Effectiveness of Government Spending on Agriculture: A Study on Impact of Subsidy & Access to Agri-Credit on Agricultural GVA in India

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ABSTRACT

This study explores the impact of spending on agricultural productivity in India. It analyzes the link between budget allocations, agrarian credits, and subsidies in evaluating sustainable farming growth. By analyzing secondary data from the past 20 years using quantitative analysis, the research discovers that although government budget allocation and subsidies on agriculture have increased significantly, their direct impact on agricultural development is insignificant. However, access to agricultural credit plays a vital role in agricultural productivity, showing a strong positive correlation with Gross Value Added (GVA). The findings suggest optimizing credit flow rather than increasing budgetary allocations and subsidies. This study contributes to policy discussions on government financial strategies for long-term agricultural development.

Keywords: Budget, Agricultural productivity, Subsidy & Credit.

INTRODUCTION

Agriculture has been the driving force of India's economy, offering and supporting rural livelihoods. Therefore, sustainable growth is inevitable in this sector, as it contributes to overall economic development [5]. A budget is a financial plan that evaluates income and expenses over a period of time. It is typically formulated and adjusted regularly to improve management by governments, businesses, and individuals [9]. Agricultural credit in India plays a vital role in the country's economy. To support the rising credit needs of farmers, the Government of India and RBI have established financial institutions [5]. **"**Agricultural subsidies have been a vital part of government policies, helping to reduce poverty, ensure food security and conserve biodiversity.**"** [9]. Even though government expenditure on agriculture is important for economic development, many questioned the effectiveness and consequences of such programs. According to the OECD (2014), despite the commendable goals achieved by public spending on agriculture, various distortions are connected with the policy. The following questions dominate recent discussions regarding government expenditure: What is the impact of public spending on productivity, growth, income, and individual well-being? Which areas should the government prioritize in terms of fund allocation? Which component of the expenditure contributes more to agricultural growth [8].

Theoretical Framework

According to Keynesian economic theory, "Govt. intervention in agriculture through credit and subsidies can increase economic growth and productivity." Government intervention supports the notion that increased production can result from governmental agricultural investment.

The Resource-Based Theory (RBT) contends that having access to financial resources enables farmers to invest in improved irrigation, seeds, fertilizer, technology, and increasing productivity.

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LITERATURE REVIEW

The study tries to understand the structure of public expenditure, which is very important for the agriculture sector. To achieve this objective, research is conducted on central government spending, disaggregated by expenditure for selected states of South African countries between 2000 and 2014. The findings from the experimental analysis show that agricultural productivity responds differently to the agricultural expenditure types across the countries. Results showed a negative relationship between agricultural growth and expenditures on different study variables [8].

This research aims to demonstrate the extent and caliber of the country's commitment to agricultural growth throughout time, as measured by public spending and budgetary allocation. The findings showed a strong, positive, and substantial association between Nigerian agricultural production and fiscal allocation to the agricultural sector [2].

This study examines the relationship between Nigeria's agricultural budgetary allocation and economic growth using fundamental regression analysis, a co-integration test, and a vector error correction model to ascertain the variable's short-term dynamic behavior. The study showed a long-term favorable correlation between agricultural budget allocation and economic growth [4].

This research examines recent shifts in the allocation and use of the agriculture sector's budget during the last 10 fiscal years. Results showed that agriculture's national gross domestic product share decreased from 35.68 percent to 25.80 percent in the previous ten years. Agriculture significantly contributes to the country's overall GDP, so more funding should be allotted to this sector in the next fiscal year’s [4].

The current study aims to analyze the trajectory and increase of credit flow to agriculture in India after 1991 in recognition of the ongoing slowdown in agricultural growth. According to the study, the structure of credit outlets has changed significantly, and commercial banks are now the agricultural sector's primary source of institutional credit. However, the sustainable growth of Indian agriculture may be hampered by the declining proportion of investment credit in total credit [5].

This paper aims to examine patterns in government spending in emerging nations, examine the factors that led to these changes, and create a framework for analyzing how diverse government spending affects economic growth. Roads, irrigation, education, and agricultural expenditure contributed significantly to its expansion. Research has a substantially more significant influence on productivity than non-research spending, according to a breakdown of overall agricultural expenditures into research and non-research spending [6].

The current study examines several significant facets of agricultural credit, such as growth trends and identifying variables influencing loan flow to specific states. The study tracks the expansion of agricultural loans and discovers that the curve's nature is quadratic, with a significantly lower rate of decrease than the sharp increase in loan growth across all areas.

