline, depending on its region. The artificial introduction of fertiliser in massive amounts completely distorts this notion, forcing the PH of the down, making it increasingly acidic instead of neutral or alkaline (Sinha, Michalak, Balaji, 2022). Soil in countries where communities depend on agriculture, namely Punjab and Haryana, have seen dips in the PH level of the soil, simply because farmers are indiscriminately using urea or other nitrogenous fertilisers due to their cheap price. As the PH of the soil falls, essential nutrients such as phosphorus and magnesium decrease, these nutrients are essential for plant growth and development, but often decrease in the soil due to the excess presence of nitrogen. Furthermore, beneficial microbes that help decompose old soil are destroyed due to the highly acidic nature of the ground (Sinha, Michalak, Balaji, 2022). This disrupts the local ecosystem. The Indian Council of Agricultural Research (ICAR) has proven that over 40% of Punjabs arable land has shown exponential nutrient depletion and increasingly acidic soil as a result of long term urea overuse. As farmers use urea to maximise their yield, they ignore the detrimental effect of this excess usage on the soil. The widespread use of urea affects the development and nutritional quality of soil negatively in the long run, impacting farmers in the future, as they will not be able to grow healthy crops in the same soil. Farmers sacrifice long term gains for short term profits, brought about by the MSP.

Additionally, nitrogen runoff is a significant consequence brought about by the usage of fertilisers in excess (Sinha, Michalak, Balaji, 2022). Urea and other nitrogenous fertilisers are able to easily dissolve in water, due to their acidic nature. Farmers use immense amounts of fertilisers in their fields, however, only a small percentage of this fertiliser is used by the plants in their growth and development. The rest of this fertilizer is wasted. Using urea in excess leads

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

to imbalances in soil nutrients and lower yields as a result. As there is only a small amount of fertilizer being utilised by the produce, the unused fertilizer that cannot be absorbed by crops leaches into groundwater (Sinha, Michalak, Balaji, 2022). As the fertilizer leaches into groundwater, it permanently hampers the ability of the water to be used effectively as either a drinking or bathing source, thereby leading to permanently lost resources. Due to the excessive use of fertilisers to maximise yields of MSP crops, the water reserves of agrarian states such as Haryana and Uttar Pradesh have tested to be 60% contaminated with toxic nitrate waste. During the monsoon season, when there are heavy rains, the nitrogen may be carried away from fields due to the rains and into nearby water bodies (rivers, lakes or ponds). This runoff could lead to severe eutrophication in nearby bodies, wherein there is rapid growth of algae due to the lack of oxygen (Sinha, Michalak, Balaji, 2022), there is also a loss of aquatic life due to the decrease in oxygen levels, reducing biodiversity in the area. In India, The Yamuna and the Ganges, which are two major rivers have been significantly impacted by uncontrolled nitrate runoff, permanently destroying the aquatic ecosystem while laying waste to sacred and important landmarks (Sinha, Michalak, Balaji, 2022).

As the price of MSP crops rises, there will only be higher incentive for the individual farmer to produce, thereby maximising his overall yield and receiving a guaranteed income. As the farmer decides to focus on growing his crop, he effectively ignores the negative externalities of production that occur as a result of these, simply because he can afford to do so. By overusing nitrogenous fertilisers, the farmer is effectively ruining significant cultural landmarks and contaminating groundwater reserves. The individual farmer will not realise it now, but the long term sustainability and survival of resources is far more important than the price received for a quintal of wheat or rice (Sinha, Michalak, Balaji, 2022).

This paper adopts the position that the implementation of Minimum Support Prices (MSPs) is associated with environmentally detrimental outcomes, particularly through the encouragement of resource-intensive and unsustainable agricultural practices. However, it is important to acknowledge that the analysis presented here is correlational in nature and does not establish a definitive causal relationship between MSPs and environmental degradation. Numerous external factors, such as regional climate conditions, technological availability, state-level enforcement mechanisms, and market dynamics may also influence farming decisions. While strong associations are observed, further research employing longitudinal or experimental methods would be necessary to determine causality with greater precision and confidence.

Literature Review

It is clear in the economic theory section of this paper that a surplus of produce exists when a minimum price is imposed upon it. Due to the guaranteed purchase of the surplus by the

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

government, the incentive for production of the good to increase income is maximised. Circling back to the hypothesis that farmers often overlook ecological costs of production due to a higher price, the literature review utilises multiple reputed research papers to help demonstrate the detrimental impacts on the environment that exist when a high MSP price is imposed. The purpose of this literature review is to provide concrete data and evidence on the claims that are being presented in this paper. In addition, the literature review aims to help give the reader a nuanced understanding of the complex relationship between the environment and the minimum support price, so they can make an informed and accurate assessment of its implications. While examining each paper thoroughly, it was evident that the MSP encourages extreme and unsustainable overproduction. As policymakers consider expanding or reforming the MSP regime, environmental consequences must be treated as a central component of agricultural policy analysis.

1)- The role of farm subsidies in changing India's water footprint (Chatterjee, Lamba and Zaveri), 5 October 2024

A study by Chatterjee, Lamba and Zaveri (2024) helps illustrate how output subsidies and guaranteed procurement have inadvertently led to unsustainable practices in agriculture and consequently, consequences for the environment. Both output subsidies and an MSP promote overproduction of particular crops. Thus, we can assume that the effects of the output subsidy on the environment are similar to the effect of an MSP, as both deal with a guaranteed price for crops produced. This study mentions that guaranteed procurement encourages farmers to overproduce water-dependent crops, such as rice and wheat; this unsustainable usage of water in the production process has been a major contributor to groundwater depletion in Punjab and Madhya Pradesh.

The quantitative analyses in this paper apply statistical techniques to assess the influence of these policies on the groundwater levels of the states. The research indicates that overproduction driven by government policies has caused a 30% increase in the water-consuming crop area. Rice procurement alone accounted for a minimum of 50% of the decrease in groundwater levels in Punjab in 34 years. Thus indicating that such policies have direct environmental impacts. While the policies are intended to ensure food security and stable farmer incomes, these laws have inadvertently created serious ecological challenges for the nation. This research shows that reforms are needed in the legislative system to balance agricultural production processes and environmental sustainability.

By showing the direct detrimental impacts that government intervention has on the environment, it also demonstrates the fact that the ensured procurement by the government leads to depleting natural resources. This regime guarantees purchasing of unsold crops as well, as both these

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

policies guarantee purchasing, they inadvertently encourage overproduction and lead to a surplus in the economy, forcing the government to purchase excess produce.

