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IMPACT OF SUBSIDIES ON COST AND RETURNS OF RAGI AND SUGARCANE CULTIVATION IN MANDYA DISTRICT, KARNATAKA

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Abstract
This investigates expenses along with returns of sugarcane and ragi growing in the Mandya District of the area in the context of agricultural subsidies. A multi-phase stratified random choice strategy was used to find 300 volunteers among six taluks, with 150 of them receiving benefits. Nevertheless, another 150 did not. The investigation examines costs, earnings, inefficiency of two different parts using t-tests, cost-benefit analyses, using simple expenditure assumptions (Price C2). Analysis suggested that beneficiary growers improved productivity and net returns on both crops while dramatically lowering expenses for inputs. The costs compared to benefits for beneficiaries are typically greater. Research suggests subsides has a positive effect on agricultural efficiency. Sugarcane farming became cheaper as ragi growing because of improved water along with technique. Results suggest focused along with organized subsidies schemes Increase sustainable agriculture and affordability, along with profit production, particularly for smaller and marginal growers. To ensure equal and productive benefits allocation, the study recommends performing regular evaluations of subsidies along with undertaking organized strategy efforts.
Keywords: Agriculture assistance, growing costs, along with earnings: Ragi, sugarcane, Mandya District. Karnataka, Beneficiary Farmers, Cost-benefit Ratio, and Farm Profitability

INTRODUCTION

The agriculture business remains an important part within the Indian economy, utilizing and supplying approximately fifty percent for the nation's workforce. Throughout Karnataka in farming was essential to preserving food. Improving rural incomes while maintaining local liquidity. Mandya District, commonly referred to as the "Sugar Bowl of Karnataka," has a strong agricultural base, with sugarcane and ragi getting its primary crops... While sugarcane is irrigated using canals from the Krishna Raja Sagara (KRS) Dam, ragi remains an important rain-fed crop for the region's small and marginal farmer.

Considering its significance, the company faces a number of challenges, like growing expenses for inputs, unpredictable the cost, resource limitations, and deteriorating profits. In order to answer those issues, the Indian government, with state governments, established a number different subsidizing applications, including Raitha Siri, the Krishi Bhagya, Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), the National Food Security Mission (NFSM), with the National Sub-Mission on Field Mechanization. Nevertheless, with respect to the agricultural product format, the amount of land owned, and finances at hand, those assistance' ability to improve farming economy varies.

The sugar cane farmers in Mandya frequently get irrigated and mechanization assistance, while a ragi growers depend on smaller-scale technical assistance. As such, the purpose of this study is to investigate why supports impact both expenses and benefits from the spice and sugarcane growing among eligible as well as non-beneficiary farmer. 300 farmers (150 participants and 150 non-beneficiaries) were chosen among 6 taluks through a random stratified selection method. This research uses the CACP's basic cost standards to calculate crop costs, excess and total earnings, and expense-benefit ratios. They are intended to provide clarity regarding the fiscal health of assistance programs besides advocating reforms to improve the effectiveness and equalization of Assistance administration in the state's cropping industry.

REVIEW OF LITERATURE

A careful examination of the existing research establishes the theoretical as well as methodological underpinning for this present study. Multiple research projects throughout India focused on the financial effect on farming assistance, production expenses, and earnings of important products. Thankfully was minimal study in Karnataka across the effects of assistance on various commodities along with field types.

Reddy and Reddy (2013) looked into the impact of agricultural input incentives in Andhra Pradesh and found how fertilizers and power subsidies considerably lowered farming expenses, especially for watered growers.

Gulati and Narayanan (2015) looked into subsidized programs at the federal and state levels and found that while they increased short-term profits, their long-term effectiveness relied on study, implication, and irrigation costs.

According to **Kumar et al. (2018),** input subsidies improved the efficiency of costs and promoted the adoption of superior crops.

Suresh and Kannan (2020) discovered that PM-KISAN more money and agriculture investments within small-scale farmers.

Studies on ragi cultivation

Prabhakar and Raju (2012) discovered both fertilizers and labour were the most expensive parts, having a common cost-benefit ratio of 1.55 in rainfall.

