Asian Journal of Economics, Business and Accounting

Volume 24, Issue 10, Page 191-201, 2024; Article no.AJEBA.124750
ISSN: 2456-639X

Birsa Harit Gram Yojana: Fostering Rural Employment through Afforestation and Sustainable Development in Jharkhand, India

M.N Zubairi [a++] and Namita Toppo [a#*]

[a] University Department of Commerce and Business Management, Ranchi University, Ranchi, Jharkhand, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/ajeba/2024/v24i101522

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/124750

Original Research Article

Received: 02/08/2024
Accepted: 05/10/2024
Published: 08/10/2024

ABSTRACT

In recent years, there has been a growing awareness of environmental concerns and the necessity for sustainable development. The Birsa Harit Gram Yojana (BHGY), a flagship initiative launched by the Government of Jharkhand, seeks to promote rural development through environmental conservation. Drawing inspiration from the vision of tribal freedom fighter Birsa Munda, the scheme aims to revitalize rural landscapes, enhance livelihood opportunities, and promote sustainable growth. This article provides a detailed analysis of BHGY in Jharkhand, exploring its objectives, implementation strategies, impact on environmental sustainability and its role in generating

---

[++] *Associate Professor;*
[#] *Research Scholar;*
**Corresponding author: E-mail: namita.anjali@gmail.com, namita.anjali5@gmail.com;*

Cite as: *Zubairi, M.N, and Namita Toppo. 2024. "Birsa Harit Gram Yojana: Fostering Rural Employment through Afforestation and Sustainable Development in Jharkhand, India". Asian Journal of Economics, Business and Accounting 24 (10):191-201. https://doi.org/10.9734/ajeba/2024/v24i101522.*

employment. Based on government reports and academic research, the article emphasizes the importance of BHGY as a transformative initiative in rural development within Jharkhand. This article examines the year over year trends in total beneficiaries, land area covered and fruit trees planted under BHGY across all districts of the state during FY 2021-22 AND FY 2022-23. Using paired t-tests, the statistical significance between the data of the two fiscal years were analyzed. The results indicate no significant changes between the two years for the total number of beneficiaries, the total area in acres pr the total number of fruit trees planted with p-values of 0.2835, 0.4369 and 0.4444 respectively. These findings suggest that the scheme outcomes remained stable across the two years with ant observed differences likely due to random variation. The results highlight the consistency in scheme implementation and offer insights for future planning and resource allocation.

Keywords: Birsa harit gram yojana; employment generation; Jharkhand; rural development; sustainable development.

1. INTRODUCTION

Jharkhand, carved out of Bihar in the year 2000, has a predominantly rural landscape characterized by dense forests, fertile plains and tribal-dominated regions. The state boasts as a rich legacy of tribal heritage with indigenous communities such as the Santhal, Munda and Oraon forming the cultural bedrock of Jharkhand. However, despite its natural wealth and cultural heritage, it grapples with a myriad of challenges that hinder its progress. The rampant deforestation driven by mining and industrial activities has led to ecological imbalance and loss of biodiversity in the state. Moreover, the agrarian economy of Jharkhand faces challenges such as low agricultural productivity, lack of irrigation facilities, and vulnerability to climate change induced shocks. Additionally, high levels of poverty, unemployment and social inequality persist in rural areas, particularly among tribal communities [1-3].

One of the key aspects of sustainable development is ensuring a balance between economic growth and environmental conservation. The Birsa Harit Gram Yojana is a significant step towards achieving this balance. By promoting afforestation and sustainable development in rural areas, the initiative not only contributes to environmental conservation but also fosters rural employment opportunities [4-6].

Afforestation, the practice of planting trees in areas where there were no trees before, plays a crucial role in mitigating climate change, preserving biodiversity, and improving the overall quality of the environment. The Birsa Harit Gram Yojana aims to leverage afforestation as a means to create sustainable livelihoods for rural communities. Through the implementation of this initiative, not only will the environmental benefits be realized, but rural communities will also have the opportunity to engage in activities such as tree planting, nurturing, and maintenance, which will provide them with a source of income and contribute to the overall development of their communities. The Birsa Harit Gram Yojana recognizes the importance of involving local communities in the afforestation process. The approach of involving local communities ensures that the benefits of afforestation are not only environmental but also socio-economic [7,8].

