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IMPACT OF AGRICULTURAL SUBSIDIES ON PRODUCTION: A CASE STUDY OF BAGALKOT DISTRICT IN KARNATAKA STATE

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ABSTRACT----------
Agriculture continues to play a vital role in India's economic development by contributing significantly to gross domestic product, employment generation, and food security. Despite structural shifts toward industry and services, a large proportion of the population still depends on agriculture for livelihood, making policy support crucial for sustaining productivity and farm incomes. In this context, agricultural subsidy schemes particularly equipment and mechanization subsidies have emerged as important policy instruments to enhance efficiency, reduce labour dependence, and promote the adoption of modern technologies. The present study examines the Impact of Agricultural Subsidies on Production: A Case Study of Bagalkot District in Karnataka State. The study adopts both descriptive and analytical approaches and is based on primary and secondary data. Primary data were collected from 384 beneficiary farmers using a simple random sampling technique through a structured interview schedule, while secondary data were sourced from government reports, economic surveys, and published literature. The analysis focuses on major equipment subsidy schemes such as SMAM, RKVY, PM Kisan Tractor Yojana, and NABARD loans. The findings reveal that agricultural equipment subsidies have significantly contributed to increased crop production, reduced labour costs, saved time in farming operations, and improved market access for farmers. A majority of respondents strongly agreed that subsidies helped enhance productivity and operational efficiency. The study also highlights the predominant use of subsidized equipment for land preparation and harvesting activities. Despite the positive impact, issues related to awareness, accessibility, and procedural delays persist. The study concludes that agricultural equipment subsidies play a crucial role in improving farm productivity and farmers' socio-economic conditions in the study area, and it suggests strengthening awareness campaigns, simplifying procedures, and ensuring inclusive access for small and marginal farmers to maximize policy effectiveness.

KEY WORDS: *Agriculture, Subsidy, Equipment, Mechanization, Production,* ----------

I. INTRODUCTION

The agricultural sector plays a crucial role in developing economic growth like India due to its large share of GDP, employment opportunities, and its strong linkage with the rest of the economy. A strong relationship between GDP and agricultural sector. Its share in the GDP is still as high as 18.2 percent. Nearly 42.3percent of the population depends on farming areas and the growth agriculture sector. As reflected in an average annual growth rate of 4.18 per cent at constant prices during the past five years. However, according to provisional estimates for 2023–24, the sector's growth moderated to 1.4 percent. The production contribution of this sector remains significantly important. The share of food in consumer expenditure constitutes 46 percent in rural areas and 39 percent in urban areas. The demand for food grows with the growth of population, raw materials for industry and income.

Food grains production in India has exhibited a generally positive trend during the recent period, reflecting the resilience of the agricultural sector. Production increased from 310.7 million tonnes in 2020–21 to 315.6 million tonnes in 2021–22, registering a growth of about 1.6 per cent. This upward trend strengthened further in 2022–23, with output rising to 329.7 million tonnes, representing a significant increase of nearly 4.5 per cent over the previous year. However, as per provisional estimates for 2023–24, food grains production marginally declined to 328.9 million tonnes, indicating a slight contraction of about 0.2 per cent. Overall, the data suggest that while food grains production has expanded during the period under review, it has also been subject to year-to-year fluctuations influenced by climatic conditions and input-related constraints.

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II. MEANING OF SUBSIDY

A subsidy refers to financial or material assistance provided to farmers to enhance agricultural production through the supply of inputs such as planting material, improved seeds, fertilizers, pesticides, machinery, and modern equipment, either in direct or indirect forms.

III. TYPES OF AGRICULTURE EQUIPMENT SUBSIDIES SCHEMES

1. RKVY
2. SMAM
3. NABARAD Loan in India
4. PM Kisan Tractor Yojana
5. Namo Drone Didi (Under SMAM Scheme)

IV. REVIEW OF LITERATURE

Shadman Zafar, andTarique (2023) This article's main purpose of to figure out the relative effectiveness of alternate public expenditure on agricultural development particularly in the growth mainly in the background of input subsidies. The authors also effort to test the applicability of the crowding-out suggestion in the present article. The author's point of view public investment is more productive than input subsidies for overall agricultural growth.

