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Exploring the Physical and Mental Strain of Traditional Farming on Rural Women and the Impact on Youth's Declining Interest in Agriculture

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ABSTRACT

The study was conducted during May, 2021–April, 2022 at four randomly selected villages located in the radius of 5–7 km from Diphu town in the District of Karbi Anglong, Assam, India to study the physiological strain and discomfort experienced by rural women engaged in myriad activities such as load carrying, hoeing, weeding etc. and household weaving in Traditional farming practices in rural settings. A sample of 100 women was surveyed, and data were analyzed with Rating of Perceived Exertion (RPE) scale. Results showed significant discomfort in body parts such as the lower back, wrists, and legs. Additionally, psychosocial stress and mental health challenges related to the workload were identified, highlighting the hidden strain rural women face. The study suggested to use ergonomically designed farming tools and interventions to alleviate physical strain, as well as psychological support to mitigate stress. Further, the impact of these physical and mental stresses extends beyond the women themselves, discouraged younger generations from pursuing farming as a livelihood. This shift toward seeking alternative employment had worsened rural unemployment and exacerbated the challenges faced by agricultural communities which in turn provided hindrance in sustainable development. Studies of recent time had explored the link between labour intensity with mental health in rural women, indicating the necessity of recognizing the intersection of physical and mental health issues in rural work environments.

KEYWORDS: Traditional farming, physiological strain, ergonomic tools, rural women

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1. INTRODUCTION

Rural women play a vital role in traditional farming systems, often performing strenuous manual tasks under harsh conditions. These activities-such as bending, carrying heavy loads, hoeing, and weaving-are performed with little or no ergonomic support, leading to significant physical and psychological health issues (Singh et al., 2022; Das, 2023; Sinha et al., 2023; Panigrahi et al., 2025). The absence of proper tools and posture-friendly methods contributes to musculoskeletal disorders, fatigue, and long-term discomfort.

Compounding this, limited access to institutional support, lack of decision-making power, and restricted livelihood opportunities exacerbate the vulnerability and disempowerment of hill women farmers (Mukherjee et al., 2020).

Traditional farming involves repetitive activities such as load carrying, hoeing, and harvesting, which cause both acute and chronic physical strain. This physical burden often intersects with mental stress, forming a cycle of fatigue, anxiety, and emotional distress (Singh et al., 2022; Roy et al., 2024). Recent research calls for ergonomic and psychosocial interventions, highlighting a clear link between labour intensity and poor health outcomes in rural women (Kumar et al., 2022; Pal et al., 2017; Ubbla et al, 2023; Sinha et al., 2023). Understanding this relationship is essential for formulating strategies to improve their working conditions (Joshi et al., 2020). In addition to fieldwork, many women weave clothing at home, adding to their physical workload. Perceptions of low profitability, poor social status, and physically demanding conditions lead many rural youths to view farming as unappealing and unsustainable (Sreelakshmi et al., 2024). The declining interest in agriculture among youth is influenced by their observation of older women's physical suffering, financial insecurity, and low social status within the sector (Das, 2025; Anonymous, 2017a; Singh et al., 2022; Pandey and Rai, 2024). Several studies (Chatterjee and Acharya, 2020; Shivakumar et al., 2023) further establish that such conditions contribute significantly to rural women's emotional distress. Tools like the Rating of Perceived Exertion (RPE) and Rapid Entire Body Assessment (REBA) have been validated to assess ergonomic strain in both clinical and field settings (Varghese et al., 1994; Corlett and Bishop, 1976). These tools help quantify the intensity of physical discomfort linked with specific tasks and postures, making them useful for evaluating traditional farm work. Psychosocial research also reveals that youth develop their perceptions of agriculture through the lived experiences of their families. When they witness their mothers performing physically intense work with little reward or dignity, it reinforces their desire to seek employment outside farming (Das, 2025; Venkatesan et al., 2019; Anonymous, 2017c). Mohanty et al. (2025) affirm that poor agricultural working conditions directly contribute to youth migration. Chinchmalatpure and Tekale (2021) also highlight that negative perceptions of agriculture, due to low returns and social undervaluation, further push rural youth away from farm-based livelihoods.

Despite the intensity of these issues, few studies in Northeast India-especially tribal-dominated regions like Karbi Anglong-have explored the combined impact of women's ergonomic stress and its influence on youth disengagement. This study addresses that gap by examining the physical, psychological, and social burdens of women's farm labour and its broader consequences on the rural workforce and youth interest in agriculture (Das, 2022). The study was undertaken with the objectives-a. To assess the physical and psychological strain faced by rural women in traditional farming. b. To examine the mental health impacts of labour-intensive agricultural tasks. c. To explore how women's work-related burdens influence youth migration and declining interest in agriculture.