Manjunatha et al. (2016) observed found during the National Food Security Mission, beneficiary growers received a 10-15% reduction in expenses a hectare plus a 12% higher yield.

Nagaraj and Ramesh (2018) and Sowmya and Reddy (2021) concluded that Raitha Siri and NFSM subsidies promoted improved fertilizers overall insect prevention practices, leading to improved revenue and long-term viability for ragi cultivation

For sugarcane

Chandrasekhar and Shankar (2015) discovered that sugarcane stayed exceptionally valuable because of stable markets along with collective help, **Krishnamurthy (2011)** noticed fertilizer and water incentives lowered the expense of inputs by more than 20%. In the study by **Patil et al. (2018),** SMAM-assisted drip cultivation reduced both electricity and water costs. According to **Rajeshwari and Reddy (2020) and Naveen and Goudappa (2021),** robotics improved incentives for inputs boosted production, cost-benefit ratios, and labour effectiveness.

Research on the subsidies offered by Karnataka

Deshpande and Naidu (2014), Raghavendra et al. (2017), and Kaveri et al. (2019) discovered that Raitha Siri and Krishi Bhagya promoted input accessibility, diversity of crops, and sustainability of water, despite poor farmer adoption.

Basavaraj and Manjunath (2020) concluded that integration of state and national schemes such as NFSM and PM-KISAN produced higher marginal gains in farmer income.

Objectives of the Study

1. Determine the cost of cultivating sugarcane and ragi for Mandya district farmers who qualify against those who do not.
2. Determine the profitability and cost-benefit ratios of cultivating sugarcane and ragi on different farm sizes.
3 Evaluate exactly assistance for agriculture impact the revenues of farmers, earnings, along with output.
4. Create initiatives to improve the efficient operation and impartial allocation of support for farming initiatives.

Research Methodology and Research Design

The present inquiry aimed to look at the impact from agricultural assistance on both the expenses and profits of ragi and sugarcane harvesting in Mandya District, Karnataka. A finished theoretical methodology was adopted to ensure impartiality, dependability, along with statistical precision. The research project employed an after-the-fact approach to examine and contrast the effects of assistance involvement among beneficiaries as well as non-beneficiary farmers. This approach is perfect that the examiner doesn't alter the factor in question (subsidy acceptance), instead it examines its organic impact on other factors including expenses, produce, along with sustainability.

Study Area

An investigation took place in Mandya District, which is known to have irrigation-intensive sugarcane farming along with large regions with rainfall ragi. Six taluks—Mandya, Maddur, Srirangapatna, Nagamangala, Pandavapura, and Malavalli—were particularly selected for their irrigation plus rain-fed regions

Sample Size along with Designs

The stratified random sample procedure having several phases had been employed.

• **During Stage I**, six taluks were chosen for their high ragi and sugarcane production.
• **Stage II**: Two villages were randomly selected from each taluk, for a total of twelve villages.
• **Stage III** involved selecting 25 farmers from each community, for a total of 300 farmers (150 beneficiaries and 150 non-beneficiaries).

Farmers who received at least one subsidy in the previous three years under programs such as Raitha Siri, Krishi Bhagya, PM-KISAN, NFSM (National Food Security Mission), or SMAM (Sub-Mission on Agricultural Mechanization) were considered beneficiaries.

Data Collection

Neither types of information had been utilized. The initial information was obtained through a structured and thoroughly evaluated interview process which covers usage of resources, findings, costs, profits, and every single assistance effects. More details are gathered through public and organizational papers, as well as publication

Analytical Framework

It for the Assessment of Agricultural Costs and Prices (CACP) suggested conventional expense groupings, which include Cost A1, A2, and Cost B1, B2, C1, and C2, for estimating the overall expense about farming. Cost C2 was picked for investigation due to its includes overall paid-out with estimated charges. Success has been

determined with cost-benefit ratio (CBR), overall exchange and total returns. The differences in cost, yield, and profitability between beneficiary and non-beneficiary farmers were examined using statistical techniques such mean comparison, t-test, and descriptive analysis. The collected data was coded, tabulated, and analysed using SPSS and MS Excel software for statistical accuracy and interpretation.