2)- Effectiveness of Minimum Support Price for Paddy in India with a Case Study of Punjab (Ali, Sidhu and Vatta), December 2012

A study by Ali, Sidhu, and Vatta **(**2012**)** focuses on the depleting groundwater reserves due to overproduction in the Indian state of Punjab. The author of the paper explores how the overproduction of the paddy crop has created a significant drop in the amount of groundwater that is available due to overproduction. The excessive production of paddy in the predominantly agrarian state has occurred due to the high MSP being mandated for it. As the farmers have a high incentive to produce, and paddy requires a large amount of water to grow, they often overuse water to ensure that they will produce enough paddy to garner the MSP that is mandated for it. The author uses quantitative evidence and measures the degree of the surplus while finding a positive correlation between groundwater depletion and the increasing amount of paddy production.

This paper underscores the negative effects that the implementation of an MSP has on the environment and the groundwater reserves of a particular state, impacting various stakeholders that are involved. Due to the higher MSP, there is extreme incentive to produce for rural farmers who desire profit in Punjab. In doing so, they inadvertently deplete and produce in a manner that affects their own groundwater reserves in the long run. This directly supports my hypothesis, wherein it is noted that the environment could be affected adversely due to the higher MSP. Here, it is shown that key groundwater resources in Punjab are being degraded as the high MSP encourages overproduction, incentivising farmers to utilise scarce resources in an excessive manner so they can maximise their yield and receive the highest amount of profit that is possible.

3)- India's Riverine Nitrogen Runoff Strongly Impacted by Monsoon Variability (Sinha, Michalak, Balaji), 27 July 2022

A study by Sinha, Michalak, Balaji (2022) demonstrates the impact of nitrogen runoff in Indian river systems, it is specifically investigated in states where MSP-driven agriculture has led to excessive application of fertilizers. The overproduction of wheat and rice due to incentive by the MSP and how it leads to nitrogen leaching into river basins and eutrophication is also discussed. Proof is given that there is a pronounced role of heavy rains transporting surplus nitrogen into the waterways, leading to algal blooms and extreme eutrophication, directly supporting the hypothesis presented in the analysis earlier. The author has investigated nitrogen discharge trends as affected by rainfall, agricultural intensification, and nutrient runoff. This paper brings to light the unintended environmental repercussions of excess fertilizer use incited by MSP,

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

notably in the regions where monsoon precipitation causes increased nitrogen losses into nearby bodies of water.

The paper explains how MSP promotes excessive nitrogen application for crop yield enhancement; the majority of this nitrogen is, however, displaced by seasonal runoff. This causes river pollution, algal blooms, and the eventual collapse of water quality and the aquatic ecosystem of a particular region. The higher MSP incentivises farmers to maximize their wheat and rice production through the over-fertilization of their produce to the extent where crop productivity may not necessarily be increased, leading to unwanted nitrogen losses. This study supports that MSP encourages unsustainable farming practices that lead to environmental deterioration, particularly from excessive fertilizer use, thereby justifying my hypothesis.

4)- The Impact of Minimum Support Price (MSP) On Crop Residue Burning (CRB) In Punjab and Haryana: Consequences for Air Quality in Delhi (Kumar, Kori), 29 March 2024

A study by Kumar and Kori (2024), focuses on the effects of the MSP on air quality in India. The paper explores the implications of the implementation of an MSP in neighbouring states on the overall air quality index of the respective states. By analysing crop residue burning through the Air Quality Index of Delhi and utilising price data for two of the most produced crops in Haryana and Punjab (wheat and Paddy), the paper draws conclusion that while the high MSP may contribute to overproduction, it may not necessarily be the single factor driving down the Air Quality Index in Delhi due to stubble burning in Punjab and Haryana. By using a quantitative analysis and measuring the degree of crop residue burning with the minimum support price, the study draws the final conclusion that among other factors, the burning of crops under the MSP can be a factor contributing to the increasing air pollution in Delhi during harvest season. While this paper did find a negative correlation between crops with a higher MSP and CRB, the results may not be conclusive as crops that have a lower MSP are generally mass produced, due to the ease and cheap nature of their production. A Pearson correlation model was used to correlate crop residue burning with various MSP crops from different states.

This paper examines the effects that the implementation of an MSP has on the air, impacting various stakeholders that are involved. While the study does find a negative correlation between MSP crops and crop residue burning, causation is not established, indicating that broader and more thorough research is required to support the hypothesis. However, it is noted that some air pollution in northern Indian states could be attributed to over-production of MSP crops, prompting farmers to perform cheap and unsustainable “stubble burning” to clear their fields so they can plant new and profitable MSP produce.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

5)- Greenhouse gas emissions in the Indian agriculture sector and mitigation by best management practices and smart farming technologies-a review (Katrina Chachei), 29 June 2024

A study by Katrina Chachei (2024) outlines the impact of crop overproduction on the environment, especially in states where MSP-driven agriculture has led to excessive production of non-native crops. The study looks at how controlled flooding of paddy fields, which fall under the MSP banner, leads to higher methane emissions due to anaerobic decomposition. It also notes that high fertilizer application, driven by MSP-introduced incentives of high yield, contributes to climate change by emitting significant amounts of nitrous oxide. Agrarian communities, like Punjab and Haryana, are now major producers of the paddy crop, which is non-native, they have significantly increased their overall methane discharge as well, since they are using immense amounts of water to irrigate their crop. This justifies the notion that MSP fosters practices that are highly unsustainable to the environment. The author researches in a quantitative manner, measuring the variability of greenhouse gas emissions relative to agricultural production, irrigation practices, and nitrogenous-fertiliser application rates.

This study discusses the unintended consequences of MSP, especially with regard to how over-irrigation and nitrogen overuse are major factors contributing to methane and nitrous oxide emissions. The results suggest that the MSP encourages high yields, and by guaranteeing a price, the government increases overall supply in the economy. However, it also encourages unsustainable farming that increases agricultural emissions due to overproduction. In an effort to maximise their crop yield, the excessive use of nitrogenous fertilizers occurs, not all of these fertilisers are used effectively and most are wasted and leach into water bodies. This study supports the hypothesis that MSP promotes unsustainable farming methods that are detrimental to the environment, through excessive irrigation and increasing amounts of nitrogenous fertiliser to maximise the producers yield. This leads to increasing greenhouse gas emissions that are detrimental to the atmosphere.

Data Analysis

This paper employs both quantitative and qualitative methods to assess the impact of Minimum Support Prices on agricultural practices. The quantitative analysis will examine relevant datasets related to crop yields, input usage, and pricing trends. To complement these findings, qualitative insights were gathered through interviews with farmers who are directly affected by MSP policies, offering ground-level perspectives on how such interventions shape production decisions and environmental outcomes.

