

Oroiginal Article

Impact of Pm-Kisan Samman Nidhi and Rythu Bharosa Schemes on Marginal and Small Farmers in Guntur District of Andhra Pradesh

¹Mandadi Venkatesh Reddy

¹Department of Economics, Acharya Nagarjuna University, Guntur District, Andhra Pradesh, India.

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Abstract: Agriculture remains the backbone of India's economy, employing approximately 41% of the workforce despite contributing only 15.5% to GDP. Small and marginal farmers, who make up more than 86% of the Indian farming community, only have access to a limited amount of farmland, are perpetually in debt, encounter increasing cost of inputs and are exposed to economic shocks. The PM-KISAN, introduced in 2019, offers ₹6,000 per annum to landholding farmers; Andhra Pradesh's Rythu Bharosa scheme (renamed as Annadata Sukhibhava) is an addition of another ₹7,500 annually. This paper analyses the implications of such direct income support schemes on marginal and small paddy farmers in Guntur district, Andhra Pradesh. Primary data were collected through structured interviews from 640 farmers (320 marginal and 320 small) across four mandals—Ponnur, Kakumanu, Duggirala, and Tenali—selected based on the highest paddy cultivation area. Twenty marginal and twenty small farmers were randomly selected from four villages in each mandal. Data was analyzed by using descriptive statistics, reliability analysis, paired sample t-test and correlation analysis to determine the impact of the scheme on annual income, dependency on moneylenders, debt level, agricultural production scale at their fields(green revolution kits), food security status and farmer empowerment. The techniques were shown to have a strong positive effect, with 90.0% of farmers reporting increased annual income and 87.5% reporting less debt. Dependence on moneylenders reduced in all (100%) of the respondents. 73.0% of farmers claimed that agricultural productivity had improved, and 88.3% reported that food security had improved. The paired sample t-test showed that the difference between pre-and post-scheme income was highly significant at $p < 0.001$. High positive significant correlations were found between scheme benefits and reduction in financial distress ($r = 0.742$), increase in productivity ($r = 0.685$) and farmer empowerment (%) $r = 0.798$). Internal consistency reliability was high (Cronbach's $\alpha = 0.891$) for the impact assessment scales. The PM-KISAN and Rythu Bharosa schemes successfully increased financial stability, decreased use of moneylenders, increased agricultural investments and food security among marginal/small farmers. However, challenges remain, such as inadequate money following and delayed payment, and a lack of knowledge of the grievance procedure. Propositions include increased financial support, timely distribution of assistance, improvement in monitoring and promotion of awareness.

Keywords: PM-KISAN, Rythu Bharosa, Marginal Farmers, Small Farmers, Direct Benefit Transfer, Agricultural Income, Andhra Pradesh.

I. INTRODUCTION

Since the time of Nebuchadnezzar, it has been relegated to agriculture, India (1889), p. 482. But as economic planning advanced and diversification in industry and service sectors increased, agriculture's contribution to GDP precipitously fell from 53.1% in 1950-51 to 15.5% in 2021-22. This decline is analogous to the natural path of economic development in developed countries, where, in some cases, agriculture contributes 1-2% to GDP only. Despite this smaller economic contribution, agriculture is still the single most important means of livelihood in India, engaging about 41% of the population as of 2020. Indian agriculture is fraught with numerous problems which are likely to induce distress in the lives of more than 125 million farm-dependent families. The hike in input prices, the volatility of market prices, climate risk and limited access to institutional credit are major impediments. Small and marginal farmers, who are more than 86% of the farming population, operate under a gig economy for agriculture with little landholdings – less than 2 hectares on average cultivation size, very meagre resources, a perpetually indebted situation, lower productivity due to speculative prices against uncontrolled cost of input side, and victimhood for every economic shock. The agrarian crisis, which began in the late 1980s, became acute during the mid-1990s, resulting in suicides, particularly by farmers in the low-rainfall areas and poorly irrigated areas, and high rural indebtedness.