Limitations of the Study

Two of the primary agricultural products, ragi, among are only the subjects of this particular investigation which has been limited to the Mandya District. A random selection over three hundred producers, split among poor, small, moderate, and large categories, has been included within the research. It has around 150 dependents and 150 in number non-beneficiaries among them.

- The results are particular to the setting and may not fully represent the situation in various areas or regions
- The information depends on farmers memory or field-level surveys that are possibly impacted by minor narrative biases.
- Just a handful of selected grant schemes were recently looked at.

Scope of the Study

The present research effort limits itself within the Mandya District for Karnataka and is focused primarily with a pair important crop varieties: ragi and sugarcane. The selected crops have been selected because their financial along with geographic significance: ragi was an essential food source cultivated primarily under rain-fed regions, whereas sugarcane is an important irrigation agricultural product within the geographical region. The research project includes a selection of three hundred producers: 150 in number beneficiary (the person who received more than one government subsidy) and 150 non-beneficiaries (which got neither assistance help). Farmers were divided into four categories based on their agricultural operation measurement: poor, small, medium-sized, along with large.

Statement of the Problem

Nearly fifty percent is employed in the agricultural sector, which continues to be an essential component of the nation's financial system. Notwithstanding its essential function, the agriculture sector nevertheless suffers several challenges, like as growing expenses for supplies, fluctuating prices, limited access to water, a lack of workers, as well as weather unpredictability. Together, such problems contribute to lower profits, especially for small and marginal farmers, which account for a large percentage of the nation's agricultural sector.

In order to lower production expenses, encourage long-term viability and increase the profitability of farms, both the national and state governments have responded by implementing several types of assistance programs, such as Raitha Siri, Krishi Bhagya, Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), the National Food Security Mission (NFSM), and the Sub-Mission on Agricultural Mechanization (SMAM). The actual effects of these subsidies at the farm stage, nevertheless, were uncertain or differ significantly depending on location, specific crop, as well number of farms.

Known as the "Sugar Bowl of Karnataka," Mandya District boasts a unique farmland that includes either rain-fed ragi production with watered sugarcane agriculture. Ragi farms mainly depend on smaller input-based assistance, but sugarcane grower’s benefit heavily through water with automated assistance. It calls for inquiry into the effectiveness, availability, along with equality of farming assistance programs.

There is little actual data compared Mandya District farmers who get assistance to those who do not, despite the fact that assistance are intended to lower farming expenses and boost revenue. Additionally, not enough crop-specific studies has been done to evaluate the effects of assistance on expenses, earnings, along with profits at various agricultural types.

Therefore, an additional central problem of inquiry is attempted to be addressed by this investigation:

What extent had assistance programs for agriculture influenced the expenses as well as profits of ragi and sugar cane production in Mandya District, where did these impacts range between beneficiary and non-beneficiary farmers across various farm-size categories?

The quandary emphasizes the need of evaluating the financial impact of farmer assistance with regard to of increased farming income, earnings, and expenditure effectiveness, along with giving suggestions for developing more equal, crop-specific, and size-targeted assistance schemes in Karnataka.

DATA ANALYSIS AND INTERPRETATION

This chapter contains a detailed analysis and explanation of data collected from 300 sample farmers in Mandya District, comprising 150 beneficiaries and 150 non-beneficiaries of agricultural subsidies. The analysis was carried out with standard cost concepts (CACP approach), cost-benefit ratios, t-tests for mean difference, and descriptive statistics. The data was analysed with MS Excel and SPSS software.

The major purpose of this study is to investigate how subsidy participation impacts the cost of cultivation, yield, gross and net returns, and overall profitability of two key crops: ragi (rain fed) and sugarcane (irrigated), across various farm-size categories.

