P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating (2025): 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; SP-Issue 12; December 2025; Page No. 11-21

Received: 21-09-2025
Accepted: 23-10-2025

Indexed Journal
Peer Reviewed Journal

Perceived constraints & its association with livelihood empowerment of rural stakeholders in Nadia district of West Bengal under farmers first project of ICAR, India

[1]Sukanta Biswas, [2]A Goswami, [3]NK Tudu, [4]K Murmu, [5]BCKVI Kar, [6]A Mukherjee, [7]A Debnath, [8]S Das ADR, [9]SK Sau and [10]Biswajit Pal WBSU

[1-3]Professor, Department of Veterinary & Animal Husbandry Extension Education, W.B. University of Animal & Fishery Sciences, Kolkata, West Bengal, India
[4-10]Assistant Professor Department of Veterinary & Animal Husbandry Extension Education, W.B. University of Animal & Fishery Sciences, Kolkata, West Bengal, India

DOI: https://doi.org/10.33545/26180723.2025.v8.i12Sa.2737

Corresponding Author: Sukanta Biswas

Abstract

The present study entitled "Perceived Constraints and its association with Livelihood Empowerment of Rural Stakeholders in Nadia District of West Bengal" was conducted under the Farmer FIRST Project of ICAR, Ministry of Agril. & FW, Govt. of India, by the Dept. of Veterinary and A.H. Extension Education, WBUAFS, Kolkata. The investigation aimed to assess the livelihood empowerment status and identify the perceived constraints affecting farming communities in three adopted villages i.e. Ayeshpur, Baksha, and Dakshin Duttaparaunder Haringhata Block of Nadia District, West Bengal. A comprehensive baseline field survey was carried out during March 2025, covering 1001 respondents engaged in livestock-poultry, horticulture and fishery-based livelihood enterprises in the functional area. Data were collected through a structured interview schedule, encompassing socio-economic attributes, livelihood capitals, empowerment indicators and perceived constraints across production, resource, market, institutional and infrastructural dimensions. Analytical tools such as-descriptive statistics and chi-square test were employed to examine the interrelationship between perceived constraints and livelihood empowerment indices. The findings revealed that economic and infrastructural barriers, limited institutional support and market access constraints significantly influenced the degree of livelihood empowerment among rural stakeholders. The study emphasizes the need for capacity-building interventions, technological backstopping and inclusive policy measures to strengthen the livelihood capital base and ensure sustainable empowerment of farming communities in the region.

Keywords: Constraints, livelihood, empowerment, stakeholders, perceived etc.

Introduction

Sustainable Agri-Animal Husbandry based livelihoods are crucial for strengthening the rural economy particularly among small and marginal farmers who depend on animal husbandry for income, nutrition and employment security in India. However, the extent of livelihood empowerment is significantly influenced by multiple constraints related to resources, knowledge, infrastructure, markets and institutional support. The concept of livelihood capitals i.e. human, social, physical, financial and natural provides a comprehensive framework to understand how these factors shape the sustainability of rural livelihoods. Identifying constraints perceived and assessing their association with livelihood capitals is essential for formulating effective extension strategies, which can enhance empowerment and resilience among farming communities. In this context, the Indian Council of Agricultural Research (ICAR), Ministry of Agriculture & Farmers' Welfare, Govt. of India, initiated the Farmers FIRST project to promote need-based, participatory and field-oriented interventions. The present study was undertaken in three adopted villages i.e. Ayeshpur, Baksha, and Dakshin Duttapara of Haringhata Block in Nadia district, West Bengal, through a baseline survey conducted by the Dept. of Veterinary and A.H. Extension Education, Faculty of Veterinary and Animal Sciences, WBUAFS, Kolkata. The study aims to analyse the constraints perceived by rural stakeholders and examine their association with livelihood capitals in relation to sustainable empowerment, thereby generating insights for strengthening livestock extension and rural development initiatives in the functional area.

Materials and Methods

The present study was undertaken to assess the perceived constraints of rural stakeholders and examine their association with livelihood capitals in relation to livelihood empowerment under the Farmers FIRST project of ICAR, New Delhi by the Dept. of VAHEE, F/O-VAS, WBUAFS, Kolkata. A baseline survey was conducted in three adopted villages Ayeshpur (n=422), Baksha (n=319) and Dakshin Duttapara (n=260) of Haringhata Block in Nadia district, West Bengal, covering a total of 1001 respondents. Purposive sampling was employed to select households actively engaged in animal husbandry, Fishery, Horticulture

and allied activities. A structured, pre-tested interview schedule was administered through personal interviews to collect primary data on socio-economic characteristics, livelihood capitals and perceived constraints affecting livestock-based livelihoods. The collected responses were coded, classified and systematically tabulated for analysis. Descriptive and inferential statistical tools such as- frequency and percentage were used to summarize the profile of respondents and the distribution of identified constraints. To explore the relationship between perceived constraints and livelihood capitals chi-square test was used to determine the level of association between selected categorical variables. The results were interpreted to draw empirical insights on how constraints influence the sustainable empowerment of rural households. The findings provide a basis for strengthening livestock extension strategies and developing need-based interventions for rural livelihood improvement in the region.