Sensing these issues, the Union Government of India introduced Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) on February 24, 2019, as a direct income support scheme to provide stage-wise financial assistance at the rate of ₹6,000 per farmer family per annum to the landholding farmers. Launched for small and marginal farmers (with land holdings of up to 2 hectares) initially, the scheme was extended from April 1, 2019, to cover all farmer families irrespective of landholding. The aid is given in three equal instalments at intervals of four months and directly transferred to the beneficiaries' bank accounts through the Direct Benefit Transfer (DBT) mode. The Andhra Pradesh government launched the Rythu Bharosa scheme in June 2019 as an additional welfare measure to support farmers, wherein eligible farmer families are given ₹7,500 per annum in addition to the three instalments of PM-KISAN. Renamed as the Annadata Sukhibhava scheme in 2024, it was providing an annual assistance of ₹14,000 from the state government along with PM-KISAN to make a total support amount of ₹20,000 per year. These are important policy interventions for farmers to enhance their income, facilitate the purchase of agricultural inputs or commodities and mitigate agrarian distress.

Andhra Pradesh, especially the Guntur district, is one of the largest paddy grown Indian regions and small and marginal farmers are leading paddy growers. The overlap of PM-KISAN and Rythu Bharosa schemes also offers a rare chance to examine the effect of cash transfer modalities like those of direct income supports on the lives, farming methods, and socioeconomic situation of poor farmers.

II. PROBLEM OF THE STUDY

Though the PM-KISAN and Rythu Bharosa schemes have been introduced, there is not much empirical evidence on whether to what extent to which these schemes will be able to respond to the concerns of marginal small farmers. But critical questions have yet to be answered: How much do these schemes really cut people's reliance on moneylenders? Are they important for agricultural output and cropping diversity? How do they contribute to insolvency and food security? Additionally, operational bottlenecks such as the late release of funds and problems with Aadhaar seeding, insufficient financial assistance and low levels of knowledge about grievance redressal the system may reduce scheme effectiveness. Knowledge of these dimensions is important for evaluating whether interventions are resulting in the desired outcomes to improve farmer livelihoods or promote sustainable agriculture.

A) Need For The Study

The paper fills important information voids pertaining to the impact of direct income support schemes on small and marginal farmers, who form the bulk of India's farming population but encounter distinct vulnerabilities. Although broader literature on farmer welfare schemes exists, there is limited research in regard to how these have been utilized by small and marginal farmers – the usage pattern and perceived impact in changing their agricultural practices, socio-economic profile, and empowerment. This study adds to the theoretical knowledge on how direct income support addresses specific needs and offers a micro-level view of fund allocation for agricultural as well as non-agricultural expenditures. Results provide evidence-based policy adjustments to ensure schemes reach and benefit those they are designed to help.

B) Review Of Literature And Research Gap

Kumar and Babu (2018) studied farmers' awareness of the PM-KISAN scheme in the Guntur district to find 30 per cent of farmers were aware within three months after its launch. Sharma (2019) assessed the macroeconomic impacts of the scheme of SMP multiplier analysis and found a significant positive impact on farmers' income and macroeconomic indicators. Varshney et al. (2020) did not find any selection bias in beneficiary targeting in Uttar Pradesh and observed that modern agricultural technology adoption through Krishi Vigyan Kendras was positively influenced. Reddy et al. (2021) in Ri-Bhoi district of Meghalaya, found that the net returns of beneficiaries was 8.71% higher than those of non-beneficiaries, which depicted a decrease in financial distress. Amitha et al. (2021), examining the impact of Telangana's Rythu Bandhu Scheme, observed the increased purchasing power for inputs, continuation in farming, decreasing rural debt, increasing productivity and their income from being on the farm. In another study, Bhadwal and Kumar (2022) analyzed the utilization of PM-KISAN funds in Kangra district which found that farmers invested in agriculture during the peak season, while they utilized the funds for consumption during off-seasons with notable difference among marginal and small farmers. Jagadeshwaran et al. (2022) reported that the PM-KISAN beneficiaries in Tamil Nadu incurred lower costs of cultivation and had higher net returns in paddy, with a mean technical efficiency of 84 %.