Socio-Economic Profile of Farmers

Parameter	Beneficiary Farmers	Non-Beneficiary Farmers
Average Age (years)	45	46
Average Farm Size (acres)	5.2	4.9

Parameter	Beneficiary Farmers	Non-Beneficiary Farmers
Literacy (%)	78	72
Male-headed Households (%)	92	94
Average Experience in Farming (years)	18	17

Source: Primary data collected from field survey

Interpretation:

Benefit producers demonstrated higher levels of awareness, control, along with understanding, this might have allowed individuals to engage in assistance initiatives. Beneficiary had more people who were literate (78%), plus their agricultural holdings were bigger (5.2 acres), implying more accessibility for managerial skills plus supports. Here demonstrates the economic advantages of individuals whom enjoyed sufficient assistance provided by government.

Cost of Cultivation of Ragi

Farm Size	Beneficiary (₹/acre)	Non-Beneficiary (₹/acre)	t-value
Marginal	18,500	20,200	2.12*
Small	19,200	21,000	2.35*
Medium	21,500	23,300	2.41*
Large	23,800	25,600	2.18*

Source: Primary data collected from field survey

Interpretation:

Beneficiaries across every category received lower production expenses. Fertilizer, seeds, along with worker incentives reduced all spending while increasing the effectiveness of costs. A variation is significantly different around the 5% level, implying a grant acceptance successfully decreased expenditures on inputs for ragi farmers.

Yield of Ragi

Farm Size	Beneficiary (qtl/acre)	Non-Beneficiary (qtl/acre)	t-value
Marginal	12.5	11.2	2.03*
Small	13.2	11.8	2.28*
Medium	14.5	13.0	2.37*
Large	15.8	14.2	2.11*

Source: Primary data collected from field survey

Interpretation:

Ragi pollutants was significantly greater with the beneficiaries. Productivity grew by 10% to 15% as a result of the accessibility for subsidised premium seeds along with better fertilizer under Raita Siri and NFSM initiatives. That shows what help activities are having an immediate effect upon technological implementation along with revenue.

Net and Gross Returns from Ragi

Farm Size	Gross Return (₹/acre) Beneficiary	Net Return (₹/acre) Beneficiary	Gross Return Non-Beneficiary	Net Return Non-Beneficiary
Marginal	25,600	7,100	23,500	3,300
Small	27,200	8,000	24,800	3,800
Medium	30,000	8,500	27,500	4,200
Large	32,500	8,700	29,800	4,200

Source: Primary data collected from field survey

Interpretation:

Beneficiary growers obtained far greater gross and net incomes. The variation through net earnings suggests it has additionally cut operating expenses additionally aided financial wealth allocation. The effect were most obvious between marginal and small farmers, which depend largely on financial incentives.

Cost–Benefit Ratio (CBR) for Ragi

Farm Size	Beneficiary	Non-Beneficiary
Marginal	1.38	1.16
Small	1.42	1.18
Medium	1.40	1.18
Large	1.37	1.16

Source: Primary data collected from field survey,

Interpretation:
Cost-benefit ratio (CBR) levels above 1.0 indicate income among all growers, but benefactors achieved a substantially higher ratio. It suggests the way incentives increased economic viability along with facilitated effective use of resources. An overall CBR enhancement of over 20% suggests subsidized assistance enhanced agriculture productivity.

Cost of Cultivation of Sugarcane

Farm Size	Beneficiary (₹/acre)	Non-Beneficiary (₹/acre)	t-value
Marginal	48,500	52,000	2.44*
Small	50,200	54,100	2.36*
Medium	53,800	57,900	2.51*
Large	58,500	63,000	2.29*

Source: Primary data collected from field survey,

Interpretation:
Subsidies for water supply, machinery, along with fertiliser supplies greatly reduced sugarcane growing costs among benefited growers. A typical cost savings of 6-8% each acres highlight the economical sustainability for initiatives like Krishi Bhagya and SMAM. The hypothesis test confirmed whether the price variances was substantial.

