
Perceived Effectiveness of MGNREGA Plantation Activities: Evidence from Patum Gram Panchayat, Upper Subansiri District, Arunachal Pradesh**Binjay Nirin¹ & Dr. Tagio Kodak²****DOI: <http://doi.org/10.5281/zenodo.23273135>****Review: 30/08/2026****Acceptance: 04/09/2026****Publication: 10/10/2026**

Abstract: *The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) combines employment provision with the creation of productive and natural-resource-based assets. Plantation activities are particularly relevant in rural areas where household livelihoods depend on agriculture and natural resources. This study examines beneficiaries' perceptions of the effectiveness of MGNREGA-supported plantation activities in Patum Gram Panchayat of Upper Subansiri District, Arunachal Pradesh. Primary data were collected from 72 beneficiaries selected purposively from an identified population of 120 beneficiaries associated with plantation activities. The study examines four analytical dimensions of perceived effectiveness: economic benefits, plant survival and maintenance, environmental benefits and community participation. Data were analysed using percentages, mean scores and standard deviations. The findings indicate a moderately positive perception of improvement in household income while the perceived contribution of plantation income to long-term livelihood security is considerably weaker. The findings indicate a moderately positive perception of improvement in household income while the perceived contribution of plantation income to long-term livelihood security is considerably weaker. The study contributes localized evidence from a remote tribal area of Arunachal Pradesh and highlights the importance of assessing plantation interventions beyond immediate employment outcomes.*

Keywords: MGNREGA, Plantation activities, rural livelihoods, Environmental benefits, Community Participation, Arunachal Pradesh

1. Introduction

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is a rights-based rural employment programme that combines wage employment with the creation of durable assets and the strengthening of rural livelihoods. Its significance extends beyond short-term employment because the nature and quality of assets created through the programme can influence household livelihoods, agricultural productivity and local natural-resource management. The employment guarantee has also become an important component of India's broader social-security architecture (Drèze & Khera, 2017). Among the categories of works undertaken through MGNREGA are activities related to land development, horticulture, plantation and natural-resource management. Such interventions have the potential to generate immediate employment while also creating assets whose benefits may continue beyond the period of wage employment.

The MGNREGA guidelines recognise horticultural and plantation-related activities as part of livelihood-oriented and natural-resource-management interventions and emphasise the importance of technical consultation and locally appropriate planning (Government of India, 2024). The significance of such activities is particularly relevant in rural and geographically difficult regions where agriculture, natural resources and wage employment constitute important components of household livelihoods. Upper Subansiri District of Arunachal Pradesh

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presents such a setting. The predominantly rural character of the area and the dependence of households on agriculture and natural resources provide a relevant context for examining whether plantation activities contribute only to immediate employment or also to broader livelihood and environmental outcomes.

Therefore, the present study examines the perceived effectiveness of MGNREGA plantation activities in Patum Gram Panchayat of Upper Subansiri District. Rather than treating effectiveness as a single outcome, the study considers four interrelated dimensions: economic benefits, plant survival and maintenance, environmental benefits and community participation. The study is deliberately limited to beneficiary perceptions and does not claim to provide independently measured estimates of plantation survival, household income effects or environmental change.

2. Literature Review

The literature on MGNREGA has developed around several major themes, including employment security, rural livelihoods, asset creation, natural resource management and programme implementation. **Ambasta, Shankar and Shah (2008)** emphasized the broader developmental potential of NREGA particularly the need for effective implementation and the creation of productive rural assets. This perspective is relevant to plantation activities where the benefits of the assets created may extend beyond immediate wage employment. **Esteves et al. (2013)** examined the environmental and socio-economic benefits of MGNREGA works and found that such interventions could contribute to reducing agricultural and livelihood vulnerability. Similarly, **Anantha et al. (2021)** examined MGNREGA-supported natural resource management works, including water harvesting, pasture and orchard development and reported improvements in water resources, agricultural productivity and ecosystem services. Their findings also underline the importance of ecological conditions and appropriate planning for achieving sustainable outcomes. **Mishra (2020)**, in a study of coffee plantation in tribal areas of Andhra Pradesh, examined MGNREGS–horticulture convergence and showed how plantation and maintenance activities could extend programme benefits beyond immediate wage employment to include financial, income and non-monetary benefits.