Harikumar and Dhandapani (2024) studied PM-KISAN's effect on liquidity constraints in the Tamil Nadu Cauvery Delta Zone. Not only did the scheme enhance livelihood and self-reliance, but it also reported some of the challenges, such as trouble with the registration process, irregular payment and lack of funds. Though these studies have contributed immensely to our understanding of the combined impact of PM-KISAN along with Rythu Bharosa scheme, substantial lacunae continue in the comprehensive assessment impact analysis of both these schemes together across marginal and small farmers, especially, fund utilization patterns, implementation constraints, and perceived impacts at the socio-economic level in paddy cultivating regions like Andhra Pradesh.

C) Objectives

1. To examine the socio-economic profile of sample marginal and small paddy farmers in Guntur district.
2. To assess the impact of PM-KISAN and Rythu Bharosa schemes on farmers' annual income, dependency on moneylenders, and indebtedness levels.
3. To evaluate the schemes' influence on agricultural productivity, food security, and farmer empowerment.
4. To analyze the relationship between scheme benefits and various outcome indicators among beneficiaries.

D) Hypothesis

- **H1:** There is a significant difference in the income levels of farmers before and after receiving PM-KISAN and Rythu Bharosa scheme benefits.
- **H2:** There is a significant positive correlation between scheme participation and reduced dependency on informal credit sources.

III. METHODOLOGY

A cross-sectional research design was used, and primary data were collected through a well-planned interview schedule from 640 farmers in the Guntur district of Andhra Pradesh state. Guntur district was intentionally selected familiar for paddy sowing. Based on the maximum geographical area under paddy cultivation, four mandals (Ponnur, Kakumanu, Duggirala and Tenali) were selected. From each mandal 4 villages were taken by simple random sampling. In each village, 20 small and 20 marginal PM-KISAN beneficiary farmers were selected, resulting in a sample of 160 farmers per mandal and 640 farmers across all four mandals. Small farmers were categorized as those owning land between 1-2 hectares, and marginal farmers with less than 1 hectare of land. Data was collected in 2023-24 after the idea had been in the scheme for longer than four years into the scheme.

A) Tools For Data Analysis

The statistical analysis was performed using SPSS 26.0 software. Descriptive statistics in terms of frequencies, percentages, means and standard deviations were used to describe sample demography and response trends. 61686076 One way to evaluate the scheme's reliability is to quantify its internal consistency under a multi-item scale. Reliability analysis: The internal consistency of the scales, which are involved in measuring scheme impact, has been measured using Cronbach's alpha coefficient. Farmers' income before and after scheme implementation was compared using a paired sample t-test in order to test hypothesis H1. Pearson correlations were estimated to evaluate associations of scheme benefits and outcomes: moneylender reliance, indebtedness, agricultural productivity, food security and farmer empowerment (testing hypothesis H2). Statistical significance was considered 5% ($\alpha=0.05$) for all tests. Data presentation and interpretation were enhanced by tables and graphics.

IV. RESULTS:**Table 1: Socio-Economic Profile of Sample Farmers**

| Characteristic | Category | Frequency | Percentage |
|-----------------|---------------------|-----------|------------|
| Age | Below 30 years | 62 | 9.7 |
| | 30-40 years | 241 | 37.7 |
| | 40-50 years | 226 | 35.3 |
| Gender | Above 50 years | 111 | 17.3 |
| | Male | 571 | 89.2 |
| Social Category | Female | 69 | 10.8 |
| | Forward Category | 336 | 52.5 |
| | Backward Classes | 264 | 41.3 |
| Literacy Level | SC/ST | 40 | 6.3 |
| | Illiterate | 201 | 31.4 |
| | Primary | 209 | 32.7 |
| | Upper Primary | 104 | 16.3 |
| Family Type | SSC and above | 126 | 19.7 |
| | Nuclear | 588 | 91.9 |
| | Joint | 52 | 8.1 |
| Annual Income | < ₹1,50,000 | 160 | 25.0 |
| | ₹1,50,000-₹2,50,000 | 358 | 55.9 |
| | > ₹2,50,000 | 122 | 19.1 |
| Indebtedness | Indebted | 540 | 84.4 |
| | Not Indebted | 100 | 15.6 |

Source: Primary data

Table Description: Demographic and socio-economic characteristics of 640 sample farmers across four mandals in Guntur district.

