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Factors behind under-utilization of wasteland and prospects for their development in Nalanda district of Bihar

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Abstract

The present study focused on the exploration of wasteland utilization in the Nalanda district of Bihar. Information gathering involved surveying 140 families through questionnaires and conducting field visits to assess the current status and potential opportunities for utilizing these lands. By examining the perspectives and practices of local communities, the study aimed to identify strategies for unlocking the productive potential of wastelands and promoting sustainable land management practices in the region. The study shows that 0.07 acre land per family was found to be as wastelands. The total area under trees was estimated at around 58.19 acre which is about 19.00 percent of the area of the surveyed families; most of the trees were found on cultivated land. Among the different tree species present in area *Albizia lebbeck* (38.57%), *Bamboo* spp. (26%), *Acacia nilotica* (Babul) (24.28%) and *Tectona grandis* (Teak) (20.71%) was grown on individual household land area of families. Various reason was observed for peoples are not practicing the planting of tress on wasteland such as lack of awareness (71.42%), lack of quality planting material (54.28%), lack of time (48.57%) due to engaged in tradition agricultural practices and other job work, marketing problems (30%), very small returns from trees (22%), very late return from the trees (17.85%) and damage from cattle and wild animal (17.85%). The perspectives of the farmers towards adaptation of planting trees on the wasteland was also collected and it was showed positive response as - 75.71% respondent families are favored for raising multipurpose tree plantation on wasteland, 20.71% families preferred horticulture trees and remaining 4.28% indicated preference for other plants. Hence, it may conclude that wasteland of the district may be systematically utilized under forestry, horticulture land Agroforestry sectors for optimum utilization of land. Also helpful to develop forest base green economic generated model like Aquaculture, Beekeeping, Sericulture and Silvopastural etc. which may increase the socioeconomic status of the families.

Keywords: Wasteland, agroforestry, forestry, horticulture, multipurpose trees

Introduction

Wastelands encompass areas of land that have remained unutilized for agricultural, pasture, or forestry purposes, often characterized by their barren nature and low productivity. According to data from the Central Water Commission of India, out of the total land area of 329 million hectares in the country, more than 40 million hectares are unavailable for cultivation due to non-agricultural uses. Additionally, there are 23 million hectares classified as fallow land and 15 million hectares designated as culturable wasteland.

In the specific case of the Nalanda district in Bihar, the Wasteland Atlas of India report for 2010 indicates that the wasteland area covers approximately 3.57 square kilometers out of a total land area of 2367 square kilometers. This underutilization of land prompted the initiation of a survey to assess the factors contributing to the lack of utilization of wastelands and to explore the potential for their development in Nalanda District. The survey aimed to gain insights into the underlying reasons for the underutilization of wastelands and to identify opportunities for their productive utilization. By understanding the factors contributing to the neglect of these lands and evaluating their potential for development, the study sought to inform strategies and policies aimed at unlocking the productive potential of wastelands in Nalanda District, thereby contributing to sustainable land management and rural development initiatives.

Materials and Methods

Study Area

The current research study was conducted within the geographical boundaries of Nalanda district, situated in the state of Bihar, India. Nalanda district is positioned within the larger geographic context of the Mid-Ganga basin, located along the southern margin of the Gangetic plains, with its southern extent bordering the Chhota Nagpur area. Geographically, Nalanda district spans latitudinal coordinates ranging from 24°57'57.78"N to 25°27'39.636"N and longitudinal coordinates ranging from 85°09'54.9"E to

85°55'27.084"E. Covering a total area of approximately 2367 square kilometers, Nalanda district predominantly comprises flat alluvial terrain, characteristic of the Gangetic plains. However, the southern region of the district features the prominent Rajgir hills, which represent a notable topographic feature within the otherwise predominantly flat landscape.

The geographic positioning and physical characteristics of Nalanda district play a significant role in shaping its socio-economic and environmental dynamics. The district's location within the Mid-Ganga basin and its proximity to the Gangetic plains highlight its importance in terms of agriculture, water resources, and overall regional development. Additionally, the presence of the Rajgir hills adds diversity to the district's landscape and contributes to its ecological richness. Understanding the geographical context of Nalanda district is crucial for contextualizing the research findings and insights derived from the investigation. It provides valuable information about the district's physical environment, natural resources, and potential challenges and opportunities for sustainable development and land management initiatives.