Shumiao Ouyang and Jinlong (2024) This article will use the region of Jilin as an example to evaluate and optimise the efficiency of the equipment in the province, which will help guide the specific implementation of the subsidy for the purchase of agricultural machinery. The scope of the agricultural machinery purchase subsidy is expanding, some provinces have tight funds, some have a structure of using subsidy funds that does not match the structure of the agricultural industry in the province, and many other issues. Therefore, it is necessary to study the effect of the use of the central financial funds of the agricultural machinery purchase subsidy.

Alexandra, and Grigorios,et..al. (2024) A study on support of sustainable development, this study aims to thoroughly assess recent research on the features of agricultural entrepreneurship in Greece. It also explores aspects that significantly influence entrepreneurship in the farming sector. The study carried out among Greek agribusiness owners in the western region, develops concepts and practical strategies for future researchers. The main topic of discussion is the importance of agricultural entrepreneurship in sustainable development. The study highlights issues, points out areas in need of more research, and offers suggestions for directing future investigations toward fostering sustainable agricultural entrepreneurship in the evaluated area.

V. OBJECTIVES OF THE STUDY

1. To ascertain the Agricultural Equipment Subsidies in the study area.
2. To assess the Impact of Agricultural Equipment Subsidies on Farmers Crop Yield and farm Income.
3. To analyze the Effectiveness of Agricultural Equipment Subsidy Programs in the study area.

VI. HYPOTHESES

Type of Subsidy Scheme

- **H_0 2:** There is no significant association between the type of equipment subsidy scheme and type of equipment benefit received by the respondents.
- **H_1 2:** There is a significant association between the type of equipment subsidy scheme and the type of equipment benefit received by the respondents.

Production and Family Income

- **H_0 3:** Agricultural subsidies have no significant impact on the increase in farmer's production and family income.
- **H_1 3:** Agricultural subsidies have a significant positive impact on the increase in farmer's production and family income.

VII. RESEARCH METHODOLOGY

The present study adopts both descriptive and analytical research approaches and is based on the use of primary as well as secondary data. Primary data were collected directly from the respondents by adopting a simple random sampling technique to ensure representativeness. A structured interview schedule was used to conduct a field survey and to obtain reliable and relevant information from the selected sample units. The primary survey helped in

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capturing firsthand data on the variables relevant to the study. Secondary data were collected to supplement and support the primary findings. These data were obtained from various published and official sources such as books, research articles, and academic journals and other sources.

Sample Size

The present study considered all beneficiaries in the district from 2018 to 2025 as the target population, and the sample was selected using the simple random sampling method. The sample size was determined through the Creative Research system's online sample size calculator at a 95 percent confidence level and a 5 percent confidence interval. Bagalkot District comprises nine taluks, and respondents were chosen form four taluks based on the number of agricultural equipment subsidy schemes are provided to below poverty line farmer's as well as small, marginal, semi-medium, and large farmers, the study included beneficiaries as respondents to assess how the use of modern agricultural tools has helped reduce costs and impact of production levels in Agricultural sector of Bagalkot District in Karnataka state.

$$S = \frac{X^2 N P (1 - P)}{d^2 (N - 1) + x^2 P (1-P)} \quad \ldots\ldots\ldots\ldots (1)$$

$$S = \frac{3.84^2\ 2,50,010\ (0.50)\ (1-0.5)}{(0.05)^2\ (2,50,010 -1)\ + (3.84)\ (0.5)\ (1-0.5)}$$

$$S = \frac{3.84^2\ 2,50,010\ (0.25)}{(0.0025)\ (2,50,0009)\ +\ (3.84)\ (0.25)}$$