Observation: The majority of farmers (73.0%) fall within the 30-50 years age group, indicating an active working-age population. Males constitute 89.2% of the sample, reflecting traditional gender patterns in agricultural landholding. Over half (52.5%) belong to the Forward Category, followed by the Backwards Classes (41.3%). Literacy remains concerning with 31.4% illiterate and 32.7% having only primary education. Nuclear families dominate (91.9%), while 55.9% report annual income between ₹1,50,000-₹2,50,000. Alarming, 84.4% of farmers are indebted, highlighting financial vulnerability.

Interpretation: Age structure: According to the age distribution, there are very few youth involved in farming, thus representing an ageing population of farming. Women are going to be the face of this agrarian revolution, despite having 43% landholdings in India: Gender deprivation in landholding is symptomatic of systemic inequity, when economically independent women are clearly beneficiaries of the scheme. Distribution of social categories reflects community heterogeneity. Poor literacy could compromise farmers' access to scheme information and dealings with bureaucracy. Nuclear family structure has already become the dominant one, and moderate family size is now ubiquitous. The concentration of income in the middle bracket is also not indicative of either extreme poverty or wealth, and the prevalence of indebtedness speaks to a recurring financial stress that requires intervention through income support programmes.

Findings: A sample farmer usually is a middle-aged male belonging to various social categories with moderate literacy and a nuclear family. Income clumping in the range of ₹1,50,000-₹2,50,000 per annum implies limited agricultural profitability. High incidence of indebtedness (84.4%) creates a baseline financial stress Governance, in-Service and Planning -level) that PM-KISAN +Rythu Bharosa schemes seek to cover. These features correspond with characteristics of small and marginal farmer communities in rice-growing areas, confirming the representativeness of the sample for estimating scheme impacts.

Discussion: Structural vulnerabilities on the basis of socio-economic profile are reflected, which in turn, existing income support programmes try to address. Age structure and the need for sustaining youth in agriculture. Gender inequality calls for gender-targeted interventions among women farmers. Lower literacy suggests a need for simplified scheme processes and more effective awareness. High indebtedness forms an important benchmark to assess schemes in mitigating financial dependency and enhancing economic security among such vulnerable farming households.

Table 2: Reliability Analysis of Impact Assessment Scales

| Scale Dimension | Number of Items | Cronbach's Alpha |
|----------------------------------|-----------------|------------------|
| Income and Financial Impact | 4 | 0.867 |
| Agricultural Productivity Impact | 3 | 0.823 |
| Food Security and Consumption | 3 | 0.796 |
| Farmer Empowerment | 4 | 0.881 |
| Overall Impact Assessment | 14 | 0.891 |

Source: Primary data

Table Description: Internal consistency reliability coefficients for multi-item scales measuring different dimensions of scheme impact.

Observation: All scale dimensions demonstrate high internal consistency with Cronbach's alpha coefficients exceeding 0.79. The Farmer Empowerment scale shows the highest reliability ($\alpha=0.881$), followed by Income and Financial Impact ($\alpha=0.867$). Agricultural Productivity Impact scale ($\alpha=0.823$) and Food Security and Consumption scale ($\alpha=0.796$) also exceed acceptable reliability thresholds. Overall Impact Assessment scale combining all dimensions achieves excellent reliability ($\alpha=0.891$).

Interpretation: Cronbach's alpha coefficients higher than the predetermined level of 0.70 support good internal consistency of items that represent each construct, thus establishing measurement instrument quality. High reliability of the Farmer Empowerment dimension indicates that several items adequately measure this complex-contextualized construct reflecting self-sufficiency, decision-making freedom and lower dependence. The strong reliability of Income and Financial Impact scale also guarantees that even if income increase, moneylender dependency reduction, and indebtedness relief belong to different factors, they are consistently measured by the factor of financial improvement. An overall scale reliability of 0.891 confirms that the full instrument measures scheme impact consistently along several dimensions.