The reviewed literature gives comparatively less attention to beneficiaries' perceptions of the effectiveness of plantation activities as a multidimensional intervention. In particular, evidence remains limited on how beneficiaries assess the economic benefits, survival and maintenance of plantations, environmental outcomes and participation at the Gram Panchayat level in remote tribal areas. Findings from other regions may also not fully reflect the ecological and socio-economic conditions of Arunachal Pradesh. Therefore, the present study examines plantation activities in Patum Gram Panchayat, Upper Subansiri district, from the beneficiaries' perspective. It focuses on four analytical dimensions of perceived effectiveness: - economic effectiveness, survival and maintenance, environmental benefits, and community participation.

3. Objectives of the Study

1. To examine the perceived economic effectiveness of plantation activities under MGNREGA.
2. To assess beneficiaries' perceptions of plant survival and maintenance practices.
3. To examine perceived environmental benefits of plantation activities.
4. To analyze community participation in MGNREGA plantation activities.

4. Research Methodology

The study adopted a descriptive-analytical research design. The descriptive component was used to document the response patterns of beneficiaries while the analytical component was used to interpret perceptions

of plantation effectiveness across four dimensions. The study does not claim to establish the objectively measured survival rate of plantations or the causal environmental impact of plantation activities. Instead, it examines beneficiary perceptions of these outcomes.

4.1 Study Area: The study was conducted in Patum Gram Panchayat of Upper Subansiri District, Arunachal Pradesh. The area is predominantly rural and the livelihood conditions of households are closely connected with agriculture, natural resources and wage employment. These characteristics make plantation activities relevant to the broader question of livelihood diversification and rural asset creation. The selection of Patum Gram Panchayat also provides a localized setting in which the relationship between MGNREGA employment, plantation assets and community participation can be examined at the grassroots level.

4.2 Population and Sampling: The study covered 120 beneficiaries associated with the plantation activities in the selected Gram Panchayat. From this population, 72 beneficiaries were selected purposively, representing 60 percent of the identified population. Purposive sampling was adopted because the study specifically required respondents who had direct experience of the plantation activities under investigation. The sample therefore should not be interpreted as a statistically representative sample of all MGNREGA beneficiaries in Upper Subansiri District.

4.3 Data Collection: Primary data were collected through a structured interview schedule administered to the selected beneficiaries. The schedule contained questions concerning demographic characteristics and perceptions relating to economic benefits, plantation survival and maintenance, environmental outcomes and community participation. Field observations were also used to provide contextual understanding of the plantation activities. Secondary information was obtained from relevant government documents and published academic literature.

4.4 Measurement scale: A five-point Likert scale was used to measure respondents' perceptions. The response categories were coded as follows:

Response categories	Coded
Strongly Disagree (SD)	1
Disagree (D)	2
Neutral (N)	3
Agree (A)	4
Strongly Agree (SA)	5

For interpretation of mean scores, the following ranges were used:

Mean score	Interpretation
1.00–2.33	Low
2.34–3.66	Moderate
3.67–5.00	High

4.5 Data Analysis: The collected data were analysed using percentage distributions, mean scores and standard deviations. Percentages were used to describe the distribution of responses while mean scores were used to identify the general direction of respondents' perceptions. Standard deviations were used to indicate the degree of variation in responses.

1. FINDINGS AND ANALYSIS

Table 1. Perceived Economic Effectiveness

Statements	SA%	A%	N%	D%	SD%	Mean	SD
Plantation activities (mainly banana and orange) have improved my household income.	27.8	41.7	6.9	13.9	9.7	3.64	1.28
Income from these plantation activities is sufficient for long-term livelihood support.	13.9	16.7	5.6	29.1	34.7	2.46	1.45

(Source: Primary data)

The two indicators reveal an important distinction between short-term economic benefit and long-term livelihood security. The first statement recorded a mean score of 3.64, indicating a moderately positive perception that plantation activities had improved household income. A combined 69.5 percent of respondents either strongly agreed or agreed with this statement. However, the standard deviation of 1.28 indicates considerable variation in individual experiences.

The second statement produced a substantially lower mean of 2.46. Only 30.6 percent of respondents agreed or strongly agreed that income from plantation activities was sufficient for long-term livelihood support while 63.8 percent disagreed or strongly disagreed. This difference is analytically important. The findings suggest that beneficiaries distinguish between income supplementation and sustainable livelihood security. Plantation activities may provide useful economic assistance without becoming a sufficiently productive and reliable source of long-term household income.