$$S = \frac{2,40,009.6}{625.0225\ +\ 0.96}$$

$$S = \frac{240,0009.6}{625.9825}$$

$$S = 383.41$$

$$\boxed{S=384}$$

Table: 1 Agriculture Sector –Key Indicators

Sl.No	Item	2023-24	2024-25
1	**GDP - share and growth** (per cent at 2011-12)		
	Growth in GDP in Agriculture & Allied sectors	2.0	3.5
	Share in GDP Agriculture and Allied sectors	17.8	18.4
	Agriculture	17.8	16
	Forestry and logging	7.7	4.6
	Fishing	7.0	8.7
2	**Agricultural Imports and Export** (percent of Current Prices)		
	Agriculture Imports to national Imports	7.9	18.7
	Agricultural Export to national exports	8.2	6.5
3	**Employment i**n the agriculture sector as shear of total		46.1
	Employment in 2024-25 as per Current Daily Status (percent)		

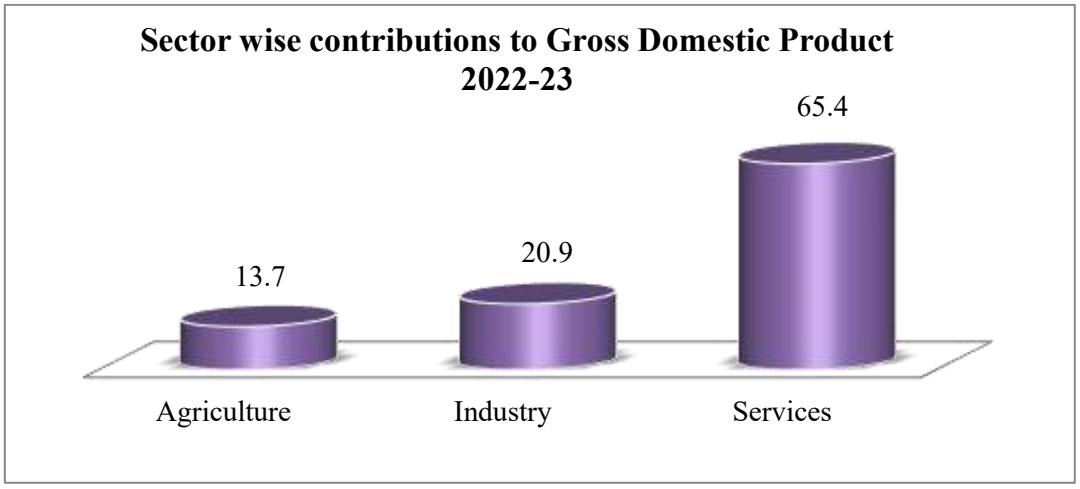
Source: Ministry of Statistics and Programme implementation 2024-25

The table shows recent trends in the agriculture and allied sectors in terms of GDP contribution, trade, and employment. Agricultural GDP growth improved from 2.0 per cent in 2023–24 to 3.5 per cent in 2024–25, indicating a modest recovery. The sector's share in GDP also increased from 17.8 per cent to 18.4 per cent, highlighting its continued economic importance. Agricultural imports as a share of national imports increased substantially, from 7.9 per cent in 2023–24 to 18.7 per cent in 2024–25 The share of agricultural imports in national imports increased

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sharply, while the share of agricultural exports declined, suggesting rising import dependence and export challenges. Despite structural changes in the economy, agriculture remains a major source of employment, accounting for 46.1 per cent of total employment in 2024–25 (Current Daily Status). Overall, the indicators reflect agriculture's sustained role in the economy, alongside persistent productivity and trade-related challenges.

Chart: 1 Sector wise contribution to GDP 2022-23



Source: Karnataka Directorate of Economics and Statistics, Government of Karnataka-2022-23

Chart 3.7 shows that the services sector is the largest contributor to GDP in 2022–23, accounting for 65.4 per cent, indicating a service-led economy. The industrial sector contributes 20.9 per cent, reflecting steady industrial and infrastructure development. The agricultural sector contributes 13.7 per cent; although its share is lower, it remains vital for employment and rural livelihoods. Overall, the data highlights a structural shift from agriculture towards industry and services.