The Birsa Harit Gram Yojana launched by the Government of Jharkhand in 2020 aims to confront the array of challenges hindering sustainable development in the state. It aims to empower rural communities by addressing issues like deforestation, declining agricultural productivity, poverty and limited rural employment opportunities [9,10]. The BHGY embodies the spirit of sustainable development and community empowerment. It seeks to rejuvenate rural landscapes, enhance livelihood opportunities and promote environmental sustainability across the state. It focuses on harnessing the innate potential of rural communities and preserving the ecological wealth of Jharkhand [11].

BHGY was conceptualized with a set of overarching objectives aimed at transforming rural landscapes and improving the well-being of rural communities in Jharkhand. The key objectives of BHGY are as follows:

i. *Afforestation and Reforestation*: The scheme aims to enhance green cover and biodiversity through extensive afforestation and reforestation efforts. This objective is particularly crucial for dealing with

increasing environmental degradation and climate change. By planting trees and restoring degraded forests, the scheme aims to alleviate the adverse effects of deforestation, soil erosion and loss of biodiversity. The scheme involves the plantation of native tree species including fruit-bearing trees, medicinal plants and species with high ecological value. These plantations benefit the environment and offers economic opportunities for rural communities through sustainable forest management practices such as agroforestry and non-timber forest produce collection.

ii. *Watershed Management*: The scheme implements measures for watershed management, aimed at conserving water resources which prevents soil erosion and improves agricultural productivity in rural areas. Watershed Management involves the implementation of various techniques such as contour trenching, check dams and soil conservation measures to enhance water retention and soil fertility. The scheme focuses on identifying and prioritizing critical watersheds, implementing soil and water conservation measures, promoting rainwater harvesting and enhancing community participation in water resource management.

iii. *Sustainable Agriculture*: The scheme emphasizes to promote sustainable agriculture practices for enhancing food security, improving livelihoods and conserving natural resources in rural areas. The scheme encourages the farmers to adopt climate-resilient crop varieties, practice water efficient irrigation techniques and use organic manures and biofertilizers to reduce their dependence on synthetic inputs and promote soil health. The farmers are also provided with capacity building programs and extension services to impart knowledge and skills in sustainable agriculture practices.

iv. *Livelihood Generation*: The scheme recognizes the importance of economic empowerment in alleviating poverty and promoting inclusive growth in rural communities. It aims to generate employment through various activities such as afforestation, watershed management, sustainable agriculture, agro-processing and eco-tourism. The scheme focuses on skill development, entrepreneurship promotion and value addition in agriculture and allied sectors to create diverse and sustainable livelihood options for rural communities.

v. *Empowerment of Local Communities*: The scheme aims to empower local communities by promoting their active participation in project planning, implementation and monitoring processes. The development of community-based organization, self-help groups and village-level institutions guarantee the fair distribution of gains from the scheme and facilitate effective governance. Additionally, the focus is given to the empowerment of women and marginalized groups through targeted interventions such as gender-sensitive capacity-building programs and affirmative action measures.

A wide range of strategies are used for guiding the BHGY implementation in Jharkhand with the objective of accomplishing its goals in an efficient and long-lasting approach. These strategies include technology adoption, capacity building, stakeholder involvement and program design. The strategies for the implementation of BHGY are:

i. *Institutional Framework*: One of the key elements of the scheme is the establishment of a strong institutional framework at different government levels. This framework includes dedicated institution at the state, district and block levels to oversee program implementation, coordination and monitoring. These institutional structures serve as platforms for inter-departmental collaboration, stakeholder engagement and participatory decision-making to foster teamwork and coherence. They facilitate the mobilization of resources, the dissemination of information and the monitoring and evaluation of program outcomes ensuring transparency, accountability and efficiency in the delivery of program.

ii. *Community Participation*: Active involvement of local communities, particularly tribal groups are essential to ensure the relevance, ownership and sustainability of BHGY interventions and also to harness the knowledge, skills and resources of rural communities in achieving program objectives. The scheme adopts a participatory approach to project planning, implementation and monitoring wherein local communities are

actively engaged in identifying their needs, setting priorities and designing appropriate interventions. The capacity building programs and awareness campaigns are conducted to empower the local communities with the knowledge and skills needed to actively participate in the program.