ISSN: 2455-8834

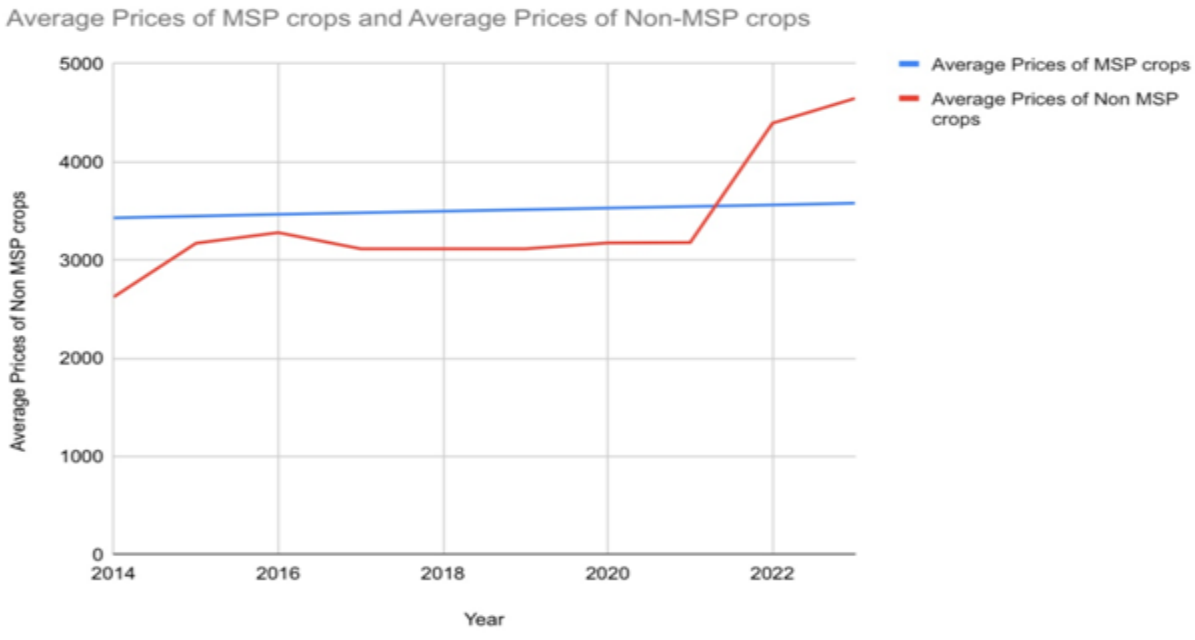
Volume:10, Issue:07 "July 2025"

Quantitative Data Analysis

This section of the research paper aims to present a thorough and comprehensive quantitative analysis aimed at empirically evaluating the impact of the Minimum Support Price (MSP) regime on both crop prices and production trends over time. This section of the analysis draws from official datasets published by the Food Corporation of India, and the Directorate of Economics and Statistics under the Ministry of Agriculture. In order to ensure accuracy and establish trends without the presence of extreme outliers, this analysis compares the average annual prices and production volumes of five key MSP crops which are paddy, maize, cotton, chickpeas, and mustard. These MSP crops are compared against five similar non-MSP crops which are barley, sorghum, jute, cowpea, and linseed. In order to ensure accuracy and real-time information, the period of time where the analysis was conducted was from the year 2014 to 2022. This ensured calculated and reliable analysis from recent data. By analysing the quantitative patterns that influence the decisions of farmers, this section helps build a rigorous empirical foundation that helps evaluate the overall socioeconomic and environmental impacts of the MSP regime in India.

Analysis of price

Figure 5: Average Prices of MSP and Non-MSP crops over time



Data for the graphs was sourced from the Food Corporation of India (FCI) Annual Reports (2014–2022), accessible via the official FCI website. This data was supplemented with market

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

price data from the Ministry of Agriculture & Farmers Welfare (Agmarknet Portal). The dataset includes the Minimum Support Prices (MSP) for five major MSP crops averaged across each year, compared to the average market prices of five similar non-MSP crops over the same period. Prices for non-MSP crops were extracted from state-level average price reports available in the "Daily Market Prices" and "Monthly Summary" sections of Agmarknet.

The crops that were considered in the analysis for prices as well as the production of MSP and Non-MSP crops over time were kept constant throughout. The MSP crops that were used to create the charts are: Paddy, Maize, Cotton, Chickpeas and Mustard. Whereas the non-MSP crops that were considered are: Barley, Sorghum, Jute, Cowpea and Linseed. All of these crops were considered as they are grown under very similar climatic conditions and serve to be compared to each other, many of the crops that are listed serve extremely similar functions. This selection strategy helps minimize confounding variables, particularly those related to ecological or environmental suitability, and reduces the risk of omitted variable bias when comparing production patterns and pricing, both with and without the presence of MSPs. While not eliminating all disparities, this approach improves the fairness and internal consistency of the analysis. All of the data here has been averaged, the minimum prices for the five MSP crops have been added per year and divided by 5. Similarly, the market prices for the five non-MSP crops have been added per year and divided by 5, giving us a picture of what the average prices look like in comparison to each other.

Through the data shown, prices for MSP crops showed a gradual upward trend, showing the Indian government's measures to ensure that farmer incomes align with inflation, as well as ensuring that farmers are able to cover their rising direct costs, thereby ensuring that they do not have to absorb any losses using their personal funds. This heightens income security while ensuring profit for farmers. Additionally, the pricing for MSP crops is quite predictable, increasing at a steady pace, which enhances security for farmers since it is highly unlikely that the government will set a price that is lower than the MSP in the future.

However, non-MSP crops are determined by the market. The average prices of MSP crops have consistently been higher than those of non-MSP crops, particularly before 2020. The elevated prices and guaranteed purchasing for MSP crops encourage farmers to cultivate more of these varieties. On the other hand, non-MSP crops are subject to unpredictable pricing, putting farmers at risk without any assurance of minimum returns. The data reinforces the idea that MSP crops provide better price stability. Farmers who grow MSP crops are protected from price drops, a risk that non-MSP crop farmers encounter during times of market surplus or weak export demand. In addition, the prices of non-MSP crops are consistently lower than those of MSP crops, this further reduces the incentive for producers to produce these crops. The price of these