Table: 2 Budgetary Performance Analyses for the Year 2023–24

Item	Outlay (BE)	Anticipated Expenditure (RE)
Agriculture	3022.20	2915.96

Source: Planning, Programme Monitoring and Statistics Department, PFR Division Schemes of Karnataka 2024-25 Vol 1

The table shows the budgetary performance of the agriculture sector in Karnataka for the year 2023–24. An outlay of ₹3022.20 crore was provided in the Budget Estimates (BE), while the anticipated expenditure under Revised Estimates (RE) stood at ₹2915.96 crore. This indicates that a major portion of the allocated funds was utilized during the year.

Table: 3. Outcome for the year 2024-25

Outcome Indicators	Unit	Target 2023-24	Actual Achievement 2023-24	Target Proposed 2024-25
Production of food grains	000MT	14816	12732	14839
Production of oilseeds	000MT	1370	877	1389
Consumption of Chemical Fertilizers	000MT	4381	4000	4461
Seed Distribution	00 0MT	109.2	61.3	104.6

Source: Planning, Programme Monitoring and Statistics Department, PFR Division Schemes of Karnataka 2024-25 Vol 1

VIII. TYPES OF AGRICULTURE SUBSIDIES

1. Fertilizer Subsidy
2. Irrigation Subsidy
3. Power Subsidy
4. Credit Subsidy

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5. Seeds Subsidy
6. Export Subsidy
7. Equipment Subsidy
8. Crop Insurance Subsidy

IX.1 AGRICULTURAL EQUIPMENT AND MECHANIZATION SUBSIDIES

Agricultural equipment and mechanization subsidies support the adoption of farm machinery such as tractors, power tillers, harvesters, seed drills, and other implements. These subsidies help reduce labour dependence, increase operational efficiency, and address labour shortages in agriculture.

X.3 TYPES OF AGRICULTURE EQUIPMENT SUBSIDIES SCHEMES:

1. RKVY
2. SMAM
3. NABARAD Loan in India
4. PM Kisan Tractor Yojana
5. Namo Drone Didi (Under SMAM Scheme)

XI. NABARD Scheme Features and Agricultural Machinery Subsidy Schemes

The agricultural machinery subsidy schemes implemented in India and Karnataka are closely aligned with the core features of NABARD's development and refinancing framework. NABARD plays a pivotal role in enabling access to subsidized farm machinery by integrating financial assistance, institutional support, capacity building, and infrastructure development within a structured policy environment

Table:4 NABARAD Scheme- Interest rates

Loan Type	Interest Rate (%)
Agricultural Loans	7 – 10
Rural Infrastructure Loans	8 – 12
Small-scale Industry Loans	10 – 14

XII. SUB-MISSION ON AGRICULTURAL MECHANIZATION (SMAM)

The Sub-Mission on Agricultural Mechanization (SMAM) aims to promote the adoption of modern farm equipment and machinery to improve the timeliness and precision of agricultural operations. Mechanization reduces input losses, minimizes operational delays, lowers drudgery associated with manual labour, and improves the overall efficiency of farming activities. Further, the use of appropriate agricultural equipment contributes to value addition, improves the quality of farm produce, and enables farmers to realize better market prices.

Table:5 Financial & Physical Progress under SMAM (2018-19 to 31 December 2024)

Source: Annual Report 2024-25 Ministry of Agriculture and Farmers Welfare Government of India

Year	Funds Allocated (₹ Cr)	Revised Allocation (₹ Cr)	Expenditure (₹ Cr)	Trainees Trained	Machines Tested (FMTTI & DA&FW Centres)	Agricultural Machinery Distributed	Custom Hiring Centres Established	Hi-Tech Hubs Established	Farm Machinery Banks Established
2018-19	1,200.00	930.1	1,126.77	11,260	1,557	3,84,911	3,871	106	1,481
2019-20	1,033.34	1,044.57	992.19	10,065	1,213	2,01,769	2,155	60	1,964
2020-21	1,033.09	1,050.34	1,026.63	11,103	1,447	1,32,402	3,979	55	5,453
2021-22	1,080.66	879	844.38	13,575	1,180	93,840	4,612	103	3,420
2022-23	914.73	914.73	1,005.21	15,434	1,064	1,33,806	4,194	72	3,670
2023-24	859.45	859.45	915.8	19,947	984	3,00,761	2,533	119	3,131
2024-25	1,300.00	—	706.36	17,454	419	89,258	1,111	108	584