With the aid of funding allocations for agriculture in five-year plans and the yearly budget, this article primarily focuses on an overview of agricultural subsidies in India. In recent years, India has seen a rise in investment in the agricultural sector and a decline in the percentage of agricultural subsidies [1].

By developing a conditional convergence growth model, this study examines the connection between EU agricultural subsidies and the increase in agricultural labor productivity. We discover that generally speaking, CAP subsidies boost the rise of agricultural labor productivity; however, this overall impact obscures the significant variation in the benefits of other subsidies [7].

This study examines the patterns and development of public expenditure in Indonesia's agriculture sector and how public spending affects agricultural growth. It discusses how public expenditure may help the industry develop quickly and become more productive [2].

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Research Gap

Despite the significance of government budgetary allocation in shaping India's agricultural sector, there is limited recent research on this topic, particularly in the context of the latest economic and policy developments.

Objectives

1. To analyze the relationship between budgetary allocation and agricultural productivity.
2. To know the effect of easy access to agri-credit on agricultural production.
3. To examine the effect of agricultural subsidies and financial support on farm output.

Hypothesis

- H_{01}: Government budgetary allocation has no significant impact on agricultural productivity (GVA).
- H_{02}: Access to agricultural credit does not significantly affect agricultural productivity (GVA).
- H_{03}: Agricultural subsidies do not significantly influence agricultural productivity (GVA).

DATA AND METHODOLOGY

In this study, we employed a quantitative research design to understand the relationship between GB allocation and agricultural GVA in India. The study uses secondary data collected from government reports over the past 20 years. This is done through the purposive sampling technique. The data is processed through MS Excel to test the statistical significance of relationships between government expenditure and agricultural productivity measured through Agricultural GVA.

Research Model - Variables

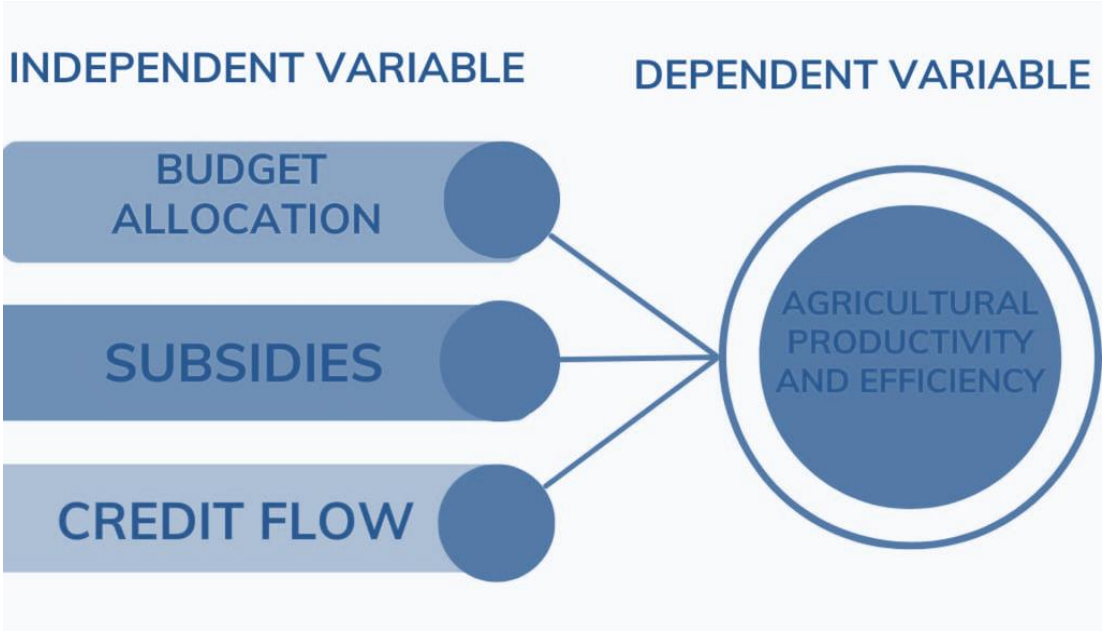

Figure 1: Conceptual Framework of the Study

Conceptual Framework (Fig. 1):

Figure 1 illustrates the conceptual framework that highlights the relationship between selected government financial interventions and agricultural productivity and efficiency. The framework identifies three key independent variables: budget allocation, subsidies, and credit flow.

