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ASSESSING THE IMPACT OF AGRICULTURAL SUBSIDIES ON ENVIRONMENT

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Abstract

Agriculture plays a very important role in the development of the economy of India. It provides food more than 1.4 billion people and total employment to 58% of Indian and contributed 19-20 % in the country's GDP. For the growth of this sector government provide different type agricultural subsidies in the direct and indirect forms. But the main question is to know that how much beneficial is this to the agriculture sector. This paper provides an overview of the agricultural subsidy with the help of funds allocated to agricultural sector under various schemes. The authors also study various types of agricultural subsidies and their distribution system in India. This paper is based on the secondary data which are collected from the different government and research institution publications and researchers. The subsidies are very helpful in the growth of the agriculture sector but due to mismanagement it does not reach to the end users.

Keywords: Agriculture, Subsidies, India, Environment.

Introduction

India is an agriculture based country and it has significant part in national income. More than 60 percent of population is depends on the agriculture for the income as it provide employment around 58 percent people (GOI). As agriculture is important sector, it requires special attention so that proper growth can be possible. In recent years government focused more on industrial sector which led to decline in the contribution of agriculture sector. So it is important to improve the growth of this sector (Kumar, 2020). Government play important role in the development of the agriculture sector, it provides different kind of financial and technical support to insure self-sufficiency, to provides technical support to small scale[1] producer in adoption of modern technology, to maintain price stability, employment creation and to increase the income of farmers. Government form various policies to provide assistant to agriculture like export -import policy for the agricultural product and domestic policy like minimum support price (MSP), subsidized inputs to provide cost benefits, direct payment and insure availability of inputs like fertilizer, water, seeds etc. In general agricultural subsidies are financial support given by the government to the farmers and other agribusiness to enhance the income of the farmers (salunkhe & Deshmush, 2012). According to WTO, subsidy means a financial contribution given by the government and any public body which provide benefit to the general public. Subsidies can bring economic benefits to agriculture. Input subsidies provide inputs to the farmer at affordable price

like fertilizer, water and electricity. These input subsidies have very essential part in overall agriculture subsidies. The subsidies can be in the form of cash payments to the producers or tax rebate on the import and export of the agricultural product. This study focuses on the overview of the agricultural subsidies, its different types and criteria of its distribution.

Review of Literature

As agricultural subsidy is most debatable issue in the world. Many researchers have presented their thought on the agricultural subsidies on the national as well as international level through research papers and articles.

Swaminathan (1975) highlight the role of subsides in promoting the adoption of high –yielding crop varieties and modern farming practices, which led to increased food production. This period marked the beginning of the government's intervention in agricultural markets through price support, input subsidies, and credit facilities.

Gulati et al. (2005) and Kumar and Joshi (2018) have examined the relationship between agricultural subsidies and productivity. While some argue that subsidies have played a crucial role in increasing crop yields and food security. Others have raised concerns about their efficiency and the unintended consequences, such as soil degradation and excessive water use.

Mathur et al. (2006) examined the trends in the growth of agriculture production in India and factor affects its growth. The results of the study showed growth in Indian agriculture sector has a declining trend during the study period. Authors suggested that for the future growth of the agricultural sector government need to increase its expenditure by 10 to 15 percent and provides basic infrastructure to the rural area.

Kaur and Sharma (2012) have examined the agricultural subsidy in India during the time period 1980-81 to 2008-09. They consider input subsidy like fertilizer, seed, electricity, irrigation and machinery subsidy. The result showed increasing trends in all these subsidies during the study period. There is a need to form rational policy for to improve the efficiency of agricultural subsidy.

Salunkhe and Deshmush (2012) tried to seek insight about the agricultural subsidies and their distribution in India. This study was based on the secondary data. The conclusion of the study showed that government of India provides many types of subsidies to the agriculture. It also showed that the trends of the investment in agriculture has been increased but at the same time total cultivated area also increased. Authors suggested that policy maker should focus more on the agriculture sector so that growth for the same can be possible.

Gautam (2015) review the argument for and against the agricultural subsidy. Effectiveness of the program depend on the three issues, targeting the needed people other than who want subsidies, second one is it should be effective by the insuring positive impact and reducing wastage. Third on is, it should be sustainable by reduce environmental footprint.