ISSN: 2455-8834

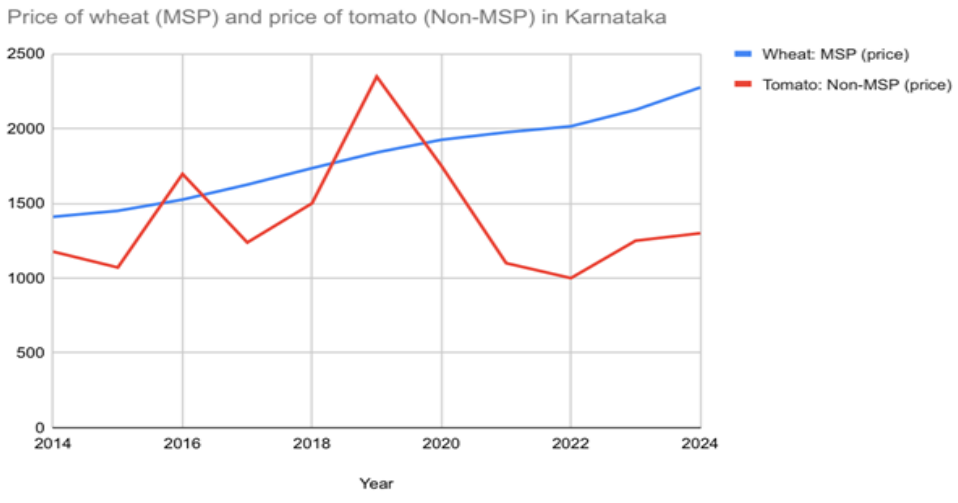
Volume:10, Issue:07 "July 2025"

crops is low, barely rising over the years until 2021, further adding to the apprehension over their cultivation.

Although prices for non-MSP crops have risen since 2021, it remains more sensible for farmers to rely on MSP-backed crops due to the guaranteed procurement and price stability they offer. The price increase for non-MSP crops may be attributed to fewer farmers cultivating them, owing to the overproduction of MSP-supported crops. It is also likely that pandemic-related disruptions played a significant role (Sudhakar et al, 2017). Regional supply chain constraints, labor shortages, or localized production halts temporarily reduced the availability of non-MSP crops, thereby inflating their prices. However, as market signals show profitability in non-MSP crops, more farmers could begin shifting production toward them. As the supply of these crops increases, the current elevated prices are expected to decline. Therefore, while non-MSP crop prices may currently be high, it is unlikely that they will continue to rise or even plateau. Thus, they are expected to correct downward, potentially even dropping below MSP price levels over time.

Thus, rising MSP prices provide farmers with reliable returns, making MSP crops more appealing than non-MSP options. Farmers are confident that even if market prices fall, their produce would still be bought at the MSP, which motivates them to consistently produce and dedicate land to these crops. This directly supports my prediction of overproduction, farmers intend to produce as much as they can, as quickly as they can. As a result of this, stubble burning, monoculture farming and excessive land clearing occur due to their convenient and cheap nature, the incentive to produce is far too great due to the high and steadily rising price of the MSP crops, forcing the farmers to produce the maximum they can, to maximise their profits.

Figure 6: Price of an MSP crop and a Non-MSP crop over time



ISSN: 2455-8834

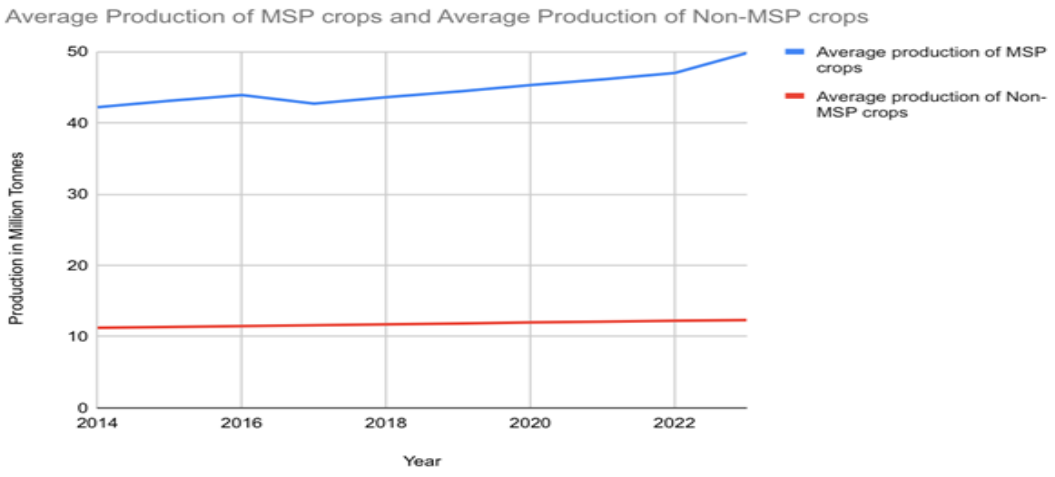
Volume:10, Issue:07 "July 2025"

Data was compiled from the Directorate of Economics and Statistics, Department of Agriculture & Farmers Welfare, and cross-verified with Agmarknet market price reports and FCI procurement price archives. The analysis spans the years 2014 to 2024. Annual average retail prices for wheat (an MSP-backed crop) were compared to annual average prices for tomatoes (a non-MSP crop) during the same timeframe. Retail price data was taken from the "Commodity-Wise Retail Prices" section of the Monthly Price Bulletin, while MSP figures were extracted from the "Minimum Support Price for Crops – Historical Data" spreadsheet provided on the Ministry's official site.

Analysing the prices of the individual MSP crops against other crops that are unaffected by the MSP reveals that MSP crops followed stable and consistent price patterns, rising slowly to ensure that farmers interests were protected, this contrasts with Non-MSP crops, wherein growth and increases in prices are extremely volatile. Wheat and tomato are excellent examples to help justify this statement, wheat is an MSP crop that is used in nearly every Indian household, tomato is a non-MSP that is also used in a widespread manner like wheat. While tomato prices spiked suddenly before dropping substantially, the price of wheat grew slowly and steadily, only speeding up toward the end of 2022. Extreme changes in demand and destruction of arable land due to adverse weather led to the price of tomato soaring, as the supply was constricted, but when new tomatoes were able to be harvested, prices began to drop dramatically, staying low before rising by a small amount. Farmers will be unable to sustain profits in the long run if they depend on the fluctuations of the market to receive profits, as shown above. Thus, by mandating a price, the government subverts the fluctuations of the market and guarantees that a farmer receives a fair price that is in line with inflation and production costs.

Analysis of production

Figure 7: Average production of MSP and Non-MSP crops over time



ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Data for the graphs was obtained from Food Corporation of India (FCI) Annual Reports (2014–2022), and from the Directorate of Economics and Statistics, Department of Agriculture & Farmers Welfare via the "Agricultural Statistics at a Glance" reports and Crop Production Estimates. The total production volumes (in metric tonnes) of five key MSP crops were summed and compared against the summed production volumes of five comparable non-MSP crops over the 2014–2022 period. Data was specifically extracted from the "All India Crop-Wise Area and Production" tables published annually.