Findings: The measuring device presents good psychometric properties, and the different scales show reliability levels ranging from 0.796 to 0.891, all above minimum acceptable levels. This is one test of internal consistency testing for scales used to measure scheme impacts. Excellent reliability of the overall CFA impact assessment scale ($\alpha=0.891$) supports the fact that the 14-item CFA instrument measures, in a consistent and dependable way, indeed, the comprehensive effect of PM-KISAN/Rythu Bharosa schemes on the lives of farmers.

Discussion: The high reliability coefficients indicate methodological rigour and guarantee that the observed effects truly correspond to scheme impacts but not measurement error. This increases confidence in further analyses of scheme effectiveness. Validity Farmers' perceptions emerged as valid and reliable indicators of actual scheme impacts along financial, productivity, food security and empowerment dimensions. This type of psychometric validation is important for policy-relevant research that informs scheme refinements.

Table 3: Paired Sample T-Test for Pre-Post Scheme Income Comparison

| Variable | Mean (₹) | Std. Deviation | t-value | df | Sig. (2-tailed) |
|---------------------------|----------|----------------|---------|-----|-----------------|
| Pre-Scheme Annual Income | 1,68,750 | 45,280 | -36.847 | 639 | <0.001 |
| Post-Scheme Annual Income | 1,95,640 | 48,920 | | | |
| Mean Difference | -26,890 | 18,450 | | | |

Source: Primary data

Table Description: Comparison of farmers' annual income levels before and after receiving PM-KISAN and Rythu Bharosa scheme benefits using paired sample t-test.

Observation: Pre-scheme mean annual income stood at ₹1,68,750 (SD=45,280), while post-scheme income increased to ₹1,95,640 (SD=48,920), reflecting a mean increase of ₹26,890. The paired sample t-test yields a highly significant t-value of -36.847 (df=639, $p < 0.001$), indicating a statistically significant income difference. The negative mean difference confirms an income increase post-scheme implementation. The standard deviation increased from 45,280 to 48,920, suggesting marginally greater income variability after scheme implementation.

Interpretation: The significant t-test result ($p < 0.001$) gives compelling evidence to reject unique null hypothesis of no difference and accept H1 that schemes significantly increased farmers' annual income. The ₹26,890 average increase is about a 15.9% boost in income, mostly thanks to the combined annual ₹13,500-under-this-scheme overlay. Apart from the direct transfer, the difference indicates multiplier effects through scheme funds, which allowed for productive investments in agriculture, bringing additional returns. Larger standard deviation may be an indication of differing utilisation efficiency among farmers; some were taking advantage of the scheme to the maximum extent, under the scheme and while others were constrained with some binding effects.

Results: PM-KISAN and Rythu Bharosa schemes had a substantial positive effect on farmers' annual income of Rs 26,890 (15.9 % increase), the mean gain after intervention. Strong evidence of positive effectiveness (in increasing farmer income) can be established if the statistical significance is at the $p < 0.001$ level. This goes beyond simply direct transfer amount, it indicates positive spillover returns through better investment in agriculture and lower interest payments to moneylenders. This is a vindication of the basic objective of schemes to supplement income for marginal and small farmers.

Discussion: The substantial income result illustrates the potential for schemes to function as direct income supports for highly vulnerable farmer populations. The additional increase over the transfer size implies catalytic effects where guaranteed income allowed farmers to decrease costly borrowing from informal sources, boost investment in productivity-enhancing inputs and practices. This is in line with the objectives to break poverty and debt traps. But an increase in income variability needs to be watched out for fair distribution of benefits, as some factors are limiting the extent to which farmers can utilise scheme benefits.

Table 4: Farmers' Perception of Scheme Impact on Key Outcome Indicators

| Impact Indicator | Strongly Agree (%) | Agree (%) | Neutral (%) | Combined Positive (%) |
|------------------------------------|--------------------|-----------|-------------|-----------------------|
| Increased Annual Income | 65.3 | 24.7 | 10.0 | 90.0 |
| Reduced Dependency on Moneylenders | 34.4 | 65.6 | - | 100.0 |
| Reduced Indebtedness | 51.2 | 36.3 | 12.5 | 87.5 |
| Improved Agricultural Productivity | 38.9 | 34.1 | 17.0 | 73.0 |
| Enhanced Food Security | 21.3 | 67.0 | 10.1 | 88.3 |
| Greater Empowerment | 54.8 | 31.1 | 9.2 | 85.9 |
| Encouraged Farming Continuity | 87.5 | 12.5 | - | 100.0 |
| Reduced Wage Employment Dependency | 61.7 | 37.3 | 0.9 | 99.0 |

Source: Primary data

Table Description: Percentage distribution of farmers' agreement levels regarding PM-KISAN and Rythu Bharosa schemes' impact on multiple outcome dimensions.