Lovelace and Diamond (2017) discussed about the supply management and subsidy in agriculture. They provide some insight about the US farm bill through the Polonyian and Food regime Political-economic theories. In the conclusion authors revealed that there were some

problems associated with the supply management, farm policy and over production. There should be effective supply management policy to resolve the resolve the over production. It was suggested that a supply coordination policy need to be address and cross border alliance could help in export of food commodities. Farmers need to understand the supply management in agriculture.

Anand and Sha (2020) investigated the importance of the agricultural subsidies in India. The factors that studied were agricultural finance, irrigation, production, infrastructure and technology. The study shows that the agriculture subsidy was helpful for the growth of the agriculture sector but the some mismanagement, corruption and hurdle in the distribution system make it difficult to reach the benefit to the real beneficiary.

Kumar (2020) examined the impact of agricultural subsidies on the agriculture sector in India. It was a review based study. The conclusion of the study revealed that various study recommended the withdrawal of agricultural subsidies because that fund can be used in other development activities. But it also create fear of reduction in agricultural production and income of the farmers. Author suggested that government should frame such policy which makes distribution of agricultural subsidies more transparent and policy should be farmers friendly. It will helpful in the increase of production and income of farmers.

Objective of the Study

The objective of the study is to examine the budgetary allocation and expenditures associated with the agricultural subsidies and its impact on the environment.

Agriculture Sector in India

Focus of the study is to know the state of agriculture sector through the subsidy provided by the central and state. Agriculture was the top in the list to contribute in the Indian GDP. Now agriculture is third largest contributor to the Indian GDP, with 20.19% share, following to service sector (53.89%) and Industry sector (25.92%). Government provides different types of financial assistant to the agriculture by various schemes. India has two departments under the ministry of agriculture and farmers' welfare first one is Agriculture, Cooperation and Farmers' Welfare and second is Agricultural Research and Education. First is responsible for the implementation of policies and program to manage agriculture inputs and crops husbandry and latter is responsible for the promotion of agricultural research and education. Agricultural ministry allocated 14% more fund in 2021-22 as compared to 2019-20. During budget speech finance minister announced some proposal relating to agriculture like for financing the agricultural infrastructure, agriculture and infrastructure development cess will be levied on certain imported goods. Fund for the agriculture infrastructure will be given to the Agriculture produce Market Committees (APMCs). More than 1000 mandies will integrated by electronic National Agriculture Market (e-NAM). Under the Operation Green Schemes, in which subsidy is given for storage and transportation of the potato, tomatoes and onions, now it cover 22 perishable goods for the support value edition and export.

Investment in Agriculture Sector

Capital investment in the agriculture sector shows increasing trends. it was Rs. 273870 crore in 2011-12 to reaches at Rs. 557570 crore in 2020-21. This increase depicts the government intention to insure growth in agriculture and sustainability in agriculture sector. Gross Capital Formation (GCF) is the indicator for the capital investment in relation to the Gross Domestic Product (GDP).

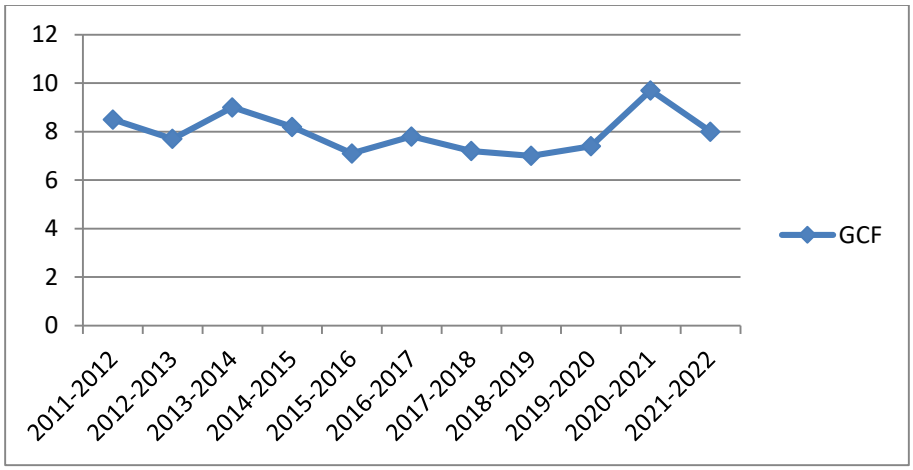

Figure 1: Gross Capital Formation (GCF) in Agriculture & Allied sector at Current Prices

Source*:* Agricultural Statistics at a Glance, 2021

The above figure shows the share of GCF in the agriculture & Allied sector. it is observed that capital investment has increased but the share of agriculture and allied sector has been decreased from 2011-12 (8.5) to 2019-20 (7.4). It further increases in the year 2020-21(9.7).