iii. *Capacity building*: Capacity building targets a wide range of beneficiaries including government officials, frontline workers, community leaders and rural entrepreneurs to ensure that they are equipped with the necessary tools and competencies to effectively implement the program. The capacity building programs covers thematic areas such as environmental conservation, sustainable agriculture, watershed management, livelihood promotion and community development.

iv. *Technology Adoption*: The adoption of modern technologies is utilized across various stages of program delivery, including planning, monitoring, evaluation and knowledge dissemination to facilitate informed decision-making and optimize resource utilization. Remote sensing, geographic information systems (GIS) and satellite imagery are used for mapping and spatial analysis of natural resources, land use patterns and environmental changes in project area which helps in identifying priority areas for intervention, monitoring the progress of the schemes' activities and assessing the impact of program interventions on the ground. The mobile applications and digital platforms are leveraged for data collection, real-time monitoring and reporting of program outcomes which enables the field workers and community volunteers to capture information on project activities, beneficiary profiles and resource utilization for facilitating timely feedback, corrective action and performance tracking.

v. *Convergence with Other Programs*: The scheme is designed to complement and converge with other government schemes and initiatives related to rural development, agriculture, water management and tribal welfare to maximize impact and optimize resource utilization. It collaborates with various departments and agencies to leverage their expertise, resources and networks for the successful implementation of program activities.

1.1 Literature Review

Afforestation initiatives are a favored method for restoration of forest cover. There are 151 afforestation initiatives across Indian states and union territories. The highest number of schemes are found in states like Uttar Pradesh and Odisha. Tree Outside Forests and the state's level of urbanization have been proven to have substantial correlation with the number of afforestation projects, indicating that these factors are major drivers of the number of afforestation schemes in Indian states and union territories. It is important to formulate afforestation schemes that take into account state specific afforestation elements such as changes in land use, rather than making generalizations based solely on urbanization in order to meet the greening targets [12].

Agroforestry is a vital tactic for accomplishing India's climate goals and diversifying farmer livelihoods but institutional and financial barriers have made it difficult for it to be adopted. The growth in agroforestry is largely dependent on fiscal mechanisms and cohesive policy. While financing for the Horticulture Scheme (NHM) is linked to declines in tree cover, a greater funding for MGNREGA is associated with considerable gains in tree cover area. The expert interviews identify important limitations such as inaccessibility, a complex web of agroforestry incentives and the absence of a private market for wood products. The initiatives such as encouraging the growth of private markets, improving policy coordination and simplifying incentives can support agroforestry and expand tree cover [7].

MGNREGA improved environmental activities, reduced climate change vulnerability and increased investments and jobs to rural areas. The environmental activities such as carbon retention, soil fertility, increased water storage in tanks, ground water recharge etc. have encouraged and positively impacted the livestock and agriculture productivity. The efforts of MGNREGA minimized the vulnerability of livelihoods, agricultural output and water resources to inconsistent and low rainfall, water scarcity and low soil fertility [13].

In order to achieve poverty alleviation, environmental stability and ecological balance the government needs to emphasize on avoiding forced evictions of rural population and traditional forest dwellers for infrastructure projects and

provide them with relocation options and compensation. The government may also consider granting forest property rights to the local communities on a trial basis to encourage sustainable development. There should be collaboration for bioprospecting between indigenous communities with traditional knowledge and pharmaceutical firms, based on proven global models that lower biopiracy and improve livelihoods. The government programs such as MGNREGA, CAMPA, ecotourism and agroforestry have the potential to boost the income of rural population (Sankar, U., 2024).

The study examines the Birsa Harit Gram Yojana initiative under the Mahatma Gandhi National Rural Employment Guarantee Scheme in Jharkhand, focusing on creating sustainable income for tribal households through horticulture. The pilot projects have demonstrated positive results, improving the economic and social status of participating families. However, the study also identifies several challenges such as government indifference, lack of awareness about the scheme, delayed payments and scalability issues. It emphasizes the importance of sustainable income generation and the potential role of horticulture in enhancing Jharkhand's economy. Furthermore, the study includes references related to empowerment, smallholder farming, agricultural statistics and rural employment guarantee schemes in various states of the country. These references cover topics like women empowerment, socio-economic development, the effectiveness of government programs in improving rural livelihoods [9].