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Table: 6 Year wise Sale of Tractors and Power Tillers in India

Year	Tractor Sales (Nos.)	Power Tiller Sales (Nos.)
2018–19	8,97,548	51,523
2019–20	7,85,059	46,476
2020–21	9,88,028	54,175
2021–22	9,07,645	53,653
2022–23	9,45,311	55,025
2023–24	8,75,754	51,066
2024–25	6,88,054	40,677

Source: Annual Report 2024-25 from Ministry of Agriculture and Farmers Welfare Government of India

The table shows year-wise sales data indicate a generally stable but fluctuating trend in tractor and power tiller adoption in India. Tractor sales increased significantly in 2020–21, likely reflecting supportive government policies, credit availability, and heightened demand for mechanization during and after the COVID-19 period, before moderating in subsequent years. Power tiller sales followed a similar pattern, with gradual growth up to 2022–23 and a slight decline thereafter. The lower figures reported for 2024–25 (up to November 2024) are partly attributable to the incomplete financial year. Overall, the trends reflect sustained demand for farm mechanization, influenced by policy support, subsidy schemes, and changing labour dynamics in the agricultural sector.

A. Rashtriya Krishi Vikas Yojana (RKVY)

The Rashtriya Krishi Vikas Yojana (RKVY) was launched in 2007–08 as a flagship initiative of the Department of Agriculture and Farmers' Welfare (DA&FW), Government of India. Initially implemented as a State Plan Scheme until 2013–14, RKVY has since been implemented as a Centrally Sponsored Scheme (CSS), with a revised funding pattern of 60:40 between the Centre and States and 90:10 for North-Eastern and Himalayan States, while Union Territories continue to receive 100 percent central funding.

The projects are approved and implemented by the respective State Governments based on their development priorities, resource availability, and the specific needs of farmers, with the objective of achieving holistic growth of the agricultural sector. In Karnataka, the allocation under PM–RKVY for the year 2023–24 amounted to 82.89 crore, while the actual release of funds was 129.52 crore. For the year 2024–25, the allocation remained 82.89 crore, with a fund release of 41.46 crore as of the reporting period. The State-wise number of projects approved during 2023–24 and 2024–25 is provided in this year.

B. Data Anylises in Study Area

a) Under Scheme of Subsidies of Respondents:

Under the scheme of subsidies for respondents, four major types of subsidy programs are implemented in India-SMSAM, RKVY, PM Kisan Yojana, and NABARD Loan in India. These schemes aim to support farmers by providing financial assistance for purchasing equipment, improving agricultural productivity, and promoting sustainable farming practices.

Table-7 Under Scheme of Subsidies of Respondents

Under Schemes of Subsides	No. of Respondents	Percentages
SMSAM	138	35.9
RKVY	124	32.3
PM KISAN Tractor Yojana	37	9.6
NABARAD	85	22.1
Total	**384**	**100**

Source: Field Study Survey-2025

As data Shown in the above table 5.32 in the study area, among total of 384 respondents, 138 (35.9 Percent) respondents benefited Under SMSAM equipment scheme, 124 (32.3 Percent) respondents benefited RKVY equipment scheme, 85 (22.1Percent) respondents benefited NABARAD loan in India equipment scheme, and 37 (9.6 percent) respondents benefited PM Kisan Tractor Yojana.

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C. Impact of Agricultural Subsidies on Farmer's Production and Efficiency:

This section presents the Impact of Agricultural Subsidies on farmers Production and Efficiency, particularly related to equipment used by them. The analysis focuses on four major impacts.1) Subsidies helping to increase production, 2) saving time in farming operations, 3) reducing labour costs, and 4) enabling farmers to reach the market on time. The respondents opinions are classified into five categories, Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree to assess their level of agreement.