2. MATERIALS AND METHODS

The study was conducted during May, 2021–April, 2022 at four randomly selected villages located in the radius of 5–7 km from Diphu town in the District of Karbi Anglong, Assam (latitude-25.83° N, longitude -93.43° E and average altitude-186 m (610 ft)$^{-1}$). These areas were predominantly inhabited by tribal communities engaged in traditional farming practices. The sample size considered in the study was 100 Karbi tribal women. The primary objective was to assess the physical discomfort and perceived exertion experienced during various agricultural tasks undertaken by them regularly. Data collection focused on two main areas: perceived exertion levels and body discomfort associated with specific farming activities.

2.1. Survey tools

The Rating of Perceived Exertion (RPE) scale was used to measure perceived exertion, which ranges from 1 (very light) to 5 (very heavy). Participants rated their exertion for specific tasks, including bending, picking vegetables, hoeing, weeding, carrying baskets, and weaving. The REBA (Rapid Entire Body Assessment) Postural Analysis Tool was employed to evaluate ergonomic risks related to postures, body movements, and repetitive tasks to assess the risk levels of various activities. Each of the body parts which were predominantly used in the activity such as: wrists, forearms, elbows, shoulders, neck, trunk, back, legs, and knees, REBA scores were assigned and assessed using REBA Postural Analysis Tool. The method tables were then used to compile the risk factor variables generating a single score representing the risk level of MSD.

2.2. Collection of data

Data collected over a period of three months through structured interviews and surveys, conducted in the local language to ensure clarity and comfort for the participants who were from farming households. Demographic characteristics, such as age, weight, height, and family income, were also recorded. The youths of the households were also a part of the survey asking for opinions regarding their involvement in farming and if not the reasons thereof. Informed consent was obtained, and ethical considerations-such as confidentiality and voluntary participation-were strictly maintained.

2.3. Data analysis

Quantitative data from the Nordic Body Map, RPE and REBA tools were analyzed using statistical tests, including Chi-square tests and Correlation technique was done to examine relationships between demographic factors, levels of perceived discomfort and status of youths with regard to involvement in agriculture. The qualitative insights gained from interviews provided additional context on the participants' subjective experiences.

2.4. Limitations

The study's limitations included a sample size of small population and reliance on self-reported data, which might introduce biases, hence future studies should consider larger samples and objective measures of physical strain, such as wearable devices to track movement and posture.

3. RESULTS AND DISCUSSION

3.1. Demographic characteristics of respondents

In the present study, the demographic characteristics of the 100 female respondents were grouped as (Part-A) and (Part-B) and were represented in Table 1 and Figure 1 separately for ease of understanding. The mean age of the respondents was 54.96 years (range: 25–66 years) and an average of 24 years of farming experience. Participants reported working an average of 10.36 hrs day^{-1} (range: 7–13 hrs), highlighting the extensive daily physical labour that characterizes their work routines. This long history and extended working hours were likely to have contributed

Table 1: Demographic characteristic (Part-A) of the respondents (N=100)

Variable	Mean	SD	Range
Age (year)	54.96	12.22	<25->66
Hours of work day^{-1}	10.36	1.48	7–13
Working since Years	24.12	8.46	9–45
Weight (kg)	47.36	4.01	42–56
Height (cm)	150.92	8.15	145–156

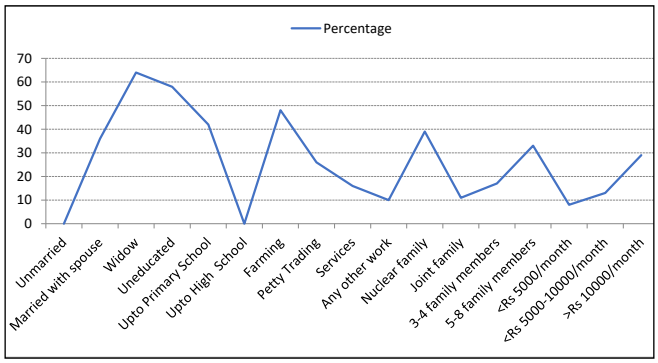


Figure 1: Some demographic characteristic (Part-B) of the respondents (N=100)

to the observed physical strain. It was revealed in Figure 1 that most of the families were nuclear with 5–8 members. Regarding income, majority (58 percent) of the families were having a earning of more than ₹ 10,000 per month.