The Birsa Harit Gram Yojana mango plantation initiative offers a sustainable way to stabilize agricultural livelihoods by enabling farmers to invest in their land. Mango plantations are highly labor-intensive making them suitable for employment generation under MGNREGA. The successful implementation of the scheme depends on the strict adherence to the standard operating procedures including quality control during raw material procurement and customized irrigation and spraying schedules based on soil types to reduce plant mortality [6].

1.2 Objectives of the Study

The present study has been undertaken with the following objectives:

- To examine the consistency in the total beneficiaries for both FY 2021-22 and FY 2022-23.
- To assess the variation in total area (in acres) covered by BHGY for both FY 2021-22 and FY 2022-23.
- To evaluate the change in total fruit trees planted between FY 2021-22 and FY 2022-23.

2. RESEARCH METHODOLOGY

Research undertaken in this work considers the Birsa Harit Gram Yojana in Jharkhand by comparing their key metrics for years 2021-22 and 2022-23 as well as examining the year-on-year trends. This study now zeroes in on three main outcome variables.

i. **Total Beneficiaries:** This is the total number of households which were able to take advantage of the BHGY scheme.
ii. **Land Area Covered:** This is the total in acres which was brought under afforestation or other related activities under the BHGY.
iii. **Fruit Trees Planted:** This is the number of fruit trees that were planted in the course of BHGY.

2.1 Hypotheses

Regarding Total Beneficiaries:

i. Null Hypothesis (H0): There exists no possible growth trend in terms of the average number of beneficiaries who subscribed to the BHGY scheme in FY 2021-22 and FY 2022-23.

ii. Alternative Hypothesis (H1): There exists a growth trend in terms of the average number of beneficiaries who subscribed to the BHGY scheme in FY 2021-22 and FY 2022-23.

Regarding Land Area Covered:

i. Null Hypothesis (H0): There exists no possible increase in the mean land covered under the BHGY scheme who's duration has been between FY 2021-22 and FY 2022-23.

ii. Alternative Hypothesis (H1): There exists an increase in the mean land area that was covered under the BHGY scheme who's duration has been between FY 2021-22 and FY 2022-23.

Regarding Fruit Trees Planted:

i. Null Hypothesis (H0): In comparison of the mean number of fruit trees planted under the BHGY scheme in FY 2021-22 and in FY 2022-23, there is no statistically meaningful growth.

ii. Alternative Hypothesis (H1): Between the FY 2021-22 and the FY 2022-23, there is a

statistically meaningful growth in the mean number of the fruit trees planted under the BHGY scheme.

2.2 Data Collection

The data concerning these variables was gathered from all districts of Jharkhand for a period of two financial years. This information is retrieved from the Economic Survey Report of Jharkhand for the year 2022-23.

2.3 Data Analysis

This study made use of quantitative data analytical techniques on the data collected. In particular, the data were into consideration for conducting paired t-tests to ascertain any statistically significant differences in every one of the outcome variables between FY 2021-22 and FY 2022-23. Each of the t-test subjected to a determinate measure of significance known as the p-value. It was possible to test this hypothesis p-value and if it fell below some specified level of significance (0.05 most times) then, the null hypothesis would be said to be rejected necessitating the conclusion that there was a statistically significant difference between the two years. This is systematic as it facilitates effective evaluation of the scheme's achievement over the period and attempts to find out if any changes observed are as a result to programme effect or circumstance.

3. RESULTS AND DISCUSSION

Table 1 depicts the following findings:

- There was a total of 23,544 beneficiaries across all districts in FY 2021-22 which increased to 24,731 beneficiaries in FY 2022-23. This indicates a growth in the number of individuals benefiting from the Birsa Harit Gram Yojana initiative.
- The total area utilized was 20,647.82 acres in FY 2021-22 which increased slightly to 21,350.78 acres in FY 2022-23. This shows an ongoing effort in the utilization of land for the purpose of agricultural expansion and afforestation.

A total of 23,12,556 fruit trees were planted across all districts in FY 2021-22 which rose to 23,91,287. This increase shows a consistent effort in tree plantation initiatives which contributes to environmental sustainability and enhance local agriculture.

Table 2 depicts the following:

- The correlation between the data of two fiscal years is 0.9456 which indicates a very strong positive correlation. This suggests that the number of beneficiaries in FY 2021-22 and FY 2022-23 move together closely.
- The p-value is 0.2835, which is greater than 0.05, therefore there is no statistically significant difference between the total beneficiaries in both fiscal years.
- The null hypothesis (H0) is failed to be rejected.