Observation: Under Loansharing dependency, total consensus (100%) was found for decreased dependence on moneylenders and increased perpetuation of farming. Decreased reliance on wage employment proves to be almost universally agreed upon

(99.0%). An annual income being higher gets 90.0% positive response, whereas a reduced debt of 87.5 % is agreed upon! Similarly very strong positive perceptions exist in terms of increased food security (88.3%) and empowerment (85.9%). Higher agricultural productivity displays moderate yet significant consent (73.0%). Neutral opinions are still low on all measures, 0 to 17.0%.

Interpretation: Findings of general consensus for reduced dependence on moneylenders affirm the vital role of schemes in weaning farmers away from extortionate sources of informal credit. That is impact that truly transforms financial inclusion. Support for on-farm continuity seems to indicate the success of schemes in preventing pushout of farming, despite difficult times, and is based upon a sense that income serves mnemonic as well as cash functions. Strong consensus for lower indebtedness (87.5%) suggests the schemes do work at a fundamental level to reduce the burden of debt. But 12.5% of neutral responses implies that some farmers still face debt stress even with scheme benefits; perhaps in legacy debts which are too large for the schemes to cope with.

Results: PM-KISAN and Rythu Bharosa works have yielded a wide spectrum of positive effects in different aspects of farmer welfare. The schemes were universally successful in decreasing reliance on moneylenders (100% agreement) and promoting the continuity of farming (100% agreement), which are important milestones in financial inclusion and agricultural sustainability. Clear majorities admit income gains (90.0%), debt reduction (87.5%), improved food security (88.3%) and empowerment (85.9%). Lastly, yet still strong evidence of agreement is found for improvement in agricultural productivity (73.0%), indicating potential need for other complementary interventions to incomexxvii support.

Discussion: The perception data support quantitative income analysis, demonstrating the multifaceted effect of schemes on farmers' well-being. Universal decline of dependency on the moneylender is arguably the scheme's greatest success, undercutting vicious debt cycles sustaining poverty. This financial freedom allows farmers to keep more of their agricultural revenue rather than paying for high-interest loans. Facilitating the continuance of farming responds to a fundamental issue relating to the diminishing number of farmers. The lower impact score of agricultural productivity, however, indicates that income support is not an adequate response to productivity constraints involving technical knowledge and improvements in infrastructure and market access.

Table 5: Correlation Analysis Between Scheme Benefits and Outcome Indicators

| Variable Pair | Pearson Correlation (r) | Sig. (2-tailed) | Relationship |
|--|-------------------------|-----------------|-------------------|
| Scheme Benefits × Reduced Financial Distress | 0.742 | <0.001 | Strong Positive |
| Scheme Benefits × Improved Productivity | 0.685 | <0.001 | Moderate Positive |
| Scheme Benefits × Enhanced Food Security | 0.723 | <0.001 | Strong Positive |
| Scheme Benefits × Farmer Empowerment | 0.798 | <0.001 | Strong Positive |
| Reduced Moneylender Dependency × Income Increase | 0.681 | <0.001 | Moderate Positive |
| Agricultural Productivity × Food Security | 0.712 | <0.001 | Strong Positive |

Source: Primary data

Table Description: Pearson correlation coefficients examining relationships between scheme benefits and various outcome indicators among sample farmers.

Observation: All correlations demonstrate statistically significant positive relationships ($p < 0.001$). Scheme benefits show the strongest correlation with farmer empowerment ($r = 0.798$), followed by reduced financial distress ($r = 0.742$) and enhanced food security ($r = 0.723$). Improved productivity shows a moderate positive correlation ($r = 0.685$). Reduced moneylender dependency correlates moderately with income increase ($r = 0.681$). Agricultural productivity strongly correlates with food security ($r = 0.712$).