Table:8 Impact of Agricultural Subsidies on Farmers Production and Efficiency

Sl. No	Impacts		Strongly Disagree	Disagree	Neutral	Strongly Agree	Agree	Total
1	Subsides helping to Increase Production	F	0	0	0	244	140	**384**
		%	0.0%	0.0%	0.0%	61.9%	35.5%	**100%**
2	Saving Time in farming operation	F	0	0	44	209	131	**384**
		%	0.0%	0.0%	11.2%	53.0%	33.2%	**100%**
3	Reduced labour costs	F	0	0	0	276	108	**384**
		%	0.0%	0.0%	0.0%	70.1%	27.4%	**100%**
4	Enabling farmers to reach the market on time	F	0	0	50	223	111	**384**
		%	0.0%	0.0%	12.7%	56.6%	28.2%	**100%**

Source: Field Study Survey-2025

The above Table-5.46 illustrates the Impact of Agricultural Subsidies on Farmers Production and Efficiency. It is evident that the majority of respondents expressed a high level of agreement with all the listed statements. For the statement Agricultural, subsidies have helped increases production 61.9 percent of farmers strongly agree 35.5 Percent, showing that subsidies have significantly contributed to higher agricultural output. Regarding Agricultural, subsidies have made farming operations more efficient. For the statement Agriculture, equipment helps save time in farming operations 53 percent of farmers agreed and 33.2 percent farmers strongly agreed with this statement. For agricultural subsidies have reduced labour cost, 70.1 Percent strongly agreed and 27.4 percent revealing that subsidies have effectively lowered farmer's labour expenses. Lastly, Production reaches the market on time received 56.6 Percent strong agreed and 28.2 percent agreed suggesting that subsidies have improved lowered ability to deliver produce promptly. Overall, the date shows that indicates that Impact of Agricultural Subsidies on Farmers Production and Efficiency, particularly in increasing production, saving time, reducing labour costs and improving market access.

XIII. TESTING OF HYPOTHESIS

For Under Equipment Subsidy Scheme

Null Hypothesis

H_0 1: There is no significant association between the type of equipment subsidy scheme and type of equipment benefit received by the respondents.

Alternative Hypothesis

H_1 2: There is a significant association between the type of equipment subsidy scheme and the type of equipment benefit received by the respondents.

Chi-Square Tests

	Value	df	Asymp.sig. (2-sided)
Pearson Chi-Square	709.891[a]	15	.000
Likelihood Ratio	754.554	15	.000
Linear-by-Linear association	154.575	1	.000
N of Valid Cases	384		

a. Five cells (20.8%) have expected count less than 5. The minimum Expected count is 1.35.

The Chi-Square test result (x^2=709.891, p =0.000) indicates a statistically significant association between the type of equipment subsidy scheme and the type of equipment benefit received by farmers. Hence, the null hypothesis is

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rejected, and alternative hypothesis is accepted. The findings reveal that the nature of equipment benefits varies across different subsidy schemes. For instance, NABARD loans and PM Kisan Tractor Yojana mainly support tractor procurement, whereas RKVY and SMSAM schemes offer other equipment like power tillers, rotovators, and chaff cutters.

One-Sample Statistics
For Increase in farmers Production
Null Hypothesis
H_0 3: Agricultural subsidies have no significant impact on the increase in farmer's production and family income.

Alternative Hypothesis
H_1 3: Agricultural subsidies have a significant positive impact on the increase in farmer's production and family income.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Agriculture Subsidies have helped Increase production of Respondents	384	4.3646	.48194	.02459
Family Income (per annum) Respondent	384	3.62	.635	.032

One- Sample Test

	Test Value=0					
	t	df	Sig.(2-tailed)	Mean Difference	95 % Confidence Interval of the Difference	
					Lower	Upper
Agriculture Subsidies have helped Increase Production of Respondents Family income (per annum) Respondent	177.466	383	.000	4.36458	4.3162	4.4129
	11.854	383	.000	3.622	3.56	3.69

The One-Sample t-test results reveal a statistically significant difference between the sample means and the test value for both variables- agricultural subsidies helping increase production ($t = 177.466$, $p < 0.05$) and family income per annum ($t = 11.854$, $p < 0.05$). Since the p-values are below 0.05, the null hypotheses are rejected, confirming that agricultural subsidies have played a crucial role in enhancing farm productivity and improving the income levels of respondents. The high mean values indicate a strong level of agreement among farmers regarding the positive impact of subsidies on their agricultural outcomes.