This pattern is consistent with the broader literature indicating that MGNREGA can contribute to household welfare through employment income and asset creation but that longer-term outcomes depend on the productivity and durability of the assets created. Thus, the evidence from Patum does not support an interpretation of plantation activities as a complete livelihood solution. Rather, they appear to operate primarily as a supplementary livelihood intervention.

Table 2. Perceived Plant Survival and Maintenance

Statements	SA%	A%	N%	D%	SD%	Mean	SD
Banana and orange plantations under MGNREGA survive well in my area.	20.8	41.7	11.1	13.9	12.5	3.44	1.33
Proper care and maintenance are provided to these plantations.	55.6	44.4	0.0	0.0	0.0	4.56	0.50

(Source: Primary Data)

The findings reveal a notable divergence between maintenance effort and perceived plantation survival. The statement concerning plant survival recorded a mean score of 3.44, which falls within the moderate range. Although 62.5 percent of respondents agreed or strongly agreed that banana and orange plantations survived well yet 26.4 percent disagreed or strongly disagreed. The standard deviation of 1.33 indicates substantial variation in perceptions.

In contrast, the statement concerning maintenance recorded a very high mean of 4.56, with every respondent agreeing or strongly agreeing that proper care and maintenance were provided. The standard deviation of 0.50 indicates considerable consistency. This result is analytically significant because it suggests that

maintenance activity alone does not necessarily translate into equally strong perceptions of survival. In other words, the existence of maintenance practices and the perceived outcome of those practices are different dimensions of programme effectiveness.

Plant survival can be influenced by factors beyond routine maintenance, including species suitability, soil conditions, rainfall, pests, location and technical planning. MGNREGA technical guidance itself stresses the importance of location-specific species selection and technical support in plantation planning. The implication is that improving plantation effectiveness requires not only continued maintenance but also attention to the ecological suitability and technical design of plantations.

Table 3. Perceived Environmental Benefits

Statements	SA%	A%	N%	D%	SD%	Mean	SD
Existing plantation activities contribute to improving the local environment.	13.9	41.7	12.5	25.0	6.9	3.31	1.23
Limited variety of plantations reduces the overall environmental benefits.	55.5	41.7	2.8	0.0	0.0	4.53	0.55

(Source: Primary Data)

The first indicator produced a mean score of 3.31, indicating a moderate perception of environmental improvement. Although 55.6 percent of respondents agreed or strongly agreed that plantation activities improved the local environment, 31.9 percent disagreed or strongly disagreed. The second indicator, however, recorded a considerably higher mean of 4.53. The respondents strongly perceived limited plantation diversity as a constraint on the broader environmental benefits of plantation activities.

These findings suggest that beneficiaries do not reject the environmental value of plantation activities. Rather, they appear to perceive a constraint within the existing plantation model. The issue is not plantation activity itself but the narrow range of species being used. This finding is relevant to the broader MGNREGA literature. Research on natural-resource-management works indicates that ecological benefits depend substantially on the design, location and technical quality of interventions.

Thus, environmental effectiveness should not be assumed merely from the number of plantations undertaken. This study suggests that species diversification and ecological suitability are important conditions for translating plantation expenditure into broader environmental benefits.

Table 4. Community Participation in Plantation Activities

Statements	SA%	A%	N%	D%	SD%	Mean	SD
Community members participate in existing plantation activities.	27.8	69.4	2.8	0.0	0.0	4.25	0.49
Lack of diverse plantation activities reduces community interest and involvement.	41.7	48.6	2.8	6.9	0.0	4.25	0.78

(Source: Primary data)

This study shows that there was high level of perceived community participation of the plantation programme. The first statement recorded a mean of 4.25 with 97.2 percent of respondents agreeing or strongly agreeing that community members participate in plantation activities. The low standard deviation of 0.49 indicates a high degree of consistency. However, the second indicator introduces an important qualification. The mean of 4.25 indicates strong agreement that limited plantation diversity reduces community interest and involvement.

The two findings together suggest that participation is not simply a function of the existence of MGNREGA plantation activities. Beneficiaries appear to value participation but also associate continued interest with the quality and diversity of the plantation activities. This is consistent with the broader understanding of MGNREGA as a decentralized programme in which local institutions and communities play important roles in planning and implementation. Therefore, the findings indicates a high level of community participation involvement in plantation activities but maintaining that participation may require beneficiaries to perceive meaningful economic and ecological value in the assets being created.