Results and Discussion

The analysis of perceived constraints(Table-1) along with its ranking in relation to rural livelihood activities through Animal Husbandry, Fishery, Horticulture, Natural Resource Management (NRM), Integrated Farming Systems (IFS), and other non-conventional enterprises are analysed in terms of frequency-percentage distribution and depicted as follows:

Constraints in livestock, poultry& fishery systems

The findings reveal that disease epidemics ranked as the most critical constraint, affecting 70.6% of respondents, demonstrating the persistent vulnerability of animal-based livelihoods to health shocks. Lack of awareness and inadequate Human Resource Development (HRD) support was reported by 68.9% of respondents, indicating limited access to training and extension. A similarly high proportion (67.4%) identified poor availability of quality breeds, fish seeds, feeds, and inputs as a major constraint, reflecting significant input and supply-chain weaknesses. In addition, lack of organized marketing (66.5%) and non-availability of expert guidance (64.5%) further weakened producers' market participation and decision-making capacity. Although issues such as high input cost (31.4%), lack of credit access (32.9%), and localized constraints like poaching or seasonal water scarcity (15.6%) were relatively less frequent, they still represent substantial barriers for resource-poor households. These observations align with earlier studies by Chauhan *et al*. (2015) [5], Kumar *et al*. (2021) [11], and Rao & Natchimuthu (2020) [16], who similarly highlighted disease prevalence, weak advisory services, and poor input quality as major bottlenecks in livestock and aquaculture development.

Constraints in horticulture & natural resource management (NRM)

The analysis of horticultural and NRM-related responses indicates that non-availability of credit facilities (68.5%) and lack of remunerative price due to middlemen (67.5%) were the two highest-ranked constraints, underscoring institutional and market failures that directly affect profitability. High input costs (66.0%) and poor transportation systems (62.4%) further limit the efficient production and timely marketing of perishable commodities. Although only 27.5% reported lack of quality seeds and fertilizers, and 30.4% identified pest and disease epidemics as constraints, these issues continue to impede yield stability and production efficiency. The perception of limited expert advice (28.3%) suggests relatively better technical outreach in horticulture compared to livestock; however, advisory services remain insufficient. These trends corroborate findings by Singh, Singh, and Bhandari & Kumar (2021) [11], who documented persistent infrastructural gaps, market asymmetry, and inadequate institutional finance as key constraints affecting horticultural livelihoods in smallholder systems.

Constraints in integrated farming system(ifs) & NCF livelihoods

The IFS and non-conventional enterprises exhibited the highest proportion of respondents reporting lack of awareness and poor HRD support (82.7%-82.8%), implying that knowledge and skills for diversified enterprise management are inadequate. Lack of quality inputs and raw materials (71.8%-71.9%) and the non-availability of credit (67.6%) were also top-ranked issues, emphasizing economic barriers to adopting integrated and innovative systems. Poor transportation facilities (67.7%-67.8%) and limited expert advisory support (66.1%) highlight systemic deficiencies in multi-sector extension. Although only 23.9% perceived disease epidemics as a constraint, risks remain significant for livestock-linked components within IFS. Market-related issues such as lack of remunerative price (28.1%) and absence of organized marketing systems (21.1%) continue to restrict the commercialization potential of diversified IFS outputs. These findings resonate with the evidence provided by Mandal *et al*. (2017) [13] and Kumar & Singh (2019) [10], who observed that capacity building, market infrastructure, and quality input availability are foundational requirements for IFS success.

A comparative assessment reveals clear sectorial differentiation in the nature and severity of constraints. Disease incidence is predominantly severe in livestock and fishery systems, whereas credit shortages and high input costs dominate horticulture and IFS. Market-related constraints, such as- absence of organized marketing systems and non-remunerative pricing- appear consistently across all livelihood sectors, reflecting pervasive structural bottlenecks in rural markets. Similarly, lack of expert guidance and weak HRD support emerges as a common constraint, indicating systemic deficiencies in extension services and institutional support frameworks.

Overall, the integrated statistical insights emphasize the need for a multi-dimensional intervention strategy focusing on (i) reliable quality input supply systems, (ii) strengthened veterinary, fishery, and agricultural extension services, (iii) improved transportation and rural infrastructure, (iv) enhanced institutional credit mechanisms, and (v) efficient market and value-chain linkages. Addressing these cross-cutting constraints is essential for building resilient, sustainable and economically viable livelihood systems among rural households.

Table 1: Perceived Constraints along with ranking in relation to AH, Fishery, Horticulture, NRM, IFS &other NCF livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India (n=1001)

	Rank Constraints related to Livestock-Poultry & Fish Farming				Rank Constraints related to Horticulture & NRM				Rank Constraint related to IFS & other convent. farming			
	Constraints	Freq.	%	Rank	Constraint	Freq.	%	Rank	Constraint	Freq	%	Rank
1	Epidemics of disease of Livestock, Poultry & Fish	707	70.6	1	Non availability of credit facility	686	68.5	1	Lack of awareness as poor HRD facility	828	82.7	1
2	Lack of awareness as poor HRD facility	690	68.9	2	Lack of remunerative price of produce due to middleman	676	67.5	2	Lack of quality Inputs & Raw materials	719	71.8	2
3	Lack of Quality breeds, fish seeds, feeds & inputs	675	67.4	3	High cost of agricultural Inputs	661	66.0	3	Poor transportation system	678	67.7	3
4	Lack of organized Marketing System	666	66.5	4	Poor transportation system	625	62.4	4	Non availability of credit facility	676	67.5	4
5	Non availability of Expert advice	646	64.5	5	Lack of awareness as poor HRD facility	313	31.3	5	Non availabilty of expert advice	661	66.0	5
6	Non availability of credit facility	329	32.9	6	Epidemics of pests &disease in crops	304	30.4	6	High cost of Inputs	595	59.4	6
7	High cost of Livestock-Poultry & Fishery Inputs	314	31.4	7	Non availability of expert advice	283	28.3	7	Lack of remunerative price of produce	281	28.1	7
8	Poor Transportation System	300	30.0	8	Lack of quality Seed, fertilizr input	275	27.5	8	Epidemics of infectious disease	239	23.9	8
9	Lack of remunerative price due to Middleman	254	25.4	9	Lack of organized marketing system	262	26.2	9	Lack of organized marketing system	211	21.1	9
10	Problems of poaching fishes & water during summer	156	15.6	10								

The Chi-square test between selected Socio-economic (Age) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-02): The Chi-square analysis between the age groups of respondents and their perceived constraint levels across different livelihood domains revealed notable variations in perception patterns. Although the constraint levels across Livestock, Poultry, and Fish Farming (p=1.235; p=0.539) and Horticulture & Natural Resource Management (NRM) (p=2.834; p=0.242) showed no significant association with age, a significant relationship was observed in the case of Integrated Farming System (IFS) and other conventional farming (p = 7.349; p = 0.025*) and overall farm livelihood practices (p = 6.288; p = 0.043*).