The crops that were considered in the analysis for prices as well as the production of MSP and Non-MSP crops over time were kept constant throughout. The MSP crops that were used to create the charts are: Paddy, Maize, Cotton, Chickpeas and Mustard. Whereas the non-MSP crops that were considered are: Barley, Sorghum, Jute, Cowpea and Linseed. All of these crops were considered as they are grown under very similar climatic conditions and serve to be compared to each other, many of the crops that are listed serve extremely similar functions. This selection strategy helps minimize confounding variables, particularly those related to ecological or environmental suitability, and reduces the risk of omitted variable bias when comparing production patterns and pricing, both with and without the presence of MSPs. While not eliminating all disparities, this approach improves the fairness and internal consistency of the analysis. All of the data here has been averaged, the production data for each of the five MSP crops have been added per year and divided by 5. Similarly, the production data for the five non-MSP crops have been added per year and divided by 5, giving us a picture of what the prices looked like in comparison to each other.

In Figure 7, it is seen that MSP crops have always been produced at an exponentially higher level than Non-MSP crops. It is evident from the graph that there is a clear upward trend in the production for MSP crops, particularly staples such as paddy or wheat. Despite rare fluctuations in the production of these goods due to adverse weather conditions, the production of them has been increasing over the past decade, rising slowly. As the MSP is guaranteed to farmers, they face more incentive to produce this good. Farmers will only produce more of the good if they can, they will not produce less unless there are other circumstances that are affecting their yield. The graph is upward sloping, inferring that farmers are producing more and more of the MSP crops over the years, simply because it is profitable for them to do so. There was an increase in the MSP from 2014 to 2016, then it was constant until around 2021. The faster growth in production of MSP crops between 2017 and 2022 could be attributed to the given increase in 2014-2016. The prices for MSP produce steadily rises over the years, and it is logical that farmers will try to maximise their output. Certain farmers may purchase more arable land to produce the MSP crops and enjoy the excess profits, making the land purchased a profitable investment. In addition to this, while there may be short-term fluctuations in the production of

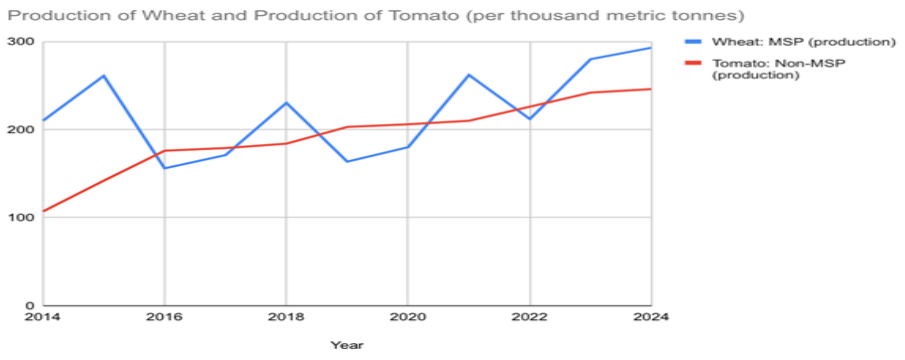
ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

the product due to external circumstances, farmers will still be incentivised to cultivate the crop because of the higher MSP, the short-run decline in production will be negated by the MSP, which will incentivise farmers to produce the maximum amount of the crop that they can, in order to receive a guaranteed income. The MSP regime guarantees that any surplus that is created by the MSP will be bought up by the Indian government, thereby increasing the incentive for farmers to produce the crop at the MSP, simply because they cannot lose any profits due to the creation of a surplus. This guarantees their income security, while encouraging them to produce as much as they can, because they will always have a consumer for all of their excess crop, in this case, the consumer will be the government of India.

On the other hand, non-MSP crops have exhibited a nearly stagnant production pattern. Most of these crops are essentials as well, but are not produced as much as MSP crops for a number of reasons. Firstly, the non-MSP crops do not have a mandated price, this leaves farmers subject to the ever-fluctuating market conditions, prices will always rise and fall, and farmers may not know if they will receive a guaranteed return on investment. Due to erratic market conditions, it is more sensible for farmers to produce a crop that falls under the MSP banner, this increases their income security by ensuring that they are able to receive a fair amount on their investment, regardless of whether the good is in demand or not. In addition to this, there is no incentive to produce any more of the produce than what was being demanded the previous year, the crop does not fall under the MSP banner, and any surpluses of the crop in the market will force down the market price, leaving farmers susceptible to losses. By producing at a low level that is guaranteed to be consumed, farmers ensure not to create a surplus, stabilising the equilibrium price for the produce. In addition to this, the lower market price than the MSP discourages the production of the good in excess, there is no price guarantee and farmers are left in the hands of the free market. Thus, farmers may reallocate their resources to the more profitable MSP crops, this will lead to an allocation of resources away from non-MSP crops, keeping their production stagnant while increasing the production of more profitable crops.

Figure 8: Production of an MSP crop and a Non-MSP crop over time



ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Graphs were constructed using data from Food Corporation of India (FCI) procurement reports and crop production statistics available from the Ministry of Agriculture & Farmers Welfare – Directorate of Economics and Statistics. The analysis covers the years 2014 to 2022. The total annual production (in tonnes) of wheat, a major MSP crop, was compared to the total annual production of tomatoes, a non-MSP crop. Production figures were sourced from the "Final Estimates of Horticultural Crops" under the Horticulture Statistics Division, and the "Fourth Advance Estimates of Crop Production" for food grains, ensuring consistency across reporting periods.

Analysing the prices of the individual MSP crop against another crop that is unaffected by the MSP, reveals that MSP crops followed relatively fluctuating production patterns. As wheat is an extremely heat sensitive crop, its production fluctuated during the months wherein climate change began to rise, leading to more erratic production patterns. However, the non-MSP crop followed a relatively low and stable production pattern in comparison to MSP crops. Wheat is an MSP crop that is used in nearly every Indian household, tomato is a non-MSP that is also used in an indiscriminate manner like wheat. The production of wheat reveals considerable year to year production volatility, due to weather variations, as the price is fixed for wheat, the dips in supply are attributed to non-price factors rather than a lack of price incentives. However, the MSP which was fixed for wheat was relatively high, averaging ₹2000 per quintal from 2022 - 2024, due to this increased incentive to produce, the production of the crop recovered sharply after the initial drop in 2022, showing how the higher MSP directly influences production rates by a large percentage. In addition, the production of wheat has been showing an upward trend lately, suggesting that the high minimum price has helped stabilize the production of wheat, ensuring that farmers maximise their production of it to ensure a high income.