These variables represent direct government support mechanisms aimed at enhancing the agricultural sector. Budget allocation refers to the financial resources earmarked by the government for agricultural development,

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such as investment in infrastructure, research, and extension services. Subsidies include financial aids like fertilizer, seed, irrigation, and electricity subsidies, which reduce input costs for farmers and improve their economic viability. Credit flow denotes the accessibility and availability of institutional credit provided to farmers through banks and cooperative institutions, which is essential for timely investment in agricultural activities.

All three independent variables are shown to influence the dependent variable – agricultural productivity and efficiency, which encompasses output per unit of input, resource utilization, and overall sectoral performance. The arrows in the diagram indicate a hypothesized direct effect, suggesting that improvements or increases in budget allocation, subsidy provision, and credit flow are expected to positively impact agricultural productivity and efficiency. This framework provides a clear visual representation of how targeted financial policies can drive outcomes in the agricultural sector.

RESULT & DISCUSSION

To test these hypotheses, the regression model is constructed as follows:

$$\mathbf{Y = ß_0 + ß_1x_1 + ß_2x_2 + ß_3x_3 + \varepsilon}$$

Where:

Y = Agricultural Productivity

x_1= Budget Allocation

x_2 = Credit Flow

x_3 = Subsidies

$ß_0$ = Intercept (constant term)

$ß_1$, $ß_2$, $ß_3$ = Regression coefficients

ϵ = Error term

SUMMARY OF REGRESSION RESULT

Multiple R (Correlation Coefficient): 0.9977

R-Square (Explained Variance): 0.9954

Adjusted R-Square: 0.9946

Standard Error: 0.2959

Number of Observations: 20

Anova Analysis

F-Statistic: 1164.46

Significance F: 0 (highly significant)

This indicates that the regression model is highly significant; at least one of the independent variables is significantly related to the dependent variable (Gross Value Added - GVA).

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Coefficients and Statistical Significance

Table 1: Multiple Regression Analysis Results

Predictor Variable	Coefficient	P-value	t-Stat	Significance
Intercept	12.1400	0.0000	81.50	Highly Significant
Budget Allocation	0.0000003292	0.9468	0.068	Not Significant
Credit Flow	0.0000060733	0.0000	18.65	Highly Significant
Major Subsidies	0.0000005108	0.5324	0.638	Not Significant

Result

The p-value for Credit Flow is extremely low (0.0000), indicating a powerful and significant positive impact on GVA. The Budget Allocation has a high p-value (0.9464), suggesting that it is not a statistically significant predictor of GVA. Subsidies have a high p-value (0.5324), indicating no significant impact on GVA.

Correlation Data

Table 2: Correlation Coefficients between Variables

Variable Pair	**Correlation Coefficient**
GVA & BA(Budget Allocation)	0.9464
GVA & Agri-credit Flow	0.9976
GVA & M.S(Major Subsidies)	0.8285

Agri-Credit Flow and GVA have the strongest correlation (0.9976), suggesting a strong direct relationship. BA also has a strong correlation (0.9464), but the regression analysis depicts it as not statistically significant. M.S have the weakest correlation (0.8285) among the three variables.

Significance Gap Between Correlation And Regression

While correlation analysis showed a strong positive relationship between Budget Allocation and Agricultural GVA ($r = 0.9464$), the regression results were statistically insignificant ($p = 0.9468$). This gap suggests that the correlation may be influenced by omitted variables or multicollinearity.

It is possible that Budget Allocation and Subsidies impact GVA only when combined with factors like credit flow, rainfall, crop prices, or institutional support. Future research should control for these variables to better isolate effects.

Implications:

1. Give credit flow rules top priority because they significantly and strongly affect GVA.
2. Examine the efficacy of budget allocation, as it is statistically insignificant even with a strong correlation.
3. Since M.S do not substantially contribute to GVA, reevaluate their effects.
4. Agricultural productivity may be impacted by frequent adjustments to government policies and allocations of funds in ways that are challenging to quantify within the study's parameters.
5. Future studies can consider other components of the union budget.
6. Prioritize Institutional Agri-Credit Expansion through NABARD and RRBs
7. Additionally, advanced models such as hierarchical regression or panel data analysis (where disaggregated data is available) could offer deeper insights into how government spending affects agricultural productivity.

CONCLUSION

According to the analysis, Credit Flow is the main force behind economic growth since it significantly and statistically influences Gross Value Added (GVA). Budget Allocation and Major Subsidies do not exhibit

statistically significant influence despite their strong correlations with GVA, indicating that their direct effects on economic performance may be limited. In light of these conclusions, policymakers should concentrate on improving credit flow as a crucial tool for promoting economic expansion while reevaluating how well budget allocation and subsidies support general economic growth.

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