Methodology

The data collection process for this study was conducted between February to March 2017, employing a household questionnaire survey approach. Both primary and secondary sources of data were utilized to gather comprehensive information for analysis. Out of the twenty administrative blocks within Nalanda district, a representative sample comprising 75% of the blocks, totaling fifteen blocks, was randomly selected to ensure broad coverage across the district's geographic and demographic diversity. The selected blocks included Nursarai, Harnaut, Islampur, Rajgir, Asthawan, Hilsa, Biharsharif, Ekangarsarai, Ben, Nagarnausa, Karaiparsurai, Silao, Parwalpur, Bind, and Tharthari. Within each selected block, a further 5 to 6 villages were chosen for detailed investigation. During the survey process, various methods such as informal group contacts and personal, door-to-door interactions were employed to gain insights into the agricultural practices, socio-economic conditions, and overall livelihood patterns prevalent in the study area.

These interactions facilitated a nuanced understanding of the local context and provided valuable insights into the agricultural and socio-economic dynamics of the study area. In each village, a minimum of five families were randomly selected as respondents. In cases where villages had larger populations, the number of respondents was adjusted proportionally based on population size and area coverage. It's worth noting that the unit of land measurement used locally in the study area is the "bigha". By employing a combination of systematic sampling techniques and qualitative engagement methods, the data collection process aimed to capture a representative snapshot of the agricultural and socio-economic landscape within Nalanda district. This comprehensive approach ensured the robustness and reliability of the data obtained, facilitating a thorough analysis of the factors influencing land use, agricultural practices, and rural livelihoods in the study area.

Results and Discussion

Based on the survey conducted, the findings reveal that the average landholding per capita in Nalanda district is 2.69 bigha. Analysis of land quality distribution per family indicates that a significant majority of farmers, comprising 87.85%, possess good quality land, while 28.57% have land of moderate quality, and 25.71% have wasteland, as depicted in Table 1.

The utilization of wasteland in Nalanda district, as illustrated in Figure 2, indicates that over half of the farmers, accounting for 52.14%, utilize wasteland for storing crops, followed by livestock rearing (43.57%) and tree plantation (43.57%). However, it is noted that these activities are often temporary and do not yield expected returns from the land.

Further examination, as shown in Table 3, highlights the barriers hindering tree plantation on wastelands, with the primary obstacles cited by farmers being a lack of knowledge or awareness (71.42%), insufficient planting materials (54.28%), limited time (48.57%), and marketing challenges (30%).

Additionally, Figure 3 indicates that farmers in Nalanda district exhibit a preference for multipurpose tree species over horticultural and other varieties. he figures represent the estimated profits generated by each model within a specific cycle on a per bigha basis.

- **Pisciculture:** The profit per bigha per cycle for pisciculture (fish farming) is 44,503.78 Rs.
- **Poultry:** Poultry farming yields a profit of 46,400 Rs. per bigha per cycle.
- **Bamboo Plantation:** The profit generated from bamboo plantation is notably higher at 270,000 Rs. per bigha per cycle.

The table provides valuable information regarding the profitability of different non-traditional models for utilizing wastelands, aiding in decision-making for land utilization strategies.

Notably, successful non-traditional models observed in the district include pisciculture, poultry farming, and bamboo plantation, which have proven more beneficial compared to traditional uses of wasteland, as depicted in Table 3.

Table 1: Land quality distribution per family

Parameter	Land quality distribution per family (Bigha)			Farmers (%)
	Mean	Min.	Max.	
Good	3.88 ± 0.38	1	40	87.85
Moderate	0.88 ± 0.24	0.5	27.5	28.57
Poor	0.97 ± 0.20	0.5	24	12.85
Wasteland	0.18 ± 0.03	0.2	2	25.71

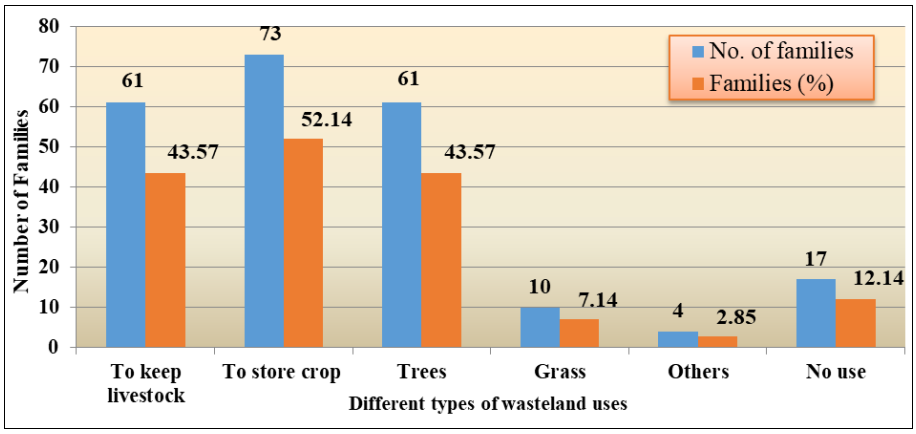

Fig 1: Use of wasteland

Table 2: Reasons for not planting trees on wasteland in Nalanda district

S/No.	Reasons	No. of family	Farmers (%)
1	Damage from cattle and wild animal	14	10.00
2	Very late return	25	17.85
3	Very small return	32	22.85
4	Lack of knowledge/awareness	100	71.42
5	Lack of planting material	76	54.28
6	Lack of time	68	48.57
7	Marketing problem	42	30.00
8	Others	11	07.85