Table 3 depicts the following:

- The correlation between the two years is 0.9269, which indicates a very strong positive relationship. This suggests that the total area in FY 2021-22 and FY 2022-23 is closely related.
- The p-value is 0.4369, which is greater than 0.05 indicating no significant difference in the total area in acres between the two fiscal years.
- The null hypothesis (H0) is failed to be rejected.

Table 4 depicts the following:

- The correlation between the two sets of data is 0.9267, which indicates a very strong positive relationship. This suggests that the number of fruit trees planted in FY 2021-22 is strongly related to the number of trees planted in FY 2022-23.
- The p-value is 0.4444, which is greater than 0.05, suggesting no statistically significant difference in the total number of fruit trees planted between both fiscal years.
- The null hypothesis (H0) is failed to be rejected.

Table 5 depicts the following:

- There is 5.04% increase in the number of beneficiaries adding 1,187 new beneficiaries in FY 2022-23.
- The area under cultivation increased by 702.96 acres which is 3.40% rise from the previous year.
- The number of fruit trees planted grew by 78,731 in numbers which is 3.40% increase.

Table 1. District-wise Progress under Birsa Harit Gram Yojana (BHGY)

District	Total Beneficiary		Total Area in acres		Total number of fruit trees planted		Total Beneficiary (Cumulative)	Total Area in acres (Cumulative)	Total number of fruit trees planted (Cumulative)
	FY 2021-22	FY 2022-23	FY 2021-22	FY 2022-23	FY 2021-22	FY 2022-23			
Bokaro	902	993	825	922	92344	103264	1895	1747	195608
Chatra	794	765	765	750	85680	83944	1559	1515	169624
Deoghar	1217	1352	1217	1209	136304	135408	2569	2426	271712
Dhanbad	668	601	492	358	55104	40096	1269	850	95200
Dumka	948	1038	949	1000	106232	112000	1986	1949	218232
East Singhbhum	822	753	671	572	75917	64075	1575	1244	139272
Garhwa	696	969	696	852	77952	95424	1665	1548	173376
Giridih	1455	1393	1348	1277	150920	142997	2848	2624	293917
Godda	663	589	660	530	73948	59304	1252	1190	133252
Gumla	3285	2626	2459	2272	275408	254464	5911	4731	529872
Hazaribagh	738	800	660	637	73864	71288	1538	1296	145152
Jamtara	800	619	768	502	86016	56168	1419	1270	142184
Khunti	1980	2170	1401	1809	156957	202621	4150	3211	359578
Koderma	349	778	307	746	34384	83552	1127	1053	117936
Latehar	561	713	509	614	57008	68712	1274	1123	125720
Lohardaga	540	740	481	682	53872	76328	1280	1163	130200
Pakur	564	658	478	524	53840	58688	1222	1002	112168
Palamu	723	901	723	899	80976	100688	1624	1622	181664
Ramgarh	790	879	616	650	68992	72800	1669	1266	141792
Ranchi	1849	1652	1609	1391	180172	155792	3501	3000	335964
Sahebganj	400	388	387	296	43344	33096	788	683	76440
Saraikela-Kharsawan	560	545	558	460	62534	51554	1105	1019	114088
Simdega	1081	1488	1065	1335	119224	149520	2569	2400	268744
West Singhbhum	1169	1321	1006	1067	112644	119504	2490	2073	232148
Total	**23544**	**24731**	**20647.82**	**21350.78**	**2312556**	**2391287**	**48285**	**41998.60**	**4703843**

Source: Department of Rural Development, Government of Jharkhand

Table 2. Total Beneficiaries

Total Beneficiaries		
	FY 2021-22	FY 2022-23
Mean	981.4167	1030.458
Variance	408143.6	286493.6
Observations	24	24
Pearson Correlation	0.945681	
Hypothesized Mean Difference	0	
df	23	
t Stat	-1.09793	
P(T<=t) one-tail	0.141797	
t Critical one-tail	1.713871	
P(T<=t) two-tail	0.283594	
t Critical two-tail	2.068658	