5. Discussion

The findings provide a multidimensional picture of plantation activities under MGNREGA in Patum Gram Panchayat. The evidence does not support a simple classification of the intervention as either successful or unsuccessful. Instead, the four dimensions examined in the study reveal different patterns of perceived effectiveness.

First, beneficiaries distinguish between immediate economic support and long-term livelihood security. The mean score for improvement in household income is 3.64, whereas the mean for long-term livelihood support is only 2.46. This suggests that plantation activities are perceived as providing supplementary economic support but not yet as a sufficiently reliable basis for sustained household livelihood. The finding is consistent with the broader understanding of MGNREGA as a programme in which employment and asset creation can reinforce household welfare while longer-term benefits depend on the productivity and durability of assets created (Drèze & Khera, 2017; Mishra, 2020). Second, the findings reveal a distinction between maintenance and perceived survival. Respondents express very strong agreement that plantations receive proper care and maintenance.

However, perceived survival is considerably lower. This indicates that maintenance inputs alone may not guarantee equally strong outcomes. Species suitability, environmental conditions, technical planning and other local factors may influence plantation survival. This interpretation is consistent with research emphasising science-led and location-specific approaches to natural-resource interventions under MGNREGA (Anantha et al., 2021). Third, plantation diversity emerges as an important issue. Almost all respondents agree that limited plantation variety constrains environmental benefits and similarly high proportion believe that it reduces community interest and involvement.

This provides an important link between the environmental and participatory dimensions of the programme. Diversification may have the potential to broaden the ecological functions of plantations while also increasing the perceived usefulness of plantation activities to participating households. However, the present study measures perceptions and does not establish the actual ecological effects of species diversification. Fourth, community participation is strongly perceived. Nearly all respondents report community involvement in existing plantation activities.

This is consistent with the decentralized character of MGNREGA, under which local institutions and communities are expected to play important roles in planning and implementing works. Nevertheless,

participation should not automatically be equated with substantive empowerment or with successful long-term asset outcomes. In Patum, strong participation coexists with relatively weaker perceptions of long-term livelihood support and plant survival. Overall, the findings suggest that plantation activities occupy an intermediate position between employment support and productive asset creation. Their immediate employment and income-support function appear more evident than their capacity to provide sustained livelihood or environmental benefits.

These findings broadly support earlier research that the effectiveness of MGNREGA natural-resource and horticultural interventions depends on the quality of implementation and the characteristics of the local context (Ambasta et al., 2008; Esteves et al., 2013; Anantha et al., 2021; Mishra, 2020). At the same time, the Patum case adds a localized beneficiary perspective from Arunachal Pradesh, where geographical and ecological conditions differ substantially from the settings examined in much of the existing literature.

6. Conclusion

The study concludes that MGNREGA plantation activities in Patum Gram Panchayat have contributed to employment generation, local participation and plant maintenance, but their longer-term livelihood and environmental benefits remain limited. The findings suggest that plantation effectiveness depends not only on the creation and maintenance of plantations but also on plant survival, species diversity, productivity and ecological suitability. The strong community participation provides a useful foundation for improving plantation outcomes. Greater attention to locally suitable species, post-plantation care and regular monitoring could help transform plantations on activities from short-term employment support into more sustainable livelihood and environmental assets.

7. Policy implications

The findings suggest several areas for strengthening plantation interventions under MGNREGA such as:

- Introduce a wider range of plant species suited to local conditions
- Connect plantation work with income-generating opportunities
- Improve technical support during planning and implementation
- Monitor long-term survival and productivity of plantations
- Encourage local participation in decision-making
- Align plantation efforts with environmental and climate priorities

8. Limitations of the study

The study has several limitations. First, the research was conducted in a single Gram Panchayat and therefore its findings should not be generalized statistically to all plantation activities under MGNREGA. Second, the sample of 72 beneficiaries was selected purposively. Although it represents 60 percent of the identified population, the sampling design does not permit probability-based generalization. Third, the study measures beneficiary perceptions rather than independently verified biological survival rates, changes in household income or quantified environmental outcomes. Consequently, statements concerning survival, income and environmental benefits should be interpreted as perceived outcomes. These limitations do not undermine the usefulness of the study, rather they define the scope within which its findings should be interpreted.

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