This indicates that age plays a significant role in determining how respondents perceive livelihood constraints in diversified and integrated systems. The elderly group (51-75 years) exhibited relatively higher mean constraint scores (5.04 and 13.88, respectively), possibly due to their limited physical capacity, adaptability to new technologies, and greater dependency on traditional methods. In contrast, middle-aged farmers (26-50 years) reported slightly lower overall constraints (13.66), suggesting a balanced adaptation to both traditional and modern practices, aided by experience and resource control. The findings suggest that experience and age influence the ability to cope with or perceive production and livelihood-related constraints, particularly in complex integrated systems that demand knowledge, skill, and labour coordination. Similar observations were made by Chauhan *et al*. (2015) [5], who reported that older farmers often face higher adaptation barriers to diversified farming practices, and Mandal *et al*. (2017) [13], who highlighted the role of age and experience in determining the efficiency and constraint perception in integrated livelihood systems.

Table 2: Chi-square test between selected Socio-economic (Age) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Age wise livelihood based perceived constraint level				
Age	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood Practices**
Young (< 25 yr)	4.68	4.05	4.45	13.18
Middle (26-50 yr)	4.74	4.07	4.85	13.66
Elderly (51-75 yrs.)	4.71	4.13	5.04	13.88
Test Statistics[a,b]				
Chi-Square	1.235	2.834	7.349	6.288
df	2	2	2	2
Asymp. Sig.	.539	.242	.025*	.043*

The statistical analysis (Chi-square/MWU test) of gender-wise perceived constraints in relation to Animal Husbandry (AH) and allied livelihood practices among respondents (Table-03): The statistical analysis using the Mann Whitney U test revealed interesting gender-based variations in the perception of livelihood-related constraints across different farm sectors. Although there were no significant differences between male and female respondents regarding constraints in Livestock, Poultry, and Fish Farming(p=0.282), IFS & other conventional farming(p=0.161), and overall farm livelihood practices (p=0.121), a significant difference(p=0.018*) was found in Horticulture and Natural Resource Management (NRM) related constraints.

This indicates that gender has a significant influence on the perception of problems in horticultural and resource-based enterprises. Female respondents (mean score 3.99) perceived slightly lower constraints compared to males (mean score 4.10), possibly reflecting their relatively lesser involvement in large-scale horticultural operations but greater participation in home-based or small garden cultivation where management is more flexible. In contrast, male farmers, who are often more engaged in commercial or market-linked horticulture and irrigation management, experienced higher constraints related to input cost, credit access, and infrastructure. Overall, while gender differences were not statistically significant in most sectors, the results highlight the differentiated livelihood challenges shaped by gender roles and responsibilities in rural farming systems. The findings are in line with Kaur and Singh (2017) and Mandal *et al.* (2017) [13], who reported that gender disparities in access to resources, decision-making power, and institutional support often influence the degree and nature of perceived livelihood constraints among rural households.

Table 3: Chi-square test between selected Socio-economic (Gender) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Gender wise livelihood based perceived constraint level				
Gender	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraints on farm livelihood Practices**
Male	4.73	4.10	4.91	13.73
Female	4.76	3.99	4.74	13.49
Test Statistics[a]				
Man-Whitny U	63562.000	60091.500	61883.000	61429.500
Wilcoxon W	420152.00	72494.500	74286.000	73832.500
Z	-1.076	-2.368	-1.402	-1.549
Asymp. Sig. (2-tailed)	.282	.018*	.161	.121

Chi-square test between selected Socio-economic (Religion) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table -04)

The Chi-square test revealed a significant association between religion and perceived constraint levels across all major livelihood sectors except with minor variation in strength of association. The results indicated that religion had a statistically significant influence on constraints in Livestock, Poultry, and Fish Farming (p = 41.906; p = 0.000**), Horticulture & Natural Resource Management (NRM) (p = 11.120; p=0.011*), IFS and other conventional farming (p=72.972; p=0.000**), and overall farm livelihood practices (p70.086; p=0.000**).

Among the different religious groups, Hindu respondents recorded the highest overall constraint mean (13.85), followed by those belonging to Christian (13.20), Other (13.18), and Muslim (12.80) communities. This variation suggests that the degree of livelihood challenges may be shaped by religious and socio-cultural contexts, influencing resource ownership, community participation, and access to institutional support systems. Hindu respondents, who constitute the majority, may be more engaged in multiple livelihood components such as livestock, horticulture, and IFS, thereby facing a wider range of operational challenges. Conversely, Muslim respondents reported comparatively lower constraints, possibly due to more homogenous occupational engagement or smaller-scale operations with limited diversification. The observed pattern implies that religio cultural diversity influences perceptions and experiences of production constraints within mixed farming communities. Similar findings were reported by Rao and Natchimuthu (2020) [16] and Biswas *et al*. (2018) [2], who highlighted that religion-based occupational patterns, social networks and community access to extension services significantly affect farmers' constraint perception and livelihood outcomes in rural Bengal.

Table 4: Chi-square test between selected Socio-economic (Religion) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India.