However, at most points tomato is produced at a lower quantity than wheat, this is primarily because of the lack of an MSP. The market price of tomato is subject to changes due to the fluctuations in the market, the low price elasticity of supply for the good also means that farmers cannot necessarily ramp up production if the price of the good rises. Thus, to ensure that they are producing the bare minimum that will not create a surplus in the market, farmers produce tomatoes at low, and slightly increasing rates, leading to a production curve that changes slightly every year. In addition to this, the lower production of the good suggests that there is higher profitability when producing a crop that is under the MSP regime, thereby leading to an underallocation of resources to tomato, and an increased allocation of resources to the production of a more profitable MSP crop, in this case, the crop is wheat.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Qualitative Data Analysis:

Recognizing that quantitative data alone may not capture the complexities of rural agricultural livelihoods, I adopted a qualitative approach to complement existing literature and statistical analysis. For a nuanced and informed understanding of the Minimum Support Price (MSP) and its implications on ground-level agricultural practices, I believed it would be prudent to communicate directly with key stakeholders. In this case, the main stakeholders were farmers most affected by these policy mechanisms. By conducting in-depth interviews with two farmers who owned small and medium-sized farms in Karnataka, I sought to understand their perceptions and effects of MSP implementation. This method provided insight into both the policy's intended effects and its on-ground realities, including access, awareness, economic effects, and environmental impacts. The findings from these conversations serve as the foundation for a deeper, comprehensive and grounded analysis of the efficacy and effects of the MSP system.

For this section of the paper, I received qualitative information from two farmers who grow crops that are under the minimum support price regime. Before beginning the analysis of this data, it should be noted that the reason for choosing this sample of farmers was due to convenience, the interviewees were accessible to the interviewer at a local market. In addition, it should be noted that in order to ward off misunderstandings while allowing the participants to conducively answer questions that were asked, the interviews were conducted in Kannada. The answers of the interviewees to questions posed are presented as written responses which are exact translations of their statements to the interviewer. These interviews were collected through convenience sampling at a local market and provide qualitative context for the paper's analysis. They offer insight into farmer behavior and perspectives related to MSPs, complementing the quantitative findings discussed earlier. The information being analysed was obtained through a short discussion with 3 questions, the questions asked as well as the responses to the given questions are enclosed below:

Questions:

1)- What crops do you grow and how much land do you own? Are any of the crops that you produce MSP crops? If so, why do you produce these MSP crops?

2)- How much is the lowest price that you would be willing to accept for an MSP crop that you grow? Does the price that you receive cover all of your costs and ensure a reasonable profit for you?

3)- Since you produce MSP crops, do you ensure that the environment is unharmed when you are producing these crops? Do any unsustainable farming practices occur so that you can grow as many crops as you can?

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Responses of the First Person: Interviewee 1

Crop Production: I primarily grow wheat, rice, and pulses on about 50 acres of land in Karnataka. I mostly produce the crop that gets the MSP since at least I know I will earn that money. Any leftover crop will also be purchased by the government.

Minimum Price Accepted: As a farmer, the minimum price I would accept depends on my production costs, market trends, and government support. For example, if I grow wheat, my cost per quintal might be ₹1000-1300 per quintal, factoring in seeds, fertilizers, labor, and transportation. To make a sustainable profit, I'd need at least 1500 per quintal. The government sets a Minimum Support Price (MSP) at ₹2400 per quintal, so I receive more than what I need.

Environmental Concerns in Farming: Yes, I consider the environment while farming. I've started using more organic manure and natural pest control methods since using chemicals is not very good or sustainable when thinking about the future. Water conservation is also important, drip irrigation and rainwater harvesting help reduce wastage.

Responses of the Second Person: Interviewee 2

Crop Production: I cultivate rice, chickpeas, and rapeseed on about 40 acres. I've started with growing pulses since they help improve soil fertility and require less water. Some pulses also come under MSP. I know the government will buy any wasted crops also, so I just grow as much as I can.

Minimum Price Accepted: As a farmer, I need to cover my costs, labor, and get some profit. For example, growing rice costs me around ₹1000 per quintal, including seeds, fertilizers, water, and transport. To make a fair living, I need at least ₹1200 per quintal. If the government's Minimum Support Price (MSP) is ₹2300 per quintal, it gets me a high profit and helps me feed my family.

Environmental concerns in Farming: I focus more on getting a good price. Since the MSP is set, my priority is making sure the yield is good. Using more fertilizers and pesticides help increase production, even if it affects the soil, I can get good money and purchase new land for growing more MSP crops. Water use is also high, but conserving it isn't my main concern because water is free here and it is helpful for profits.

Conclusions drawn from these interviews:

Both of these farmers prioritise the growing of MSP crops. Interviewee 1 produces wheat, rice, and pulses, all of which fall under the MSP category, similarly, Interviewee 2 produces rice, chickpeas and rapeseed, all of which are MSP crops. Interviewee 1 makes sure to note that the MSP acts as a safety net, ensuring that there is a guaranteed income that is received as a result of

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

the production of these crops, this further increases the incentive to produce these crops over others, they stabilise income for farmers. Interviewee 2 also states that she is aware about the government purchasing any excess surplus, thereby ensuring that there is an amount that is given for each quintal that is produced. This adds on to the incentive to produce, thereby increasing the number of MSP crops that are being produced due to their profitable nature. In addition, Interviewee 2 notes that to maximise her profit she has begun growing certain other pulses that fall under the MSP banner, thereby showing how the MSP distorts market signals, incentivising farmers to produce more goods that fall under the MSP regime, while effectively ignoring other crops that are less profitable and do not have a mandated price.

The responses of the two farmers showed contrasting opinions towards the sustainability of producing MSP crops. While Interviewee 1 takes an environmentally friendly approach, Interviewee 2 chooses to ignore the environment and produce in an unsustainable manner to maximise her profit. This contrast highlights a critical tension between real-world farmer behavior and the simplified economic model used in this paper, which assumes that farmers act solely to maximize profits without accounting for societal or environmental externalities. The interviews reveal that actual decision-making can be more nuanced, some farmers do consider long-term environmental impacts. Interviewee 2 notes that "Since the MSP is set, (her) priority is making sure the yield is good", this further shows how the incentive to produce leads to inefficient and unwanted outcomes, due to the high MSP price, she ignores and produces in an unsustainable manner to receive the maximum price that she can. By using excess fertiliser, her actions support the prediction that an MSP leads to an overuse of fertilisers. Here, to ensure that her plants grow quickly and healthy, not wanting to miss out on lost profits, she uses more fertilisers and pesticides, ensuring that her plants are disease free and mature as quickly as they can. While she is aware that this is unsustainable in the long run, the MSP is too attractive for her to choose to adopt more costly, environmentally responsible alternatives to these. As the MSP is set at such a high level, she even notes that purchasing new land is an option, simply because she will have the retained profits to do so, suggesting that she is willing to harm the existing arable land and move onto other land as the high MSP profits will allow her to do so. Noting that the MSP keeps rising, the incentive for her to produce so as to maximise her yield increases with it. Producing in an unsustainable manner for short-term profits is inefficient as well as unsustainable in the long run.