XIV. FINDINGS OF THE STUDY BASED ON DATA ANALYSIS

- Out of 384 respondents, the majority of respondents that was 31.5 percent received tractors as equipment beneficiaries, 22.1 percent respondents received rotavators as equipment beneficiaries, and 19.8 percent respondents received M.B. Ploughs as equipment beneficiaries, Smaller proportions benefited from chaff cutters 12 percent, and it was followed by 10 percent benefited equipment is power tillers, and at the last 3.6 percent respondents benefited other agricultural equipment .
- Main Purpose of equipment use in agriculture filed. 35.4 percent of respondents expressed their opinion as use agricultural equipment for harvesting and 35.4 percent of respondents expressed their opinion as use agricultural equipment for land Preparation. Smaller 19 percent proportions use it for cultivation and 9.4 percent, transporting goods with no other reported uses.
- Impact of agricultural equipment subsidies on farmer's production and efficiency of beneficiaries in the study area. Among 384 respondents 61.9 percent of respondents expressed opinion as strongly agree that subsidies helping to increase production, 35.5 percent of respondents expressed opinion as agree and no one respondents expressed as strongly disagree and disagree in subsidies helping to increases production in the research.

- Impact of Agricultural equipment subsidies schemes beneficiaries in the study area. Among 384 respondents 49 percent of respondents expressed opinion as strongly agreeing that subsidies helps about better practices and technologies, 40.4 percent of respondents expressed as Agree and only 8.1 percent of respondents expresses as neutral and no one respondents expressed as strongly disagree and disagree that subsidies helps about better practices and technologies in the research.

XV. SUGGESTIONS

a. Launch multi-platform awareness campaigns through social media, agricultural universities, Krishi Vigyan Kendras (KVKs), radio, television, and local language print media to ensure farmers receive timely and accurate information.
b. Organize regular awareness camps at village, taluk and district levels to demonstrate scheme benefits, eligibility and application procedures.
c. Increase subsidy for small and marginal farmers who face higher financial vulnerability and lower access to credit.
d. Farmers should be encouraged to reduce excessive use of chemical fertilizers and adopt organic fertilizers. This will improve soil health, reduce input costs, and support sustainable farming practices.
e. The government should fix a proper and fair Minimum Support Price for farmers produce. Timely purchase at MSP will protect farmers from low market prices and helps ensure stable income.

XVI. CONCLUSION

The study concludes that agricultural subsidies, particularly those supporting farm equipment and mechanization, have played a significant role in enhancing agricultural production in Bagalkot District of Karnataka. The findings clearly indicate that schemes such as SMAM, RKVY, PM Kisan Tractor Yojana, and NABARD-supported loans have enabled farmers to adopt modern machinery, resulting in higher productivity, reduced labour dependency, time savings in farm operations, and improved efficiency in land preparation and harvesting. The strong agreement among beneficiary farmers regarding the positive outcomes of these subsidies reflects their effectiveness in strengthening farm-level performance and contributing to improved farm incomes and livelihoods.

However, despite the overall positive impact, the study identifies persistent challenges related to limited awareness, procedural complexities, and delays in subsidy disbursement, which restrict the full potential of these schemes—especially for small and marginal farmers. Addressing these constraints through targeted awareness programmes, simplification of application procedures, timely release of benefits, and inclusive policy design is essential. Strengthening institutional support and ensuring equitable access to subsidy schemes will further enhance their effectiveness and contribute to sustainable agricultural development and socio-economic improvement in the region.

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