Religion wise livelihood based perceived constraint level				
Religion	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraint on farm livelihood Practices**
Hinduism	4.77	4.06	5.01	13.85
Muslim	4.49	4.17	4.15	12.80
Christian	4.80	4.60	3.80	13.20
Others	4.64	4.00	4.55	13.18
Test Statistics[a,b]				
Chi-Square	41.906	11.120	72.972	70.086
df	3	3	3	3
Asymp. Sig.	**.000****	**.011***	**.000****	**.000****

Chi-square test between selected Socio-economic (Marital status) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-05): The Chi-square analysis revealed a highly significant association between marital status and perceived constraints across all livelihood sectors examined.

The test results indicated strong significance in Livestock, Poultry, and Fish Farming (χ^2 = 71.653; p = 0.000**), Horticulture & Natural Resource Management (NRM) (χ^2 = 29.239; p = 0.000**), IFS and other conventional farming (χ^2 = 134.902; p = 0.000**), and overall farm livelihood practices (χ^2 = 115.188; p = 0.000**).

Among the respondents, married farmers showed the highest overall perceived constraint mean score (13.97), followed closely by widowers (14.33), while unmarried and divorced individuals reflected lower constraint scores (12.85 and 12.69, respectively). This indicates that marital status significantly influences livelihood perception, possibly due to differing household responsibilities, resource control, and livelihood engagement intensity. Married respondents, often being primary earners with dependents, are more deeply involved in production and marketing activities, making them more exposed to livelihood constraints such as input scarcity, financial limitations, and disease incidence. Widowers also experienced high constraint levels, potentially reflecting the absence of household support in managing multifaceted farm operations. The findings suggest that family composition and marital status play an important socio-economic role in shaping the perception and severity of livelihood constraints in rural settings. Similar observations were reported by Kumar & Singh (2019) [10] and Biswas *et al.* (2018) [2], who emphasized that married individuals, being more economically active and burdened with family responsibilities, perceive higher livelihood challenges due to greater exposure and accountability within household farming systems.

Table 5: Chi-square test between selected Socio-economic (Marital status) attributes and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Marital status wise livelihood based perceived constraint level				
Marital Status	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraints on farm livelihood Practices**
Married	4.80	4.04	5.13	13.97
Unmarried	4.50	4.26	4.08	12.85
Divorced	4.48	4.21	4.00	12.69
Widow	4.68	3.98	4.61	13.27
Widower	4.67	4.00	5.67	14.33
Test Statistics[a,b]				
Chi-Square	71.653	29.239	134.902	115.188
df	4	4	4	4
Asymp. Sig.	.000**	.000**	.000**	.000**

Chi-square test between selected livelihood capital (Occupation) features and perceived Constraints in relation to AH & allied livelihood practices by respondents (Table-06)

The Chi-square test results revealed a highly significant association between occupational categories and perceived constraint levels across all livelihood sectors studied. The association was significant for Livestock, Poultry & Fish Farming (p=0.000**), Horticulture & Natural Resource Management (NRM) (p=0.000**), IFS & other conventional farming (p=0.000**), and overall farm livelihood practices (p = 0.000**). The analysis shows that unemployed respondents perceived the highest overall constraint score (15.00), followed by skilled/unskilled labourers (14.64), service holders (14.50), and businesspersons (14.23). These groups likely experience higher livelihood constraints due to unstable income sources, limited access to productive assets, and dependence on external resources for livelihood diversification. In contrast, farmers and agricultural labourers reported comparatively lower constraint scores (12.93 and 12.81, respectively), possibly reflecting their greater familiarity, experience, and adaptability to local farming systems and resource networks.

The findings indicate that occupation significantly influences the degree of perceived livelihood constraints, particularly in diversified or integrated farming systems where economic capacity, access to inputs, and technical knowledge vary widely among occupational groups. Those directly engaged in farming activities tend to have more coping mechanisms and institutional linkages, whereas non-farming groups face greater challenges in adopting or sustaining animal husbandry and allied enterprises. These results align with earlier studies by Mandal *et al.* (2017) [13] and Kumar & Singh (2019) [10], who reported that occupational status strongly affects access to livelihood capitals such as physical assets, financial resources, and extension services, thereby shaping the intensity of perceived constraints among rural households in Eastern India.

Table 6: Chi-square test between selected livelihood capital (Occupation) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Occupation wise livelihood based perceived constraint level				
Occupation	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraints on farm livelihood Practices**
Farmer	4.55	4.20	4.18	12.93
Lives/Fish Owner	4.60	4.09	4.38	13.07
Agriculture Labour	4.52	4.11	4.18	12.81
Skill/Unskill labour	4.94	4.01	5.69	14.64
Service	5.00	4.00	5.50	14.50
Business	4.87	3.97	5.40	14.23

Self-Employed	4.75	4.08	4.17	13.00
Unemployed	5.00	4.00	6.00	15.00
Test Statistics[a,b]				
Chi-Square	158.391	27.282	393.801	369.433
df	7	7	7	7
Asymp. Sig.	.000**	.000**	.000**	.000**

Chi-square test between selected livelihood capital (Caste) features and perceived Constraints in relation to AH & allied livelihood practices by respondents (Table-07)

The Chi-square test results indicated a highly significant association between caste and perceived livelihood constraints across all major farming sectors. The association was statistically significant for Livestock, Poultry & Fish Farming (p = 0.000**), Horticulture& Natural Resource Management (NRM) (p = 0.000**), IFS and other conventional farming (p = 0.000**), and overall farm livelihood practices (p = 0.000**).Among caste groups, respondents from the General category reported the highest overall constraint score (14.69), followed by those from Scheduled Castes (SC) (12.97), Other Backward Classes (OBC) (12.68), and Scheduled Tribes (ST) (12.67). The comparatively higher constraint perception among general caste respondents may be attributed to their higher involvement in diversified and commercialized livelihood ventures such as- integrated farming systems and market-linked livestock production which expose them to a wider range of financial, managerial, and input-related challenges. Conversely, the lower constraint scores among SC, ST, and OBC groups might reflect their limited scale of operations and dependence on subsistence-level activities, though they may still face underlying socio-economic vulnerabilities.