Interpretation The highest association of farmer empowerment with scheme benefits ($r = 0.798$) indicates that the impact of schemes is not just financial but psychological and social, as it empowers farmers to take their own decisions regarding farming activities, helping them get better control over them. A high relationship with decreased financial distress ($r = 0.742$) supports the idea that schemes reduce financial strain successfully in removing economic hardship. A strong association ($r = 0.723$) between higher food security and income support also suggests that increasing access to money means better

household nutrition. The low to moderate correlation ($r=0.685$) shows that while schemes contribute positively to productivity through input acquisition, other factors are also influential in determining the outcome of output decisions.

Results: The results of the correlation analysis show a positive association between Scheme participation and several well-being indicators, supporting H2. Farmer worth is found to be the most impactful area of schemes ($r=0.798$), followed by reduction in financial gripes ($r=0.742$) and increase in food security ($r=0.723$). These robust correlation facts endorse the effectiveness of schemes toward multidimensional welfare enhancements. Given the moderate association of reducing moneylender dependency with increasing income ($r=0.681$) and productivity with scheme benefits ($r=0.685$), it is likely that these relationships are mediated by other factors which warrant further examination.

Discussion: Sinterograms demonstrate that schemes operate through more than just direct income transfer. The most highly associated attribute of empowerment is the belief that having a guaranteed income provides them with psychological safety, which allows for risk-taking and experimentation with new agricultural practices. The strong positive correlations of food security confirm that income transfer would directly enhance household consumption levels and alleviate the chronic undernutrition among farm families. The relatively low correlation for productivity reflects the fact that income support alone is insufficient to lead to productivity improvements in agriculture and requires complementary interventions around agricultural extension, technology access, and market linkages. The high correlation ($r = 0.712$) noted between agricultural productivity and food security strengthens agriculture's critical role in household nutrition for farming households.

V. DISCUSSION

This in-depth evaluation of the PM-KISAN and Rythu Bharosa on marginal and small farmers' well-being in Guntur district demonstrates overwhelmingly satisfactory gains along various dimensions of farmer welfare. The primary objective of income supplementation has been achieved by the schemes there is a statistically significant increase in incomes annually by ₹26,890, which is 15.9% better than the pre-scheme levels. This increase is over and above the payments made through direct transfers, implying beneficial spillover effects due to lower interest payments to local moneylenders and enhanced investment in agriculture.

A virtually universal decrease in reliance on moneylenders is, perhaps, the most pervasive of all the schemes' transformations. By offering guaranteed income at key points in the agricultural cycle, schemes have liberated farmers from reliance on informal credit markets with extortionate interest charges. This economic freedom frees farmers to keep more of their farming proceeds, ending deadly debt cycles that perpetuated generational poverty. The high positive relationship between scheme benefits and alleviation of financial distress ($r=0.742$) confirms numerically that farmers' financial welfare has been transforming qualitatively.

The positive effects of increased agricultural productivity are modest relative to financial and empowerment dimensions. This implies that while income support facilitates input purchases, improving productivity would require associated interventions addressing technical know-how gaps, infrastructure deficits and market access conditions. The moderate ($r=0.685$) association of the scheme benefits with productivity reflects that other important determinants, such as availability of irrigation, extension services and access to quality inputs plus market linkages, have an overriding influence on the realisation of productivity beyond financial ability.

Improved food security is revealed as another substantial scheme impact, with 88.3% of farmers indicating increased levels. The positive association between scheme benefit and food security ($r=0.723$) shows how manual income support leads to improved household nutrition per se. This confirms predictions that structural limits to income are the chief obstacles to nutrition security for farm households. Likewise, a strong association between agricultural productivity and food security ($r=0.712$) supports a baseline role of agriculture in a family's nutrition.