Table 3. Total Area in Acres

Total area in acres		
	FY 2021-22	FY 2022-23
Mean	860.4167	889.75
Variance	228517.5	222538.5
Observations	24	24
Pearson Correlation	0.926937	
Hypothesized Mean Difference	0	
df	23	
t Stat	-0.79115	
P(T<=t) one-tail	0.218469	
t Critical one-tail	1.713871	
P(T<=t) two-tail	0.436938	
t Critical two-tail	2.068658	

Table 4. Total number of Fruit Trees Planted

Total number of fruit trees planted		
	FY 2021-22	FY 2022-23
Mean	96401.5	99636.96
Variance	2.86E+09	2.79E+09
Observations	24	24
Pearson Correlation	0.926703	
Hypothesized Mean Difference	0	
df	23	
t Stat	-0.77808	
P(T<=t) one-tail	0.222226	
t Critical one-tail	1.713871	
P(T<=t) two-tail	0.444451	
t Critical two-tail	2.068658	

Table 5. Year-wise Comparison of BHGY

	FY 2021-22	**FY 2022-23**	**Total (Cumulative)**	**Increase in Numbers**	**Percentage increase**
Total Beneficiary	23544	24731	48285	1187	5.04%
Total Area in Acres	20647.82	21350.78	41998.60	702.96	3.40%
Total Number of fruit trees planted	2312556	2391287	4703843	78731	3.40%

Source: Author's Computed

Impact of Birsa Harit Gram Yojana:

- *Greening of Rural Areas*: The goal of BHGY is to plant trees across large tracts of rural land, particularly unused government and private land which led to an increase in green cover percentage of the state which was facing significant deforestation issues due to mining and urbanization.
- *Mitigation of Climate Change*: The increased green cover contributes to carbon sequestration which helps in mitigating the adverse effects of climate change in the state.
- *Employment for Rural Population*: BHGY scheme is integrated with MGNREGA ensuring that the rural population is provided with 100 days pf wage employment through afforestation and horticulture projects.
- *Long term income from Agroforestry*: The BHGY scheme promotes planting of fruit bearing trees such as mango. Guava, jackfruit and other economically beneficial crops. After the initial plantation work, the rural families can harvest these crops for income creating a sustainable source of livelihood.
- *Women empowerment*: The BHGY scheme focuses on the participation of women from tribal and backward communities in the tree plantation and maintenance activities which has led to an increase in their financial independence and enhanced their role in decision making processes at the village level.
- *Revival of Traditional Agricultural Practices*: The BHGY scheme has helped in the preservation of traditional agricultural knowledge and the cultivation of indigenous plant varieties.
- *Soil Erosion Control*: The tree plantation has a direct effect on soil conservation and prevention of erosion which is critical in many hilly and undulating areas of Jharkhand. The increased green cover has also resulted in the improvement of water retention capacity of the state by reducing surface run-off.

Criticisms of Birsa Harit Gram Yojana:

- *Land Disputes*: In some areas, conflicts have arisen over the use of land for afforestation, particularly on lands that were traditionally used for grazing or other community purposes.
- *Sustainability of the Program*: The long-term survival of plantations requires continuous support and maintenance which can be a challenge given the limited resources of local governing bodies.
- *Ineffective Monitoring*: There is a lack of a robust monitoring and evaluation system to track the progress and outcomes of the scheme. Without proper data on the survival rate of planted trees, income generation and environmental impact, it is difficult to assess the overall success of the program.
- *Lack of Local Engagement*: In some areas, the scheme has been criticized for not sufficiently engaging local communities in the maintenance and protection of the plantations. This creates a gap in ownership where locals put no efforts for the success of the plantation scheme.
- *Temporary nature of Employment*: The scheme has been criticized for the temporary nature of the employment which are limited mostly to the plantation phase. Once the plantation work is completed the employment opportunities diminish, leaving many without sustained income.
- *Unfulfilled promise of livelihoods*: Though the scheme promised long-term income through agro-forestry, it takes several years before the trees start producing fruit. For many families depends on immediate economic benefits, the delay in returns makes the scheme less attractive.

Suggestions for the Improvement of Birsa Harit Gram Yojana:

- *Strengthen Implementation Process*: The administration should simplify approval and disbursement processes at the district and block levels to reduce bureaucratic delays. A clear timeline should be scheduled for approval and implementation of the project.
- *Establish Long-term Maintenance Plans*: A dedicated maintenance fund should be created for taking care of the saplings for at least the first 3-5 years after plantation. The local community should be involved for taking care of the plantations.
- *Introduction of Agroforestry Training Programs*: The rural population should be

provided training on agroforestry practices such as tree care, horticulture and marketing of the produce.