3.2. Perceived exertion and body discomfort in agricultural tasks

Assessment of body parts discomfort was using Nordic Body Map (Figure 2) revealed 'noticeable discomfort, was prominent in areas such as lower back, upper back, knees, right shoulder, ankles/feet with higher mean scores. Table 2 shows the perceived exertion and discomfort levels across various farming activities. Hoeing, with an average Rating of Perceived Exertion (RPE) score of 3.52, was reported as the most physically demanding task, closely followed by carrying loaded baskets (RPE score: 8). Weeding, which involved stooping postures, received a relatively lower score (2.96), suggesting it was somewhat less strenuous. The variation in perceived exertion aligned with differences in body posture, repetitive motion, and the physical force required for each activity. Tasks such as bending, picking vegetables, and carrying heavy loads were among the most demanding and eventually, likely to contribute to the cumulative discomfort. Gangopadhyay et al., (2005) asserted that, the static postures held for long cause's ergonomic stresses leading to severe musculoskeletal disorders especially low back pain.

The results highlighted the significant physical and mental health burdens faced by rural women engaged in traditional

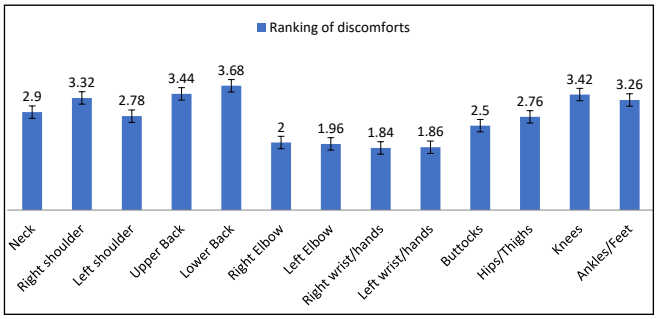


Figure 2: Ranking of body parts discomfort perceived by the respondents (N=100)

Table 2: Distribution of respondents according to perceived exertion in the selected activities (N=100)

Type of activity	Rating of perceived exertion	Frequency (f)	Percentage (%)	Total score	Mean RPE score	Rank
Bending and picking vegetables	Very light (1)	-	-	-		
	Light (2)	13	26.00	26		
	Moderately heavy (3)	22	44.00	66	3.04	IV
	Heavy (4)	15	30.00	60		
	Very heavy (5)	-	-	-		
Carrying loaded basket with head and back support and walking	Very light (1)	-	-	-		
	Light (2)	7	14.00	14		
	Moderately heavy (3)	21	42.00	63	3.30	III
	Heavy (4)	22	44.00	88		
	Very heavy (5)	-	-	-		
Standing and bending while hoeing	Very light (1)	-	-	-		
	Light (2)	5	1	10		
	Moderately heavy (3)	19	42.00	57	3.52	II
	Heavy (4)	21	38.00	84		
	Very heavy (5)	5	1	25		
Weeding with hand in stooping posture	Very light (1)	-	-			
	Light (2)	17	34.00	34		
	Moderately heavy (3)	18	36.00	54	2.96	V
	Heavy (4)	15	30.00	60		
	Very heavy (5)	-	-	-		
Sitting on floor while Weaving in loin looms	Very light (1)	-	-	-		
	Light (2)	3	6.00	6		
	Moderately heavy (3)	23	46.00	69	3.54	I
	Heavy (4)	18	36.00	72		
	Very heavy (5)	6	12.00	30		

farming practices. The high 'Rating of Perceived Exertion' (RPE) scores indicated that tasks like bending, hoeing, and carrying heavy loads impose considerable physical strain. These activities, which required sustained effort and awkward postures, exacerbate discomfort and increase the risk of long-term musculoskeletal disorders.

Table 3: Chi-Square value showing the relationship between body parts discomfort with 'age' and 'family income' of the respondents (N=100)

Dependent variable	Independent variable	Chi-square value (X^2)	Table value
Body parts discomfort	Age of the respondents	14.99*	12.59
	Monthly family income	14.98*	9.49

*Significant at p=0.05 level

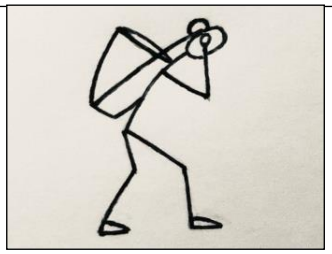
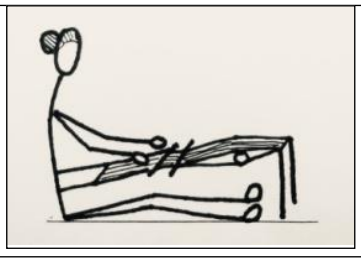
3.3. Chi-Square analysis of discomfort in relation to age and income

The chi-square analysis presented in Table 3 indicated a significant relationship between body discomfort and both age and family income. Older women reported heightened discomfort, especially in tasks involving bending and hoeing, likely due to the long-term physical toll of agricultural work. Women from lower-income households also reported greater discomfort, which might be due to limited access to ergonomic tools, healthcare, and other supportive resources that could alleviate physical strain.