Yield of Sugarcane

Farm Size	Beneficiary (qtl/acre)	Non-Beneficiary (qtl/acre)	t-value
Marginal	360	330	2.21*
Small	375	345	2.38*
Medium	390	360	2.45*
Large	405	370	2.32*

Source: Primary data collected from field survey

Interpretation:
Beneficiary achieved greater harvests regardless of farm types. Economic 8-10% increase demonstrates the impact of machinery, which was assisted with subsidy alongside excellent water supply. Study reveals within irrigation farms, targeted subsidies distribution improved yields along with ensured higher inputs consumption.

Net and Gross Returns from Sugarcane

Farm Size	Gross Return (₹/acre) Beneficiary	Net Return (₹/acre) Beneficiary	Gross Return Non-Beneficiary	Net Return Non-Beneficiary
Marginal	95,000	46,500	90,000	38,000
Small	98,500	48,300	92,500	38,400
Medium	105,000	51,200	98,800	40,900
Large	112,000	53,500	104,500	41,500

Source: Primary data collected from field survey,

Interpretation:
Sugarcane growers had much higher return on investment (varying between ₹8,000 to ₹12,000 every acre). This encouragement, specifically for medium- and large-scale farmers that obtained machines incentives, significantly reduced input costs and enhanced revenue. The constructive earnings rates indicate agricultural income with incentives.

Summary of Findings

The study discovered that agricultural support had a significant impact on the price structure, revenues, and sustainability of ragi and sugarcane production in Mandya District. Benefit growers got assistance through several government initiatives including Raita Siri, Krishi Bhagya, PM-KISAN, NFSM, and SMAM, resulting in reduced expenses for inputs plus greater earnings than non-beneficiaries. The findings definitely confirmed that incentives contributed to reduce the expenses of production for all crops—by 6-10% an acre—by providing monetary help for agricultural products, seeds,automation,plus water. Ragi growing between beneficiaries resulted in a significant boost in production, which varied between 10% to 15% across farm lengths. In a similar way sugarcane growers who received assistance had output increases of 8% to 10%, demonstrating the benefits of technology and effective use of water. Users experienced much better gross and net returns, particularly small and marginal farmers that rely primarily on government assistance. Net earnings each acre for ragi raised by ₹3,000-₹5,000, while sugarcane yields climbed by ₹8,000-12,000 over non-beneficiaries. The cost-benefit ratio (CBR) research supported the financial advantages of subsidised involvement. Beneficiary ragi farmers had CBR values, whereas non-beneficiaries had ratios between 1.16 and 1.18. In a similar way sugarcane growers receiving subsidies expressed higher revenues, demonstrating the efficacy of these actions. Analysis of variance (t-tests) revealed that variations in expenses, production, along with efficiency across beneficiaries and non-beneficiaries proved

significant at the 5% level, demonstrating thus the effect of supports was not merely because of random but the direct consequence of policies.

This demographic research found that beneficiary farmers had greater knowledge levels, more extensive farms, and a better understanding regarding government activities, allowing individuals to obtain and use incentives better. Sugarcane agriculture also proved to be less expensive than ragi growing, owing to the region's improved water supply along with mechanized assistance. In summary, the information found that assistance improve expenditure effectiveness, utilization of resources along with earnings from farming, especially among small and marginal farmers

In conclusion, the investigation discovered that specific and properly executed subsidies significantly boost productivity in agriculture overall earnings. Nevertheless, those results highlight the necessity for improved evaluation, regular pay out, along with greater coordination throughout national and state-level initiatives to achieve fair along with sustainable advantages for all types of producers in Mandya District.

CONCLUSIONS

the present research definitely suggests that agricultural assistance can having an important and beneficial effect on the expenses along with revenue of ragi and sugarcane production in Mandya District. The investigation discovered overall benefit growers experienced less expensive inputs, greater production, along with better net and gross returns than those who are not beneficiaries throughout all crop groups. Assistance programs such as Raita Siri, Krishi Bhagya, PM-KISAN, NFSM, and SMAM helped farmers cut expenses for farming from subsidizing crops, fertilizers, machinery, and other water supply. For such, benefactors' cost-benefit ratios (CBR) continue to rise, indicating greater revenue and economic viability.