- *Link scheme to Market Access*: The sale of the fruits and other forest produce from the plantations should be linked to the market which can ensure that farmers receive fair prices for their produce.
- *Priority to Indigenous Species*: The scheme should focus on planting native species which will contribute to local biodiversity and better ecological balance. The species will be more resilient and help in improving soil health and water conservation.

4. CONCLUSION

The Birsa Harit Gram Yojana initiative is making measurable progress in increasing the number of beneficiaries, expanding the area under cultivation and planting more fruit trees. The growth in these areas reflects the scheme's effectiveness in reaching more beneficiaries, utilizing more land for sustainable agriculture practices and enhancing long-term productivity through horticulture. Despite challenges, these incremental increases indicate the scheme's potential to contribute significantly to the economic and social upliftment of the participating communities in Jharkhand. The paired t-tests conducted on the data for total beneficiaries, total area in acres and total number of fruit trees planted across FY 2021-22 and FY 2022-23 indicated that there are no statistically significant differences between the two fiscal years. Specifically, the p-values for all three variables are greater than 0.05 significance level, which means that any observed variations could be attributed to random fluctuations rather than meaningful changes. Overall, the data suggest that the number of beneficiaries, area covered and trees planted remained relatively consistent between the two fiscal years.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Baldock D, Dwyer J, Lowe P, Petersen JE, Ward N. The nature of rural development: towards a sustainable integrated rural policy in Europe. Synthesis Report; 2001 Jan.
2. Bloomfield G, Bucht K, Martínez-Hernández JC, Ramírez-Soto AF, Sheseña-Hernández I, Lucio-Palacio CR, Ruelas Inzunza E. Capacity building to advance the United Nations sustainable development goals: An overview of tools and approaches related to sustainable land management. Journal of sustainable forestry. 2018 Feb 17;37(2):157-77.
3. Jharkhand Economic Survey 2022-23.
4. Kim G, Kim J, Ko Y, Eyman OT, Chowdhury S, Adiwal J, Lee W, Son Y. How do nature-based solutions improve environmental and socio-economic resilience to achieve the sustainable development goals? Reforestation and afforestation cases from the republic of korea. Sustainability. 2021 Nov 4;13(21):12171.
5. McElwee P, Calvin K, Campbell D, Cherubini F, Grassi G, Korotkov V, Le Hoang A, Lwasa S, Nkem J, Nkonya E, Saigusa N. The impact of interventions in the global land and agri-food sectors on Nature's Contributions to People and the UN Sustainable Development Goals. Global Change Biology. 2020 Sep;26(9):4691-721.
6. Nair N. The return of mangoes: An Evaluation of MGNREGA Plantation Projects in Jharkhand; 2023. Available at SSRN 4586710.
7. Pandey S. Fiscal incentives for green growth: A mixed-methods study of the state of agroforestry and tree cover in India; 2024.
8. Priyadarshini P, Abhilash PC. Fostering sustainable land restoration through circular economy-governed transitions. Restoration Ecology. 2020 Jul;28(4):719-23.
9. Shankar P, Bhaskar P, Hans A. An exploratory study on recent inclusive approach under mgnregs for underprivileged women, Tribal Community & Smallholders Becoming Self-reliant (Atmanirbhar) in Jharkhand State in India. Journal of Educational Management and Social Sciences. 2021;2(1):66-79.

10. Singh S, Singh G. Agroforestry for sustainable development: Assessing frameworks to drive agricultural sector growth. Environment, Development and Sustainability. 2023 Jul 17:1-37.
11. Smith J. Afforestation and reforestation in the clean development mechanism of the Kyoto Protocol: implications for forests and forest people. International Journal of Global Environmental Issues. 2002 Jan 1;2(3-4):322-43.
12. Yadav H, Sasaki T. Afforestation Schemes Are Driven by Urbanisation and Tree Outside Forest: A Case Study of India. Anthropocene Science. 2024;1-7.
13. Yadav P, Jha RK, Parasriya R, Toushif PK, Jain V, Mallesh Y. MGNREGA-Assisted Afforestation for Climate Moderation in India: An Overview. International Journal of Environment and Climate Change. 2024;14(2):310-321.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/124750