3.4. Postural risks and REBA analysis

The REBA (Rapid Entire Body Assessment) analysis of postural risks is summarized in Table 4, showing high-risk scores for activities like bending to pick vegetables (REBA score: 11, very high risk) and carrying heavy baskets (REBA

Table 4: Analysis of work posture in performing selected activities through REBA postural analysis tool

Activity	Postures adopted	Body movements	REBA score
Bending for harvesting/picking vegetables		Trunk position=>60° flexion+1 Neck position=0°-20° flexion+1 Leg position=1+1 Upper arms=40°-90°+1 Lower arms=<60 flexion or >100° Wrists 0^0-15^0 flexion/extension	11
Carrying load in basket with head and back support		Trunk position=0°-20° flexion 0°-20° extension Neck position=0°-20° flexion+1 Leg position=1+1 Upper arms=>20° extension 20°-45° flexion+1 Lower arms=<60° flexion or >100^0 flexion Wrists 0°-15° flexion/extension+1	8
Hoeing		Trunk position=20°-60° flexion >20° extension Neck position=0°-20° flexion Leg position=1+1 Upper arms=>90° flexion+1 Lower arms=<60 flexion or >100^0 flexion Wrists >15° flexion/extension+1	9
Weeding		Trunk position=>60° flexion+10°-20° extension Neck position=0°-20° flexion+1 Leg position=1+2 Upper arms=>200 extension 20°-45° flexion+1 Lower arms=<60°-100° flexion Wrists 0°-15° flexion/extension+1	10
Weaving in loin looms		Trunk position=>600 flexion+1 Neck position=0°-20° flexion+1 Leg position=1 Upper arms=45°-90° flexion Lower arms=<60°-100° flexion Wrists 0°-15° flexion/extension+1	9

score: 8, high risk). These scores suggested that many of the farming tasks involved postures that pose a significant risk for musculoskeletal disorders (Table 5). The REBA results aligned with the findings of Das (2023), who highlighted that Indian farmers are frequently exposed to high ergonomic risks due to awkward postures, forceful exertions, and repetitive motions, potentially leading to long-term musculoskeletal disorders.

The REBA (Rapid Entire Body Assessment) analysis further emphasized the high postural risk associated with activities such as bending and lifting, which were common in traditional farming practices. Tasks involving repeated movements, poor posture, and heavy lifting contributed to the strain on the musculoskeletal system, underscoring the need for ergonomic interventions in rural agricultural settings.

3.5. Psychosocial stress and inferred mental health implications

Though, not directly measured, psychosocial stress was inferred from the respondents' reports of physical strain and long working hours. The cumulative fatigue from

Table 5: REBA scores in performing selected activities and their interpretation

Task	REBA score	Risk level	Action (Including further assessment)
Bending for harvesting/ picking vegetables from farm/jungle	11	Very high	Very high risk, implement change
Carrying load in basket with head and back suppor[t]	8	High	High risk, investigate and implement change
Hoeing	9	High	High risk, investigate and implement change
Weeding	10	High	High risk, investigate and implement change
Weaving in loin looms	9	High	High risk, investigate and implement change

labour-intensive tasks, combined with financial pressures and family obligations, likely contributed to significant stress and mental health challenges. This strain appeared particularly pronounced among older women and those with lower incomes, who face greater financial limitations in accessing ergonomic or labour-saving equipment, further intensifying both physical and mental stressors. While the primary focus of the study was the physical and mental strain on rural women, it was evident that these strains also had indirect effects on younger generations. As older women face the challenges of physical discomfort and psychosocial stress, there was a growing disinterest among rural youth in pursuing agriculture. This was particularly concerning as it led to a reduced agricultural workforce, contributing to the migration of youth to urban centers in search of better job opportunities (Sai et al., 2024; Anonymous, 2017a).