Table 1. Fund allocated by the Ministry of agriculture to the departments

Department	2021-22 Actuals	2022-23 Revised	2023-24 Budget	% change (annualised) in 2023-24 over 2021-22
Agriculture, Cooperation and Farmers' Welfare	1,14,468	1,10,255	1,15,532	5%
Agricultural Research and Education	8368	8,659	9,504	10%
Ministry	**1,22,836**	**1,18,913**	**1,25,036**	**5%**

Source: Demand for Grants 2023-24 Analysis**.**

As shown in table 1, fund distributed in different department. Agriculture, cooperation and Farmers' Welfare received around 94 % of total fund and Agricultural Research and Education received 6 %. Fund allocated in 2021-22 budget, is 14% more than the fund allocated in 2019-20 budget for the Department of Agriculture, Cooperation and Farmers' Welfare. For the Agricultural Research and Education this increase is 6 %. This shows that government is looking forward to boost the agriculture through the increased (14%) financial assistance.

Table 2. Allocation of funds in the Department of Agriculture, cooperation and Farmers' Welfare (Rs. crore)

Schemes	2020-21 Actuals	2021-22 Budgeted	2021-22 Revised	2022-23 Budgeted	% change in BE 2022-23 over RE 2021-22
PM-KISAN	60,990	65,000	67,500	68,000	1%
Interest subsidy for short-term credit to farmers	17,790	19,468	18,142	19,500	7%
Pradhan Mantri Fasal Bima Yojana	14,161	16,000	15,989	15,500	-3%
Pradhan Mantri Krishi Sinchai Yojana (Per Drop More Crop)	2,562	4,000	2,000	-	-
Market Intervention Scheme and Price Support Scheme (MIS-PSS) *	1,358	1,501	3,596	1,500	-58%
Agriculture Infrastructure Fund	22	900	200	500	150%
Formation and Promotion of 10,000 Farmer Producer Organisations	241	700	250	500	100%
Green Revolution/ Rashtriya Krishi Vikas Yojana	9,748	13,408	8,889	17,616	98%
Department	**1,08,273**	**1,23,018**	**1,18,294**	**1,24,000**	**-4%**

*for procurement of pulses and oilseeds

Sources*:* Demand for Grants 2022-23 Analysis**.**

Government provides financial support to the agricultural sector through various schemes. These schemes are beneficial for the farmers. The purpose of the financial support is to improve productivity and increase the income of farmers. As table 2 shows that around 83% of the department has been proposed to spend on three income support schemes. These schemes were

PM-KISAN (55%), interest subsidy on short term credit to farmers (16%) and Pradhan Mantri Fasal Bima Yojana (13%). Expenditure on the agriculture shows a declining trend. But the grated rise is found in the schemes like Agriculture Infrastructure Fund (150%), Formation and Promotion of 10,000 Farmer Producer Organisations (100%), Green Revolution/ Rashtriya Krishi Vikas Yojana (98%). Government reduced expenditure on the schemes like Pradhan Mantri Fasal Bima Yojana (-3%) and Market Intervention Scheme and Price Support Scheme (MIS-PSS) (-58%). These trends show decrease (-4%) in the overall allocation of fund to the Department of Agriculture, cooperation and Farmers' Welfare.

Table 3. Allocation of funds in the Department of Agricultural Research and Education (Rs. crore)

	2020-21 Actuals	*2021-22 Budgeted*	*2021-22 Revised*	*2022-23 Budgeted*	*% change (annualised) in BE 2022-23 over 2021-22*
ICAR headquarters	4,985	5,322	5,561	5,877	6%
Crop sciences	805	968	840	719	-14%
Agricultural education	526	613	553	455	-18%
Central agricultural universities	455	471	563	599	6%
Animal sciences	400	462	400	343	-14%
Department	**7,554**	**8,514**	**8,514**	**8,514**	**0%**

Sources: Demand for Grants 2022-23 Analysis: Agriculture and Farmers' Welfare

Table 3 shows the fund allocated to the department of Agricultural Research and Education. In 2022-23 around 69% of total fund of the department is allocated to the Indian Council of Agricultural Research (ICAR). But there is no change in the fund allocated for the Agricultural Education (0%). Highest fund are allocated under ICAR headquarter head (69%).