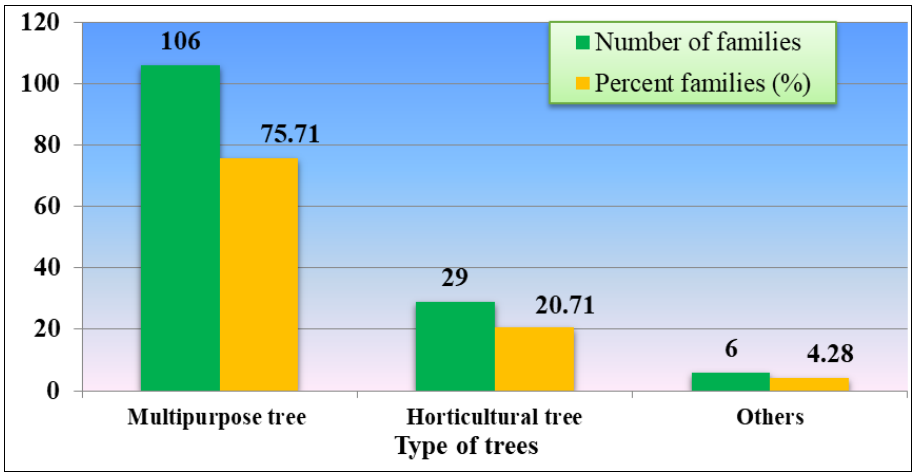

Fig 2: Different types of tree species preferred by farmer on wasteland

Table 3: Successful model for utilization of wastelands

S/No.	Successful non-traditional models	Profit/Bigha/cycle(Rs.)
1.	Pisciculture	44,503.78
2.	Poultry	46,400
3.	Bamboo plantation	270,000

Recommendation for farmers

1. Promotion of aquaculture and Olericulture,
2. Growing fodder tree species,
3. The wasteland owner motivated to change their attitude to utilized wasteland for generation of additional family income,
4. Promotion for growing horticulture trees and multipurpose trees on wasteland.

Conclusion

In conclusion, the study underscores the need for suitable strategies to reclaim and utilize wastelands in Nalanda district. It emphasizes the importance of raising awareness among the local populace, particularly regarding the advantages of government wasteland development programs. Moreover, there exists significant potential for wasteland development through integrated approaches encompassing forestry, agroforestry, aquaculture, and horticulture, thereby serving as a valuable resource for livelihood and employment generation while promoting environmental sustainability.

References

1. Department of Agriculture. Bihar's Agriculture Development: Opportunities & Challenges — A Report of the Special Task Force on Bihar. Government of India, New Delhi; c2008. p. 16.
2. Department of Agriculture. Bihar Agriculture at a

Glance. Agricultural Road Map (2012-2017). Government of Bihar; c2012. p. 1-2.
3. ICAR. Land Holding Pattern of Bihar, Agriculture Research Data Book. Indian Council of Agriculture Research, New Delhi; c2016.
4. ISRO. Wasteland – Bihar. Wasteland Atlas of India, Government of India; c2010. p. 52.
5. Puri S, Panwar P. Agroforestry System and Practices. New Delhi Publishing, New Delhi; c2007.
6. Newar S, Sharma N. A District-wise Analysis of Land Use Pattern and Land Use Changes in Rajasthan. Rajasthan Economic Journal, 92.
7. Goswami SN, Sen TK, Prasad J, Chatterji S. Effect of Climatic and Socio-Economic Factors on Under-Utilisation of Lands in Maharashtra. Agropedology. 2014;24(1):41-51.
8. Rawat DS, Joshi M, Sharma S, Rikhari HC, Palni LMS. Sustainable Development and Management of Rural Ecosystems in the Central Himalaya: A Case Study from Haigad Watershed. The International Journal of Sustainable Development & World Ecology. 1997;4(3):214-225.
9. Nayak S. Land Degradation in Uttar Pradesh: Causes, Extent, and Intensity. In: Jodha NS, Pushpam Kumar, Sudhakar Reddy (eds.), Ecology and Human Well-Being, Oxford Publications, Forthcoming Issue; c2006.