Conversely, Interviewee 1 presents a perspective that complicates the assumption that the Minimum Support Price (MSP) universally leads to unsustainable farming practices. He states, "I mostly produce the crop that gets the MSP since at least I know I will earn that money," highlighting how MSPs influence crop choice by offering a guaranteed income. However, his farming decisions reflect more than just profit-maximization. He explains, "I've started using

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

more organic manure and natural pest control methods since using chemicals is not very good or sustainable when thinking about the future,"showing a clear awareness of long-term environmental impacts. Additionally, his emphasis on water conservation "Drip irrigation and rainwater harvesting help reduce wastage", demonstrates a strong commitment to responsible resource management. Despite the high MSP he receives "The government sets a Minimum Support Price (MSP) at ₹2400 per quintal, so I receive more than what I need" he is able to resist the temptation to intensify production in harmful ways. This case suggests that while MSPs provide strong financial incentives, they do not always lead to environmental degradation. Interviewee 1's approach shows that sustainable practices can coexist with government price supports, and that some farmers internalize environmental concerns even within economically favorable policy frameworks. This may be the case for numerous farmers around India, the first interview contrasted with the hypothesis, revealing that sometimes, individual decision-making often balances economic incentives with environmental awareness, challenging overly simplistic assumptions.

Conclusion

The purpose of this paper is to examine whether the implications on the environment when an MSP is imposed are negative. Through lengthy theoretical framework and literature review, we have determined that these implications are indeed detrimental. Due to the guaranteed price that is mandated for the produce, Indian farmers may contribute over and above what would happen in a situation without an MSP, to both air pollution and nitrogen runoff into the environment as they are producing in ways that are unsustainable to rationally maximize their profits. Furthermore, food wastage and excess greenhouse gas emissions may occur as a result of excess production of MSP crops. Furthermore, as a result of the high MSP, farmers will be incentivised towards producing those particular crops, leading to a constriction in supply for non-MSP crops, as they are less attractive to produce. Lastly, excess irrigation of non-native MSP crops, such as paddy, can deplete natural groundwater reserves in arid states.

From interviewing farmers that produce goods that fall under the MSP banner to evaluating reputed and lengthy research papers, we see how most farmers are willing to produce unsustainably to maximise their crop yield due to the high MSP. This guarantees them income for the crop that they have produced. As the incentive to produce is too high, farmers are willing to degrade the environment in order to produce their goods more quickly and efficiently. This underscores the environmental and long-term implications of the imposition of a minimum support price.

Thus, while economic theory would predict that the MSP stimulates production and stabilises farmer incomes, the price floor is inadvertently detrimental toward the environment due to the

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

production that it encourages. So, in order to ensure more sustainable and efficient production, it is imperative that the government implements measures that nudge farmers towards sustainable farming, thereby ensuring that the environment is not wastefully compromised as a consequence of profit maximising.

References

Chatterjee, Shoumitro, Rohit Lamba, and Esha Zaveri. 2024. "*The Role of Farm Subsidies in Changing India's Water Footprint.*" October 5. Accessed July 14, 2025.

Ali, Shayequa Z., R. S. Sidhu, and Kamal Vatta. 2012. "*Effectiveness of Minimum Support Price for Paddy in India with a Case Study of Punjab.*" December. Accessed July 14, 2025.

Sinha, V., A. M. Michalak, and B. Balaji. 2022. "*India's Riverine Nitrogen Runoff Strongly Impacted by Monsoon Variability.*" July 27. Accessed July 14, 2025.

Kumar, Shyam, and Gaurav Kori. 2024. "*The Impact of Minimum Support Price (MSP) on Crop Residue Burning (CRB) in Punjab and Haryana: Consequences for Air Quality in Delhi.*" March 29. Accessed July 14, 2025.

Chachei, Katrina. 2024. "*Greenhouse Gas Emissions in the Indian Agriculture Sector and Mitigation by Best Management Practices and Smart Farming Technologies: A Review.*" June 29. Accessed July 14, 2025.

Chakraborty, Tanmay, Arpit Gupta, and Raghuram Rajan. 2024. "*The Equilibrium Impact of Agricultural Support Prices and Input Subsidies.*" September. Accessed July 14, 2025. https://dp.ashoka.edu.in/ash/wpaper/paper123_0.pdf

Sudhakar, K., S. Lakshmi, and R. M. Reddy. 2017. "*Minimum Support Prices and Its Impact on Agricultural Economy.*" June. Accessed July 14, 2025. https://www.researchgate.net/publication/378900517_Minimum_Support_Prices_and_Its_Impact_on_Agricultural_Economy

Harsana, Ritu, Nidhi Goyal, and Ankit Chauhan. 2024. "*Minimum Support Price Conundrum and Sustainable Farming: A Study of the Impact of the Socio-Economic Factors on Sustainable Agriculture.*" July. Accessed July 14, 2025. https://www.researchgate.net/publication/360472827_Minimum_Support_Price_Conundrum_and_Sustainable_Farming_A_study_of_the_impact_of_the_socio-economic_factors_on_sustainable_agriculture

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

Janna, R., Priyanka Das, and Anjali Sharma. 2024. "*Legal Guarantee of Minimum Support Price (MSP) and Indian Agriculture—Issues and Options.*" September. Accessed July 14, 2025. https://www.researchgate.net/publication/384645934_Legal_Guarantee_of_Minimum_Support_Price_MSP_and_Indian_Agriculture-_Issues_and_Options

Das, Raya. 2020. "*Minimum Support Price in India: What Determines Farmers' Access*?" Accessed July 14, 2025 https://ageconsearch.umn.edu/nanna/record/304157/files/07-Raya-Das.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1

"Farmers Protest: MSP Law Demand Is Connected to an Environmental Crisis—Here's How." Scroll.in. Accessed March 30, 2025. https://scroll.in/article/1063821/the-farmers-demand-for-an-msp-law-is-linked-to-an-environmental-crisis-heres-how.

Mathur, Rachita, Meha Jain, and David Lobell. "A Systems Analysis of Sustainability Impacts of Agricultural Policies in India." *AGU Advances* 5, no. 1 (2024). https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2023EF003667.

"Food Security and India's Minimum Support Price (MSP) Policy." Innovapolis. Accessed March 30, 2025. https://innovapolis.ca/food-security-and-indias-minimum-support-price-msp-policy/.

Singh, Karan. "MSP Policy Is Driving Unsustainable Paddy Cultivation in Punjab." *Down To Earth*. Accessed March 30, 2025. https://www.downtoearth.org.in/blog/agriculture/msp-policy-is-driving-unsustainable-paddy-cultivation-in-punjab-83173.