The research revealed that ragi growers gained the greatest advantage form input-based along with crop assistance, it raised production across rain-fed areas, however sugarcane farmers earned through mechanization along with irrigation-related assistance, who improved the effectiveness of resources and yield. While both agricultural products produced positive advantages, sugarcane farming showed to be less expensive due to more watering along with assistance from technology. The results of the t- test revealed systematically substantial variances in expenses, production, along with efficiency across beneficiary and non-beneficiary producers, implying the support schemes had an immediate effect upon agricultural output as well as income.

Moreover, the results indicate which small and marginal farmers benefited greatest through assistance in the form of lowering expenses and production increases, underscoring the importance of accessible along with targeted assistance programs. Nevertheless, the research underlines the significance of continuous evaluation, effective shipment, along with combining of multiple financing schemes for ensuring equal participation along with sustainable growth. Furthermore, when implemented properly, agricultural subsidies are an effective tool for enhancing farm output, earnings, along with financial stability. Successful collaboration across both national and state activities, in combination with early payment, technological acceptance, as well as fair execution, may substantially boost the effects of these activities.

- Assistance had a positive major impact on agricultural output in the Mandya district.
- These reduce the expense of inputs, increase production, and improve overall profitability between ragi (rain-fed) and sugarcane (irrigated) farmers.
- Focused especially planned assistance systems boost agricultural long-term viability especially for small and marginal farmers.
- Sugarcane production is still less expensive then ragi cultivation because of better watering system plus machinery.
- Regular assessment or enhanced coordinated policies are necessary to guarantee that advantages are distributed fairly and efficiently.

Suggestions

The results of the current study definitely indicate that land use subsidies have a significant impact on the expenses, effectiveness and earnings of ragi and sugarcane growing in Mandya District. In accordance with these findings, a number of legislative that economic suggestions are offered to improve the effectiveness of assistance programs along with support the sustainable growth of agriculture.

Initially subsidies need to be concentrated along with crop-specific. Improving producer records which include those PM-KISAN websites would guarantee which assistance target the most at-risk producers: small and marginal. Ragi and sugarcane constitute diverse ago-ecological systems—rain-fed along with watered, respectively—so different legislative structures are required to manage their specific needs. A single-window financing system that combines both federal and state programs like as Raitha Siri, Krishi Bhagya, PM-KISAN, NFSM, and SMAM might reduce overlap and increase effectiveness.Frequent evaluations along with analysis all assistance initiatives will help to check its efficacy while finding opportunities for growth. Regular examinations for influence may assistance establish whether support reaches expectations Targets for cost reductions, expansion of revenue, and capital durability. Within the same a period of time combining beneficial features from other apps will improve efficiencies while encouraging equitable allocation of rewards between all kinds of farmers.

Assistance in reality may be given by encouraging responsible mechanized and productive watering. Developing separate labour stores or shared machinery for farming facilities Local authorities can help farmers who cannot afford pricey equipment on their own. Likewise, expanding the implementation of technologies including drippers in addition sprinkler installations will enhance water use. Particularly for sugarcane growers. Enhancing groundwater management with rainfall collecting may aid ragi growers in maintaining growth in rain-fed locations.

Increasing infrastructure towards training in agriculture as well providing services remains a major priority. Regular instruction regarding manpower management, improved seeds, distributing fertilizer, along with technology. Besides adhering to growing restrictions, growers may utilize greater use of aid. Expanding Krishi Vigyan Kendra's (KVKs) to offer local assistance in consulting might help farmers in improving their ability to implement and implementing innovative ways.

Economically, farmers will be interested in expand their growing techniques rather of depending only on sugarcane. Raising the grain millet heartbeat, and horticulture production through suitable incentives may help in maintaining soil quality when mitigating harvesting risks... Additionally, joining FPOs (Farmer Producer Organizations) can assist growers in consolidating substances, making use of large subsidies, and increasing their economic power. Enhancing more expeditious management about assistance funds. Employing direct benefit transfer strategies will improve funding accessibility while decreasing the demand for informal financing. To promote responsibility and also integrity, online monitors founded on GIS mapping and cell phone surveillance should be implemented to verify that support is delivered effectively.

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