The findings clearly establish that caste as a socio-economic determinant significantly influences livelihood challenges, access to resources, and exposure to risk in rural farming systems. Social stratification often affects farmers' access to institutional support, market linkages, and technical services, thereby shaping both the extent and perception of livelihood constraints. These results are consistent with earlier findings by Rao & Natchimuthu (2020) [16] and Biswas *et al*. (2018) [2], who observed that caste hierarchy plays a crucial role in determining access to livelihood capitals, extension participation, and resilience to constraints within mixed farming systems in rural West Bengal.

Table 7: Chi-square test between selected livelihood capital (Caste) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Caste **wise livelihood based perceived constraint level**				
Caste	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraints on farm livelihood Practices**
SC	4.58	4.13	4.26	12.97
ST	4.51	4.19	3.97	12.67
OBC	4.55	4.04	4.09	12.68
General	4.93	4.03	5.73	14.69
Test Statistics[a,b]				
Chi-Square	160.524	19.411	506.582	477.563
df	3	3	3	3
Asymp. Sig.	.000**	.000**	.000**	.000**

Chi-square test between selected livelihood capital (Education) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-08)

The Chi-square analysis revealed a significant association between the education level of respondents and their perceived constraints across all major livelihood domains. The relationships were statistically significant for Livestock, Poultry & Fish Farming (χ^2 = 110.391; p = 0.000**), Horticulture & Natural Resource Management (χ^2 = 15.215; p = 0.019*), Integrated Farming System (IFS) & Conventional Farming (χ^2 = 311.622; p = 0.000**), and overall livelihood constraints (χ^2 = 299.575; p = 0.000**).The data showed that illiterate respondents experienced the highest overall constraint score (14.78), followed by those with middle (13.98) and primary (13.78) education levels, while respondents with high school (12.80) and graduate & above (13.30) education perceived relatively fewer constraints. This pattern indicates that education plays a pivotal role in reducing perceived livelihood barriers, as educated individuals tend to have better access to technical knowledge, extension services and adaptive skills that help them cope more effectively with production, input and market-related challenges.

Conversely, illiterate and less-educated respondents face multiple challenges in understanding scientific management practices, adopting innovations, and availing institutional benefits, which often results in a higher perception of livelihood constraints. Education thus acts as a crucial form of human capital, enhancing decision-making ability, awareness of government schemes, and risk management capacities among rural farmers.These findings are in agreement with the studies of Kumar *et al*. (2020) [12] and Islam & Nath (2017) [7], who also highlighted that education level significantly influences farmers' ability to overcome livelihood constraints through informed participation in livestock and allied agricultural enterprises.

Table 8: Chi-square test between selected livelihood capital (Education) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Effect of education level on livelihood based perceived constraint level				
Education of the respondent	**Constraint on Livestock Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Overall Constraints on farm livelihood Practices**
Illiterate	4.93	4.05	5.80	14.78
Can read only	4.55	4.15	4.16	12.86
Can read & write	4.59	4.07	4.33	13.00
Primary	4.82	4.05	4.91	13.78
Middle	4.77	4.08	5.13	13.98
High School	4.20	4.40	4.20	12.80
Graduate& above	4.60	3.70	5.00	13.30
Test Statistics[a,b]				
Chi-Square	110.391	15.215	311.622	299.575
df	6	6	6	6
Asymp. Sig.	.000**	.019*	.000**	.000**

Chi-square test in selected livelihood capital (Family Type) features and perceived Constraints in relation to AH & allied livelihood practices by respondents (Table-09)

The Mann-Whitney U test results indicated a significant association between family type and perceived constraints in most of the livelihood domains, particularly in Livestock-Poultry-Fish Farming (p = 0.000**), IFS & Conventional Farming (p = 0.000**), and Overall Farm Livelihood (p = 0.000**). However, no significant difference was observed in the case of Horticulture & Natural Resource Management (p = 0.516). Respondents from nuclear families recorded higher mean constraint scores across most livelihood components (overall = 14.00) compared to those from joint families (overall = 12.78). This suggests that members of nuclear families, being smaller in size, often face labour shortages, limited resource-sharing capacity, and higher workload per capita, leading to a greater perception of livelihood constraints. In contrast, joint families benefit from collective labour, shared income sources, and mutual support, which help in distributing risks and responsibilities more effectively across farming operations.

The findings imply that social capital and cooperative family structures play a vital role in minimizing livelihood constraints by pooling labour, skills, and decision-making capabilities. Similar observations were made by Sharma *et al*. (2019), who noted that joint family systems enable better resource utilization and resilience in agricultural activities. Additionally, Kumar & Singh (2021) [11] emphasized that family cohesion and collective participation in livestock rearing enhance productivity and sustainability of rural livelihoods.

Table 9: Chi-square test between selected livelihood capital (Family Type) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Effect of family typeon livelihood based perceived constraint level				
Family Type	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
Nuclear	4.79	4.08	5.13	14.00
Joint	4.55	4.09	4.14	12.78
Test Statistics[a]				
Mann-Whitny U	73701.000	91862.500	48335.000	47128.000
Wilcoxon W	105076.00	374238.50	79710.000	78503.000
Z	-6.773	-.650	-12.275	-12.610
Asymp. Sig. (2-tailed)	.000**	.516	.000**	.000**

Chi-square test between selected livelihood capital (Family Size) features and perceived Constraints in relation to AH & allied livelihood practices by respondents (Table-10)

The Chi-square test analysis revealed a significant association between family size and perceived livelihood constraints in most livelihood domains, particularly for Livestock-Poultry-Fish Farming (p = 0.000**), IFS & Conventional Farming (p = 0.000**), and Overall Farm Livelihood Practices (p = 0.000**). However, the relationship between family size and constraints in Horticulture & Natural Resource Management was not statistically significant (p = 0.263). Respondents belonging to small families (<5 members) perceived relatively higher levels of constraints (overall mean = 14.00) compared to those from medium (6-7) or large (>7) families. This pattern indicates that smaller families often face labour shortages, limited income diversification, and reduced access to social and economic support systems, which collectively heighten their perception of livelihood constraints. Conversely, larger families, with greater human resources, tend to share labour and responsibilities, thereby lowering operational constraints in animal husbandry and allied activities.