Table 4. Distribution of subsidies & Gross Cropped Area in India (2000-2021)

Year	Fertilizer (Rs. Crore)	Electricity (Rs. Crore)	Irrigation (Rs. Crore)	Total Subsidies (Rs. Crore)	Gross Cropped Ares (in million hectares)
2000-01	13800 (24.88)	26950 (48.59)	14711.71 (26.53)	55461.71 (100.00)	185.34
2005-06	18460 (45.15)	12490.6 (30.55)	9933.09 (24.30)	40883.69 (100.00)	192.74
2010-11	62301 (61.07)	30,332 (29.73)	9374.54 (9.19)	102007.54 (100.00)	197.68
2015-16	72415 (39.55)	91000 (49.79)	19330.44 (10.57)	182,745 (100.00)	197.05

2020-21	133947 (53.35)	100754 (40.13)	16344.07 (6.51)	251045.07 (100.00)	196.50

Source: (1) Fertilizer association of India, various issues

(2) Ministry of Agriculture & Farmers Welfare, GOI, PIB,

(3) Agricultural Statistics at a Glance, 2021,

(4) Central Electricity Authority, GOI, various years

(5) Central Water Commission, 2021

Note: Percentages are shown in parentheses

The above table shows that total subsidies increases year by year. The amount was Rs. 55461.71 crore in the year 2000-01, that reached to 251045.07 crore in the year 2020-21. In the context of Gross Cropped area also shows increasing trends, it was 185.34 million hectares in the year 2000-01 and 196.50 million hectares in 2020-21. As the gross cropped area increase but the population of India also increased (Salunkhe and Deshmush, 2012). The data shows there is great change in the share of three subsidies in total subsidy. The share of the fertilizer subsidy increase from 24.88% in 2000-01 to 53.35% in the year 2020-21 and canal irrigation subsidy share reduced to 26.53% to 6.51% in the year 2000-01 and 2020-21 respectively

Environmental impact of Agricultural Subsidies

Like many other countries, agricultural subsidies in India have both Positive and negative environmental impacts. These impacts can vary depending on the type of subsidy, how it implemented and distributed. There are some key environmental impacts of agricultural subsidies in India:

1. **Increased food production**: Subsidies can help increase food production, ensuring food security for the growing population like India. This can reduce the pressure on natural ecosystems caused by land conversion for agriculture (Kumar, 2022).
2. **Technology adoption**: Some subsidies promote the adoption of modern and sustainable agricultural practices, such as the use of high-yield crop varieties and efficient irrigation systems. These practices can lead to higher agricultural productivity with lower resource use (Potter and Tilzey, 2007).
3. **Livelihood Support**: By providing financial support to farmers, subsidies can help maintain rural livelihood, reducing migration to urban areas and the associated urbanization and environmental pressures (Salunkhe, 2016).
4. **Overuse of resources**: subsidies like fertilizers and water can lead to their overuse, which can result in soil degradation, water pollution and loss of biodiversity. Excessive use of chemical fertilizer can lead to nutrient runoff and soil contamination (Singh, 2000).
5. **Monoculture and Biodiversity Loss:** Subsidies that encourage the cultivation of a few high-yield crop varieties can lead to monoculture farming, which is detrimental to biodiversity. It reduces the diversity of crops, making agriculture more susceptible to pests and diseases (Singh, 2000).

6. **Water Depletion:** Subsidized irrigation can lead to excessive groundwater pumping, depleting aquifers and causing long-term water scarcity. This is a significant concern in regions with heavy agricultural subsidies (Badiani and Jessoe,2019).
7. **Deforestation:** in some cases, agricultural subsidies have been linked to deforestation as farmers clear forest to expand agricultural land.
8. **Greenhouse Gas Emission**: Intensive agricultural practices supported by subsidies can contribute to greenhouse gas emissions, primarily through the use of fossil fuels for machinery and release of methane from livestock (Baig et al., 2023).
9. **Waste and pollution**: subsidies can lead to wasteful practices, such as overproduction of certain crops that are then discarded, contributing to food waste. Additionally, the improper disposal of agricultural waste, including plastics and chemicals, can cause pollution (Demirbas, 2009).
10. **Climate Change:** The contribution of agriculture to greenhouse gas emissions is significant. Methane emissions from livestock and nitrous oxide emissions from fertilizer use are particularly concerning. Sustainable farming practices promoted through subsidies, such as agro-forestry, organic farming, and low-emission livestock management, can help reduce these emissions and contribute to climate change mitigation (Baig et al., 2023 and Mowbray).