Beyond the physical strain, psychosocial stress emerged as a critical issue in this study. Rural women often endured mental health challenges resulting from the relentless nature of their labour, compounded by financial pressures, social isolation, and limited access to healthcare and mental health support. As observed, the physical discomfort resulting from the labour-intensive tasks was intertwined with emotional and psychological stress, creating a vicious cycle of physical and mental strain. These findings resonated with existing research that suggested that rural women bear a double burden of physical labour and mental stress, which significantly impacted their overall well-being (Ghosal et al., 2024; Arun and Prabhu, 2023). Additionally, the intersection of economic insecurity, social isolation, and healthcare access exacerbated the stress levels experienced by rural women. Research by Roy et al. (2024) also highlighted the psychosocial impacts of economic instability on women in rural agriculture, noting that these stressors were often overlooked in agricultural development policies.

To alleviate these burdens, this study recommended several key interventions. First, ergonomic interventions should be prioritized to reduce the physical strain associated with traditional farming. Labour-saving tools and posture correction training could be introduced to minimize musculoskeletal strain, particularly during repetitive and physically demanding tasks. Providing ergonomic tools such as better-designed hoes or baskets that reduced the need for prolonged bending could help reduce physical discomfort and prevent long-term health issues. Additionally, mental health support services were essential in helping rural women cope with the stressors associated with their work. Community-based mental health outreach programs, workshops on stress management, and access to counseling services could provide much-needed support. Das (2023) highlighted the pressing need for ergonomic interventions to reduce the physical strain among Indian farmers, emphasizing a systems-based approach to improve occupational health and prevent long-term musculoskeletal disorders.

Moreover, a need for policy-level interventions to address the structural barriers these women face, including inadequate access to healthcare, social security, and economic empowerment opportunities couldnot be denied. Programs aimed at improving economic independence, such as training in alternative livelihood skills or promoting access to credit facilities, could help reduce the financial stress that exacerbated mental health challenges. At present, Government facilities were reaching this section of population but, more efforts were required.

Thus, this study emphasized the importance of addressing the dual burden related to physical and psychosocial stress experienced by rural women engaged in traditional farming practices. By implementing ergonomic solutions, providing mental health support, and addressing broader economic and social inequities, significant improvement might be achieved in the well-being and productivity in rural agricultural settings.

3.6. Relationships of factors affecting youth declining interest in continuing agricultural work

The relationship between factors affecting youth declining interest in continuing agricultural work was analyzed using correlation coefficients as shown in Table 6. The result revealed strong, significant positive correlations between State of Despair and Insecurity in the House, Financial

Table 6: Relationships of factors affecting youth declining interest in continuing agricultural work

	Youth declining interest in agriculture	Age	Poor health of the parents	Financial constraints in the house	Unfriendly working system	State of despair and insecurity in the house
Youth declining interest in agriculture	1					
Age	0.0011	1				
Poor health of the parents	0.1230*	-0.0943	1			
Financial constraints in the house	0.1132*	-0.0081	-0.0743	1		
Unfriendly working system	0.1275*	-0.0950	0.1602	0.1106	1	
State of despair and insecurity in the house	0.5754**	-0.0045	0.0093	0.0461	-0.0271	1

*Significant at p=0.05 Level of significance; **Significant at p=0.01 level of significance

Constraints in the House, and Health Problems of the Parents. Unfriendly Working System and youth declining interest in Agriculture. State of Despair and Insecurity in the house provided disappointments to the youth. Financial Constraints in the house was another aspect that the youth see where his parents were always involved in work but financially were not secured. Additionally, Health Problems of the Parents due to over work, financial problem and lower health facilities influenced youths declining interest to stay in the village irrespective of their age. Unfriendly Working System also significantly correlated with Youth's declining interest in continuing agricultural work who also felt emotionally connected to agriculture but would like to have an advanced agricultural working system to enhance productivity and income.

The findings of this study reflected the broader socio-economic shift within rural communities. As the physical and mental burdens of traditional farming intensify, the younger generation became increasingly reluctant to engage in farming activities. This trend was contributing to the depopulation of rural areas, with many young people leaving for cities, leading to a serious labour shortage in agriculture and exacerbating rural unemployment (Das,2025; Anonymous, 2017c). Addressing these issues through health-oriented farming practices could mitigate these negative trends and help retain youth in agriculture."

4. CONCLUSION

This study found that rural women in traditional farming experienced significant physical strain from high-risk tasks such as carrying heavy loads, prolonged bending, and repetitive motions –leading to musculoskeletal disorders and inferred psychological stress. Discomfort was highest among older and low-income women. These burdens negatively influenced youth, who perceived farming as physically harsh and economically insecure.

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