These findings highlight the role of family labour and intra-household cooperation as crucial determinants of livelihood sustainability. Larger families often achieve better work distribution and risk management across farming enterprises, as also noted by Das and Deka (2020) [6], who found that family size significantly influences farm resilience and resource use efficiency. Similarly, Singh *et al*. (2018) [19] observed that extended family structures contribute positively to agricultural productivity and livelihood security in rural settings.

Table 10: Chi-square test between selected livelihood capital (Family Size) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District, W.B.

Effect of family size on livelihood based perceived constraint level				
Family Size	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
Small (<5)	4.80	4.07	5.14	14.00
Medium (6-7)	4.56	4.10	4.21	12.86
Large> 7)	4.58	4.15	4.18	12.92
Test Statistics[a,b]				
Chi-Square	50.990	2.670	140.341	143.261
df	2	2	2	2
Asymp. Sig.	.000**	.263	.000**	.000**

Chi-square test between selected livelihood capital (Land Holding) features and perceived Constraints in relation to AH & allied livelihood practices by respondents (Table-11)

The Chi-square test results revealed a significant association between landholding size and perceived livelihood constraints in most livelihood domains, namely Livestock-Poultry-Fish Farming (p = 0.000**), IFS & Conventional Farming (p = 0.000**), and Overall Farm Livelihood Practices (p = 0.000**). However, the association between landholding and Horticulture & Natural Resource Management was not statistically significant (p = 0.219). Respondents belonging to the marginal landholding category (mean = 14.05) perceived the highest level of constraints, followed by small landholders (mean = 13.72), whereas landless and medium farmers reported comparatively lower overall constraint levels (means = 12.48 and 12.46, respectively). The higher constraint perception among marginal and small landholders may stem from limited access to productive assets, credit facilities, and infrastructural support, which restricts diversification and scalability of farm-based livelihoods. Conversely, medium landholders often enjoy better resource base and economic stability, allowing them to mitigate livelihood challenges more effectively.

These findings align with earlier studies indicating that landholding size plays a pivotal role in determining livelihood resilience and adaptive capacity in rural settings. According to Sinha and Singh, smaller landholders often face structural constraints such as inadequate inputs, poor market access, and financial limitations that impede livelihood development. Similarly, Meena *et al*. (2019) [14] emphasized that land endowment significantly influences the sustainability and intensity of livestock-based livelihood activities in agrarian communities.

Table 11: Chi-square test between selected livelihood capital (Land Holding) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Land holding wise livelihood based perceived constraint level				
Land Holding	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
Landless	4.52	4.14	3.82	12.48
Marginal	4.82	4.07	5.16	14.05
Small	4.70	4.10	4.92	13.72
Semi-Medm	4.65	4.08	4.03	12.76
Medium	4.61	3.89	3.96	12.46
Test Statistics[a,b]				
Chi-Square	33.775	5.747	119.696	113.813
df	4	4	4	4
Asymp. Sig.	.000**	.219	.000**	.000**

Chi-square test between selected livelihood capital (Gross Family Income) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-12)

The statistical analysis revealed a highly significant association between gross family income and perceived livelihood constraints across all livelihood domains Livestock-Poultry-Fish Farming (p = 0.000**), Horticulture & Natural Resource Management (p = 0.000**), IFS & Conventional Farming (p = 0.000**), and Overall Farm Livelihood Practices (p = 0.000**). Respondents belonging to the lower-income group (< Rs. 2000/month) perceived relatively fewer constraints (mean = 12.66) compared to those in the moderate income group (Rs. 2001-5000/month) who reported markedly higher constraint levels (mean = 14.79). This inverse trend indicates that as income rises, exposure to diversified and modern livelihood practices increases, leading to the identification of more complex or systemic barriers such as high input costs, inadequate technical support, and market constraints. In contrast, extremely low-income households may remain confined to traditional subsistence activities, thereby perceiving fewer but more basic livelihood challenges. These findings are consistent with Kumar *et al*. (2021) [11], who observed that families with moderate income levels are often in transition towards improved livelihood systems but face financial, infrastructural, and institutional barriers. Similarly, Saha and Paul (2018) [17] highlighted that economic capacity influences the ability to access quality inputs, credit, and technical services, thereby affecting the perception and intensity of livelihood constraints.

Table 12: Chi-square test between selected livelihood capital (Gross Family Income) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B.

Effect of Gross family incomeon livelihood based perceived constraint level				
Gross Family Income	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
< Rs.2000/-	4.54	4.13	3.99	12.66
Rs.2001-5000	4.94	4.03	5.83	14.79
Test Statistics[a]				
Mann-Whitney U	79456.000	########	16941.500	20744.500
Wilcoxon W	211811.00	230915.50	149296.50	153099.50
Z	-13.289	-3.655	-25.263	-24.393
Asymp. Sig. (2-tailed)	**.000****	**.000****	**.000****	**.000****

Chi-square test between selected livelihood capital (Annual Income from various sources) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-13)

The statistical findings revealed a highly significant association between annual income sources and perceived livelihood constraints across all livelihood domains Livestock-Poultry-Fish Farming (p=0.000**), Horticulture & Natural Resource Management (p = 0.000**), IFS & Conventional Farming (p=0.000**), and Overall Farm Livelihood Practices (p=0.000**).Respondents whose major income derived from Animal Husbandry and Fishery activities perceived higher overall constraint levels (mean=14.77) compared to those primarily dependent on agriculture (mean=12.66). This difference may stem from the complexity and risk-prone nature of livestock and aquaculture systems, which often require quality inputs, disease management, and reliable market access. In contrast, crop-based farmers—though constrained by input cost and climatic variability tend to operate under relatively stable traditional frameworks with predictable cycles of production.