The closest relationship to scheme benefits was observed for farmer empowerment ($r=0.798$), which implies that psychological and social consequences are deeper than mere financial support. Stable income gives farmers psychological security and the ability to make choices themselves, not to be exploited, which helps farmers regain control of part of their agricultural activities. This intangible dimension of empowerment may end up being the most lasting legacy of schemes, shaping the dignity and agency of historically long-marginalized farming communities.

VI. SUMMARY

The present study analysed the impact of PM-KISAN and Rythu Bharosa schemes on 640 marginal and small farmers in four mandals of Guntur district, Andhra Pradesh. These schemes contribute a combined annual income support of ₹13,500 to farmers who are eligible by adopting the respective direct benefit transfer (DBT) systems. The study sample included a high percentage of males (89.2%) and middle-aged farmers; it was selected from different social classes, 84.4% were debtors at baseline. The Cronbach's coefficient alpha of the instrument for overall impact assessment was 0.891 and was subjected to reliability analysis on a one-factor (total) scale. Results The paired sample t-test showed that monthly earnings per respondent

increased significantly by Rs 26,890 (15.9% improvement) since the implementation of the scheme ($t=-36.847$, $p<0.001$), thus confirming Hypothesis 1. Farmers' perceptions -There was complete agreement (100%) among farmers on reduced moneylender dependence and encouragement of farming activity continuation. Large majorities reported income increase (90.0%), debt reduction (87.5%), food security improvement (88.3%) and empowerment (85.9%). A high degree but relatively lower agreement was observed for the first AG outcome of agricultural productivity improvement (73.0%). Correlation analysis found that there were significant positive correlations between scheme benefits and several indicators of welfare, supporting Hypothesis 2. The strongest correlations were observed between scheme benefits and farmers' empowerment ($r=0.798$), decreased financial distress of farmers ($r=0.742$) and increased food security ($r=0.723$). There were appreciable positive correlations between benefit from the scheme and increased productivity ($r=0.685$), and moneylender dependency with an increase in income ($r=0.681$). All of the correlations significantly differed ($p<0.001$) from zero.

VII. CONCLUSION

PM-KISAN and Rythu Bharosa are found to beneficially influence the welfare of the marginal and small farmers of Guntur district. The programmes were successful in contributing to enhancing income as well; the increases in earnings that they generated above the amounts of direct transfers were statistically significant (i.e. there was a positive spillover of direct transfers). In other words, the across-the-board lowering of reliance on moneylenders is evidence of transformative financial inclusion success: it frees people from debt slavery. Resulting significant enhancements related to food security, farmer empowerment, and relief from financial distress corroborate schemes' multidimensional welfare impacts. But the issues are still many- lack of required financial support in relation to farmers' needs, a delay in payment disbursing hampering farm operation timings and poor knowledge about grievance redressal. Despite a rise in agricultural productivity, it is still limited by factors other than financial resources, such as a lack of technical know-how and poor infrastructure. These results indicate that though direct income support schemes are able to address the issues of financial constraints, holistic agricultural development is more likely to occur when such schemes are combined with extension supports, infrastructural development and market linkages in order for production productivity and sustainability objectives to be achieved.

A) Suggestions And Policy Implications

A number of lessons, gleaned from the research results, come out for improving scheme implementation and effectiveness. For one, the level of financial support needs to be raised high enough for it to cover all increases in costs and inflation-related income losses so that it truly supplements income significantly. Second, payment disbursement times are critically important to get this right: farmers must access funds at the various agricultural time horizons when they need to buy inputs. Third, there is a need to intensify the awareness generation for grievance redressal mechanisms aimed at empowering farmers to handle implementation issues. Fourth, schemes must be linked to meaningful agricultural extensions that provide technical support as well as financial aid in order to maximize productivity impacts. Again, eligibility criteria should be reexamined to make sure non-cultivating landowners are not covered while genuine cultivators get the benefits. VI. Ease of Aadhaar linkage and Bank accounts Open in a simplified manner to ensure administrative convenience. Finally, strong monitoring systems must be put in place to monitor the use of funds, help identify delivery bottlenecks and make sure the benefits reach those for whom they are meant soon enough. Such interventions would improve the efficiency of schemes for promoting sustainable agricultural development and for improving the lives of marginal and small farmers.

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