"A Shift to Less Water Intensive Crops May Be the Key to Protecting Farmer Lives." *The Wire*. Accessed March 1, 2025. https://thewire.in/agriculture/a-shift-to-less-water-intensive-crops-may-be-the-key-to-protecting-farmer-lives.

"Groundwater Depletion in Haryana a Cause of Serious Concern." *Mongabay India*, July 28, 2021. Accessed March 1, 2025. https://india.mongabay.com/2021/07/groundwater-depletion-in-haryana-a-cause-of-serious-concern/.

"Fears for Farming: Groundwater Plummets in Northern India." *Dialogue Earth*. Accessed March 1, 2025. https://dialogue.earth/en/food/fears-for-farming-groundwater-plummets-northern-india/.

"Punjab's Water Depletion Crisis." *Saving Punjab*, March 3, 2023. Accessed March 1, 2025. https://savingpunjab.org/2023/03/03/punjabs-water-depeletion-crisis/.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

"Groundwater Crisis." *The Tribune*, 2023. Accessed March 1, 2025. https://www.tribuneindia.com/news/editorials/groundwater-crisis/.

"How Single Crop Farming Is Harming Wildlife." *World Economic Forum*, 2015. Accessed March 1, 2025. https://www.weforum.org/stories/2015/05/how-single-crop-farming-is-harming-wildlife/.

"Central India's Green Cotton Gently Weaves Its Web." *Le Monde*, September 5, 2024. Accessed March 1, 2025. https://www.lemonde.fr/en/environment/article/2024/09/05/central-india-s-green-cotton-gently-weaves-its-web_6724956_114.html.

"Soil in Kerala's Monoculture Plantations Less Healthy, Productive Than Natural Forests: Study." *Mongabay India*, September 15, 2021. Accessed March 1, 2025. https://india.mongabay.com/2021/09/soil-in-keralas-monoculture-plantations-less-healthy-productive-than-natural-forests-study/.

"Monoculture Farming." *Federation of Seed Industry of India*. Accessed March 1, 2025. https://fsii.in/monoculture-farming/.

"Monoculture Farming: Boon or Bane?" *Federation of Seed Industry of India*. Accessed March 1, 2025. https://fsii.in/monoculture-farming-boon-or-bane/.

"India Stat Karnataka – 'Tomato Production Data for All Years.'" *India Stat Karnataka*. Accessed March 1, 2025. https://www.indiastatkarnataka.com/Karnataka-state/data/agriculture/tomato/data-year/all-years.

"Tomato Prices" *Napanta*. Accessed March 1, 2025. https://www.napanta.com/agri-commodity-prices/karnataka/tomato/13-Sep-2022/.

"Tomato Tombola Turns Karnataka Farmers Crorepatis as Prices of Red-Hot Crop at All-Time High." *News18*, July 20, 2023. Accessed March 1, 2025. https://www.news18.com/india/tomato-tombola-turns-karnataka-farmers-crorepatis-as-prices-of-red-hot-crop-at-all-time-high-8441035.html.

"Wheat Production in Karnataka." *Statista*. Accessed March 1, 2025. https://www.statista.com/statistics/1019619/wheat-production-in-karnataka-india/.

"Tomato Rates Drop in Karnataka Markets as Excessive Production Leads to Glut." *The Hindu*, August 12, 2024. Accessed March 1, 2025. https://www.thehindu.com/news/cities/bangalore/tomato-rates-drop-in-karnataka-markets-as-excessive-production-leads-to-glut/article68536443.ece.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

"Procurement Price of Wheat in India." *Statista*. Accessed March 1, 2025. https://www.statista.com/statistics/936708/india-procurement-price-of-wheat/.

Bhargava, Rajesh. "Impact of Monoculture Farming in Karnataka." *International Journal of Creative Research Thoughts* 6, no. 4 (2018): 567–78. Accessed March 1, 2025. https://www.ijcrt.org/papers/IJCRT1892689.pdf.

"MSP & Pollution: Two Sides of Same Coin." The Economic Times. Accessed March 30, 2025. https://m.economictimes.com/news/india/msp-pollution-two-sides-of-same-coin/articleshow/96137884.cms.

"Environmental and Health Effects Add Billions in Hidden Costs to India's Public Distribution System." Tata-Cornell Institute for Agriculture and Nutrition. Accessed March 30, 2025. https://tci.cornell.edu/?news=environmental-and-health-effects-add-billions-in-hidden-costs-to-indias-public-distribution-system.

"Impact of Minimum Support Price (MSP) on the Agricultural Economy: A Comprehensive Analysis." ResearchGate. Accessed March 30, 2025. https://www.researchgate.net/publication/385003047_Impact_of_Minimum_Support_Price_MSP_on_the_Agricultural_Economy_A_Comprehensive_Analysis.

Salvi, Pratik. "India's Minimum Support Price (MSP) Mechanism: Striking a Balance Between Farmer Income and Environmental Sustainability." *Medium*. Accessed March 30, 2025. https://medium.com/@pratikgsalvi03/indias-minimum-support-price-msp-mechanism-striking-a-balance-between-farmer-income-high-f0757fe06b71.

"Minimum Support Prices for Agricultural Commodities in India: Do Price Floors Really Matter?" Farmdoc Daily. Accessed March 30, 2025. https://farmdocdaily.illinois.edu/2022/12/minimum-support-prices-for-agricultural-commodities-in-india-do-price-floors-really-matter.html.

MSP and Public Procurement." PRS Legislative Research. Accessed March 30, 2025. https://prsindia.org/theprsblog/msp-and-public-procurement?page=2&per-page=1.

"Promise and Perils of Legalizing MSP." *Drishti IAS*. Accessed March 30, 2025. https://www.drishtiias.com/daily-updates/daily-news-editorials/promise-and-perils-of-legalizing-msp.

"MSP Can Be Legalised, but at Crippling Cost to Economy, Environment." *Moneycontrol*. Accessed March 30, 2025. https://www.moneycontrol.com/news/business/msp-can-be-legalised-but-at-crippling-cost-to-economy-environment-12271971.html.

ISSN: 2455-8834

Volume:10, Issue:07 "July 2025"

"It's Time to Reimagine MSP for Better Ecology and Economy." *India Today*. Accessed March 30, 2025. https://www.indiatoday.in/opinion/story/its-time-to-reimagine-msp-for-better-ecology-and-economy-opinion-farmers-protest-2506262-2024-02-23.

"Minimum Support Price (MSP)." *PMF IAS*. Accessed March 30, 2025. https://www.pmfias.com/msp/.

"Make MSP Policy SDG Conscious." *Deccan Herald*. Accessed March 30, 2025. https://www.deccanherald.com/opinion/make-msp-policy-sdg-conscious-2932083.