The higher constraint perception among AH-Fishery-based households also reflects their greater exposure to institutional inefficiencies, credit scarcity, and marketing limitations in these emerging livelihood sectors. Such findings are supported by Singh), who reported that livestock and fisheries entrepreneurs face multiple systemic barriers related to input supply and veterinary services. Similarly, Bordoloi and Das (2019) [3] noted that income diversification towards allied sectors, while promising higher returns, often increases vulnerability due to infrastructural and extension service gaps.

Table 13: Chi-square test between selected livelihood capital (Annual Income from various sources) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B., India

Effect of Annual income from various sourceson livelihood based perceived constraint level				
Annual Income 4m VS	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
Agriculture	4.48	4.18	4.00	12.66
AH-Fishery	4.99	3.98	5.80	14.77
Test Statistics[a]				
Mann-Whitney U	66279.00	101731.00	18769.00	21667.50
Wilcoxon W	196584.00	222517.00	149074.00	151972.50
Z	-17.131	-6.562	-24.843	-24.184
Asymp. Sig. (2-tailed)	.000**	.000**	.000**	.000**

Chi-square test between selected livelihood capital (Access of Physical facility) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents (Table-14)

The statistical analysis revealed a highly significant association between access to physical facilities and perceived livelihood constraints across all livelihood domains Livestock-Poultry-Fish Farming (p=0.000**), Horticulture & Natural Resource Management (p=0.000**), IFS & Conventional Farming (p=0.000**), and Overall Farm Livelihood Practices (p=0.000**).Respondents having access to physical facilities such as irrigation systems, storage units, livestock shelters, transportation, and farm equipment reported higher overall constraint levels (mean = 14.15) compared to those lacking such facilities (mean = 12.60). This apparently paradoxical finding indicates that farmers with better physical infrastructure are more aware and critical of existing operational gaps, including high input costs, irregular maintenance, poor market linkages, and technical inadequacies. In contrast, respondents without access often remain confined to traditional livelihood systems, perceiving fewer constraints due to lower exposure to technological and infrastructural challenges.

This result is consistent with the observations of Rao *et al*. (2020) [15], who reported that access to physical assets enhances livelihood opportunities but also increases dependence on institutional and market support systems, thereby exposing users to new forms of constraints. Similarly, Chakraborty and Saha (2018) [17] highlighted that rural households with improved infrastructure face multidimensional challenges related to management efficiency, maintenance, and service delivery, particularly in livestock and allied sectors.

Table 14: Chi-square test between selected livelihood capital (Access of Physical facility) features and perceived Constraints in relation to AH & allied livelihood practices by sample respondents in adopted villages (03) at Haringhata block, Nadia District of W.B.

Effect of access to physical asset on livelihood based perceived constraint level				
Access Phy facility	**Constraint on Lives-Poultry Fish Farming**	**Constraints on Horticulture & Natural Resource Mgmt.**	**Constraint on IFS & other conv. farming**	**Constraints on Overall farm livelihood**
No	4.28	4.33	4.00	12.60
Yes	4.92	3.98	5.25	14.15
Test Statistics[a]				
Mann-Whitny U	44116.500	71637.500	40737.500	40237.000
Wilcoxon W	87776.500	321208.50	84397.500	83897.000
Z	-19.132	-9.962	-16.225	-16.366
Asymp. Sig. (2-tailed)	.000**	.000**	.000**	.000**

The comprehensive statistical analysis of socio-economic and livelihood capital characteristics revealed that multiple factors-both demographic and economic significantly influence the level and nature of perceived constraints in relation to Animal Husbandry, Fishery, Horticulture, Natural Resource Management (NRM), Integrated Farming System (IFS), and other allied livelihood practices.

Among the socio-economic variables, age, religion, marital status, and gender exhibited varying degrees of association with perceived constraints. The Chi-square tests indicated that age was significantly related to constraints under IFS and overall farm livelihood practices ($p < 0.05$), suggesting that older and middle-aged respondents tend to experience more livelihood challenges, possibly due to greater engagement intensity and responsibility in farm management. Gender differences were significant for Horticulture & NRM-related constraints ($p < 0.05$), with female respondents reporting higher limitations, reflecting gender-specific disparities in access to productive resources and extension services. Similarly, religion and marital status were strongly associated ($p < 0.01$) with all livelihood domains, indicating that social-cultural background and family responsibilities substantially shape constraint perception and participation in rural livelihood systems. In terms of livelihood capitals, variables such as occupation, caste, education, family type, family size, landholding, and income levels showed statistically significant influences (mostly $p < 0.01$) across almost all domains of AH and allied sectors. Respondents belonging to marginal landholding and lower income groups perceived higher constraints, emphasizing the role of resource scarcity and limited asset ownership in shaping livelihood vulnerability. Notably, occupation and caste emerged as particularly critical determinants, where service holders, skilled labourers, and general caste respondents exhibited higher mean constraint scores—indicating their greater awareness of input, market, and institutional deficiencies.