Conclusion

India makes lot of investment in agriculture in few part years and has a huge arable land. There is increasing trends in the allocation of agricultural subsidies but at the same time gross cropped area also shows increasing trends. After all these efforts agriculture sector has slow growth rate of the agriculture sector.

The positive sides of the agricultural subsidies are it can stabilize food and ensure a consistent food supply, which is crucial for food security. It also supports the livelihoods of the farmers and rural communities. Additionally, subsidies can incentivize the adoption of sustainable farming practices and promote environmental conservation. However, there are also some drawbacks to agricultural subsidies. They can distort market force, overproduction of certain crop and discouraging innovation. Therefore, the effectiveness of the agricultural subsidies largely depends on their design, implementation, and the specific goal they aim to achieve. The policymakers should carefully consider the social, economic and environmental impacts of these subsidies and strive to strike a balance that supports farmers while promoting sustainability, market fairness, and fiscal responsibility.

References

Anand, R., & Sha, U. (2020). Impact of Subsidies on Indian Agriculture Sector: An Analysis. *Journal of Emerging Technologies and Innovative Research*, 7(5), 457-462.

Badiani, & Jessoe, (2019). Electricity Prices, Groundwater, and Agriculture: The Environmental and Agricultural Impacts of Electricity Subsidies in India. *Electricity Prices, Groundwater, and*

Agriculture: The Environmental and Agricultural Impacts of Electricity Subsidies in India, pp.157-183.

Baig, I.A., Irfan, M., Salam, M., & Isik, C. (2023). Addressing the effect of meteorological factors and agricultural subsidy on agricultural productivity in India: a roadmap toward environmental sustainability. *Environmental Science Pollution Research*, 30, 15881–15898.

Demirbas, A. (2009). Political, Economic and Environmental Impacts of Biofuels: A review. *Applied Energy*, 86(1), 108-117.

Gautam, M. (2015). Agricultural subsidies: Resurging Interest in a Perennial Debate, Indian *Journal of Agricultural Economics*, 70(1), 83-105.

Kaur, R., & Sharma, M. (2012). Agricultural Subsidies in India Boon or Curse. *IOSR Journal of Humanities and Social Science*, 2(4), 40-46.

Kumar, S. (2020). Impact of Subsidies on Agriculture Sector in India. *Agri mirror: Future India*, 1(2), 40-44.

Kumar, M. B. (2022). Analysis of growth rates of agricultural subsidies and capital formation in agriculture sector of India. The *Pharma Innovation Journal*, 11(8), 1775-1780.

Lovelace, G.G. (2017). Diamond A. From Supply Management to Agricultural Subsidies- and Back Again? The US Farm Bill & Agrarian (in) Viability. *Journal of Rural Studies*, 50, 70-83.

Mathur, A.S., Das, S., & Sircar, S. (2006). Status of Agriculture in India: Trends and Prospects. *Economic and Political Weekly*, 41(52), 5327-5336.

Mowbray, A. (2022). The Impact of High-Emission Food Subsidies on Global Warming in India, available at https://www.worldfoodprize.org/documents/filelibrary/youth_programs/2022_gyi_student_papers/Mowbray_Ash_Margot_F36E202EF9582.pdf

Potter, C., & Tilzey, M. (2007), Agricultural multifunctionality, environmental sustainability and the WTO: Resistance or accommodation to the neoliberal project for agriculture?. *Geoforum*, 38(6), 1290–1303.

Salunkhe, H.A., & Deshmush, B.B. (2012). The overview of Government subsidies to agriculture sector in India. *IOSR Journal of Agriculture and Veterinary Science*, 1(5), 43-47.

Salunkhe, H.A. (2006). A Study of Agriculture Subsidy and its Impact on Agriculture Sector with Reference to Jalgaon District. *Pratibha: International Journal of Science, Spirituality, Business and Technology*, 5(1), 6-10.

Singh, R.B. (2000). Environmental consequences of agricultural development: a case study from the Green Revolution state of Haryana, India. *Agriculture, Ecosystems & Environment*, 82(1-3), 97-103.