Further, analysis of livelihood asset-related variables, including gross family income, annual income from various sources, and access to physical facilities, confirmed that economic endowment and infrastructural access significantly affect constraint perception. Interestingly, respondents with higher income or better physical facilities perceived greater constraints, possibly because they are more exposed to system inefficiencies, market volatility, and technological gaps that limit sustainable livelihood expansion. This pattern reflects a shift from basic survival concerns to systemic and institutional-level challenges among economically better-off households. Overall, the cumulative findings underscore that livelihood constraints are multidimensional, shaped jointly by personal, socio-cultural, economic, and infrastructural factors. The results reaffirm that socio-economic heterogeneity determines differential access to resources, exposure to risks, and participation in livelihood activities, thereby influencing how individuals and households perceive constraints in AH and allied sectors. These results are in consonance with previous studies such as Meena *et al*. (2019) [14] and Sinha & Singh, who emphasized that livelihood vulnerability in rural India is a complex outcome of intersecting socio-economic attributes, resource endowment, and institutional support levels. Strengthening livelihood capitals—particularly human, physical, and financial assets—through capacity building, resource access, and infrastructure improvement could substantially mitigate these perceived constraints and enhance the resilience of rural farming communities.

Conclusion

The study revealed that rural stakeholders engaged in diverse livelihood practices under the Farmers First Project in Nadia District face multifaceted constraints influencing their empowerment and sustainability. Disease epidemics in livestock and fishery, lack of awareness and HRD support, poor input quality, limited credit access, and inadequate market linkages emerged as dominant challenges across all sectors. Socio-economic and livelihood capitals such as education, family structure, landholding, income level, and access to physical assets significantly influenced the perceived constraint levels. The results emphasize that technical limitations, institutional bottlenecks, and infrastructural deficiencies collectively hinder effective livelihood performance and empowerment. Strengthening capacity-building initiatives, ensuring input and credit accessibility, improving market organization, and enhancing extension outreach are vital for reducing these constraints and fostering inclusive, resilient, and sustainable livelihood empowerment among rural stakeholders in the region.

Acknowledgment

The authors sincerely acknowledge the technical support provided by the Block development Office, Haringhata Block, Govt. of WB, DREF, WBUAFS & financial support extended by the ICAR Farmer FIRST Project, ATARI, Min. of Agril. & FW, Govt. of India, Kolkata& New Delhi.

References

1. Bhandari H, Kumar A. Linking horticulture farmers to markets: Policy perspectives for inclusive growth. Agric Econ Res Rev. 2021;34(1):45-54.
2. Biswas S, Mandal M, Ray S. Socio-economic and

cultural factors influencing livelihood diversification among rural households in West Bengal. J Community Mobil Sustain Dev. 2018;13(2):215-22.
3. Bordoloi R, Das D. Income diversification and livelihood vulnerability among rural households: Evidence from Assam. Agric Econ Res Rev. 2019;32(1):115-23.
4. Chakraborty S, Saha D. Role of physical infrastructure in shaping livelihood security and constraint perception among smallholders in West Bengal. J Rural Dev. 2018;37(2):287-97.
5. Chauhan TR, Sharma M, Singh S. Constraints perceived by livestock farmers in adoption of improved dairy farming practices. Indian J Ext Educ. 2015;51(3):23-27.
6. Das R, Deka CR. Socio-economic correlates of livelihood diversification among rural households in Assam. Indian J Ext Educ. 2020;56(3):76-82.
7. Islam M, Nath T. Impact of education and training on livelihood improvement of small-scale farmers in Eastern India. J Rural Dev. 2017;36(4):623-36.
8. Kaur M, Singh R. Gender dimensions of constraints in agriculture and allied sectors: A rural perspective. Indian J Ext Educ. 2017;53(2):45-49.
9. Kumar A, Singh RK, Sahoo BB. Socio-economic determinants of livelihood constraints among rural households engaged in livestock rearing. Indian J Ext Educ. 2021;57(3):89-94.
10. Kumar D, Singh N. Constraints and prospects of integrated farming systems in sustainable rural livelihoods. Agric Ext Rev. 2019;31(4):12-18.
11. Kumar N, Singh R. Socio-economic determinants of farm livelihood sustainability among rural families in Eastern India. Indian J Ext Educ. 2021;57(4):82-88.
12. Kumar S, Singh R, Pandey VK. Influence of socio-economic factors on adoption of improved livestock practices among rural farmers. Indian J Ext Educ. 2020;56(3):45-51.
13. Mandal M, Biswas S, Ray S. Socio-economic evaluation of integrated farming systems in Eastern India. J Rural Stud. 2017;55:120-128.
14. Meena MS, Sharma P, Chauhan R. Determinants of livelihood security among livestock farmers in semi-arid regions of India. J Community Mobil Sustain Dev. 2019;14(2):320-326.
15. Rao DP, Singh AK, Meena MS. Influence of access to physical assets on livelihood diversification and constraint perception among rural farmers in India. Indian J Ext Educ. 2020;56(4):105-111.
16. Rao M, Natchimuthu K. Challenges and prospects of smallholder livestock systems in India. Asian J Agric Dev. 2020;17(1):57-71.
17. Saha D, Paul S. Income-based disparities in access to agricultural resources and services among smallholders in eastern India. J Rural Dev. 2018;37(4):623-635.
18. Sharma P, Singh AK, Chauhan R. Influence of family composition on livelihood diversification among rural households. J Community Mobil Sustain Dev. 2019;14(2):354-359.
19. Singh P, Kumar R, Meena MS. Family dynamics and livelihood security among rural farming households. J Community Mobil Sustain Dev. 2018;13(2):244-249.
20. Singh P, Meena MS, Kumar R. Constraints perceived by livestock farmers in adopting improved dairy and fishery practices in eastern India. Indian J Ext Educ. 2020;56(3):92-98.
21. Singh P, Sharma P, Meena MS. Constraints perceived by farmers in adoption of horticultural enterprises in rural India. J Community Mobil Sustain Dev. 2020;15(2):254-260.
22. Singh R, Kumar A, Bhandari H. Market and infrastructural constraints in horticulture: Evidence from Eastern India. Indian J Agric Econ. 2018;73(2):244-258.
23. Sinha R, Singh PK. Landholding size and its relationship with livelihood diversification among rural households in eastern India. Indian J Ext Educ. 2020;56(4):91-96.