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DETERMINANTS OF LIVELIHOOD OPTION ADOPTED BY LANDLESS PEOPLE IN CENTRAL TERAI, NEPAL

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ABSTRACT

Land is the central asset of the rural-agrarian economy in Nepal, determining livelihoods and social identity. A study was conducted in the Central Terai districts, viz. Chitwan and Nawalparasi (West) in Nepal, to estimate the determinants of livelihood options. A total of 400 households were sampled from the study areas. The findings revealed that the primary occupation is agriculture, but that this is declining among marginalized groups. Age of the household head, area of cultivated land, livestock holdings, and distance to market play significant roles in the adoption of agriculture as a primary occupation. Whereas remittance received, the number of economically active members showed a negative influence. Logistic regression further confirmed that household expenditure pressures, access to loans, and skill training significantly shaped the desire to leave current occupations. At the same time, awareness of government livelihood policies stabilized current occupations by discouraging occupational shifts. The study highlights that landlessness in Nepal is both a cause and a consequence of rooted poverty, with minimal participation in government programs. Policy recommendations emphasize the need for integrated strategies, including equitable land redistribution and reform, secure tenure through land titling, targeted credit and input support, vocational training, and social protection measures. Collectively, such interventions are essential to enhance the resilience of landless households, reduce vulnerability, and promote inclusive development in Nepal's agrarian society.

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INTRODUCTION

Land is the most significant asset in Nepal's rural-agrarian economy (Pandey et al., 2021) and is considered essential for strengthening all aspects of a person's or household's social, economic, and personal development (Adhikari, 2008). In an agrarian society like Nepal, land-based livelihoods remain predominant due to limited employment opportunities generated by other sectors such as trade, commerce, and industry (Nepali and Pyakurel, 2011). Beyond economic sustenance, land ownership signifies identity, power, wealth, and political influence (Pandey, 2024), and land ownership and its distribution have always become one of the top political agendas of political parties and even the government of Nepal (Adhikari, 2019; Azadi et al., 2020; Aditya, 2022).

Landlessness is defined as the absence of legal land ownership or entitlement, leaving individuals without secure rights to the land on which they live or work (Wickeri, 2011). Approximately 1.34 million households - comprising about 25% landless peasants and squatters (referred to as *Sukumbasi*), around 17% landless Dalits, and 57% informal landholders - are living without formal land tenure and face ongoing threats of eviction

(LIRC, 2020). More than one-fourth of households, primarily comprising ethnic minorities, indigenous communities, and Dalits, lack ownership of agricultural land (AI-Nepal, CSRC, and JURI-Nepal, 2019). A common example is the sharecropping system, where peasants are required to give half of their agricultural produce to legally registered landowners (Adhikari, 2008; GoN, 2021; CSRC, 2018).

About 32.1% of landless and near-landless households (also termed "land-poor") face severe livelihood insecurity due to their lack of land entitlements (UNDP, 2004; Nepali and Pyakurel, 2011). Southard and Randell (2024) identify a lack of resources as a key driver of food insecurity, which in turn perpetuates poverty. In agrarian societies, landlessness and near-landlessness are both causes and consequences of rural poverty. Moreover, the landless are often excluded from benefiting fully from state-led development initiatives or public service delivery, thereby widening the gap and deepening inequality between the privileged and the marginalized (Biswakarma, 2018).

Landless people in the Central Terai region of Nepal, particularly in Chitwan and Nawalparasi (West), adopted a variety of informal and low-income livelihood strategies due to limited access to cultivable land and formal employment. Their primary livelihood sources are agricultural wage labor, construction work, informal farming, and the collection of forest products. In some cases, landless households produce and sell locally manufactured alcohol or seasonally migrate to India (Ojha et al., 2020; Sugden et al., 2014). Traditional ethnic groups, for example, the Mushahar and Bote, are dependent on fishing and collection but are limited by conservation policies and land-use policies (Paudel et al., 2018). To alleviate such concerns, (non) government agencies have initiated livelihood support schemes, including vocational training, microcredit access, and community savings societies (Tamang and Shrestha, 2017). Government initiatives like the Land Registration Program of the National Land Commission have attempted to provide land ownership to the landless, but implementation has been slow and bureaucratically constrained (GoN, 2021). As such, most landless families remain in a vulnerable position, with irregular earnings, lack of food, and restricted social mobility.

Landless households in Nepal's Central Terai face livelihood insecurity due to a lack of access to land and productive resources. Landless people often live in marginal areas with poor access to resources and services, which contributes to their livelihood insecurity. This forces landless people into low-paying agricultural labor jobs, off-farm informal work, and seasonal out-migration, leaving their livelihoods fragmented and insecure. It is essential to understand the determinants of livelihood elements in designing inclusive policy on land access, credit, skills, and social protection. Such evidence can be used to guide interventions that improve livelihood security and support balanced rural development for landless people. The study was designed with the objectives to explore the determinants of livelihood options in the Central Terai region of Nepal. The study explores agricultural engagement as a livelihood option among the marginalized community and further analyzes the socioeconomic factors and their role in enhancing the likelihood of adopting agriculture as a primary occupation. This study was geographically confined to two districts of Central Terai, which may limit the generalizability of findings across other ecological zones of Nepal. Data were largely based on self-reported responses, which may be subject to recall bias. Future studies should adopt longitudinal or comparative designs across provinces and integrate environmental factors, gender dimensions, and land tenure dynamics to enhance the applicability of policies.

METHODOLOGY

Study area

The study was carried out in the Landless clusters of the Bharatpur Metropolitan City and Madi Municipality of Chitwan district, and Sunawal Municipality and Ramgram Municipality of Nawalparasi (West of Bardaghat Susta) districts in southern central Nepal. Chitwan, located in Bagmati Province, is renowned for its Chitwan National Park, the resettlement of Tharu and hill migrants, agriculture, tourism, and the urban growth of Bharatpur. Nawalparasi (West) in Lumbini Province spans the Chure Hills to the Terai plains, with agriculture, trade, and diverse ethnic communities, including Tharus and Madhesis. Both districts are known for economic development, connectivity, and cultural significance.

Sample size and sampling procedure

The sample size from the population size of 8,537 households was determined by using the following formula given by Kothari (2004) at a 95% confidence level. Sample size (n):

$$n = \frac{N \cdot Z^2 \cdot p \cdot q}{e^2 \cdot (N-1) + Z^2 \cdot p \cdot q} = 368$$

(total study sample of 400 households selected for ease and representativeness)

Where, N = population of study area

Z = standard variate at a 95% confidence level (1.96)

e = error limit of 5% (0.05)

p = sample proportion

(value of 0.5, in which case 'n' was the maximum, and the sample yielded at least the desired precision)

q = 1 – p (0.5)

Initially, an assumption was made that two municipal levels from each district would be selected to ensure a minimum sample size of 100 households from each, resulting in a total study sample of 400 households. Bharatpur Metropolitan City and Madi Municipality were chosen to represent the urban and peri-urban areas of Chitwan district, respectively, while Sunawal Municipality and Ramgram Municipality were selected to represent the urban and peri-urban areas of Nawalparasi (West) district. In the second stage, cluster sampling was employed to identify clusters at the local level. The clusters within urban areas included slum settlements, temporary migrants, and working-class populations.

In peri-urban areas, the clusters comprised households engaged in significant agricultural production activities but with no landholdings as their primary livelihood source.

Finally, in the third phase, the list of households in each cluster was obtained from the respective local government bodies. Simple random sampling was then used to select the households in each cluster that were interviewed for the study.

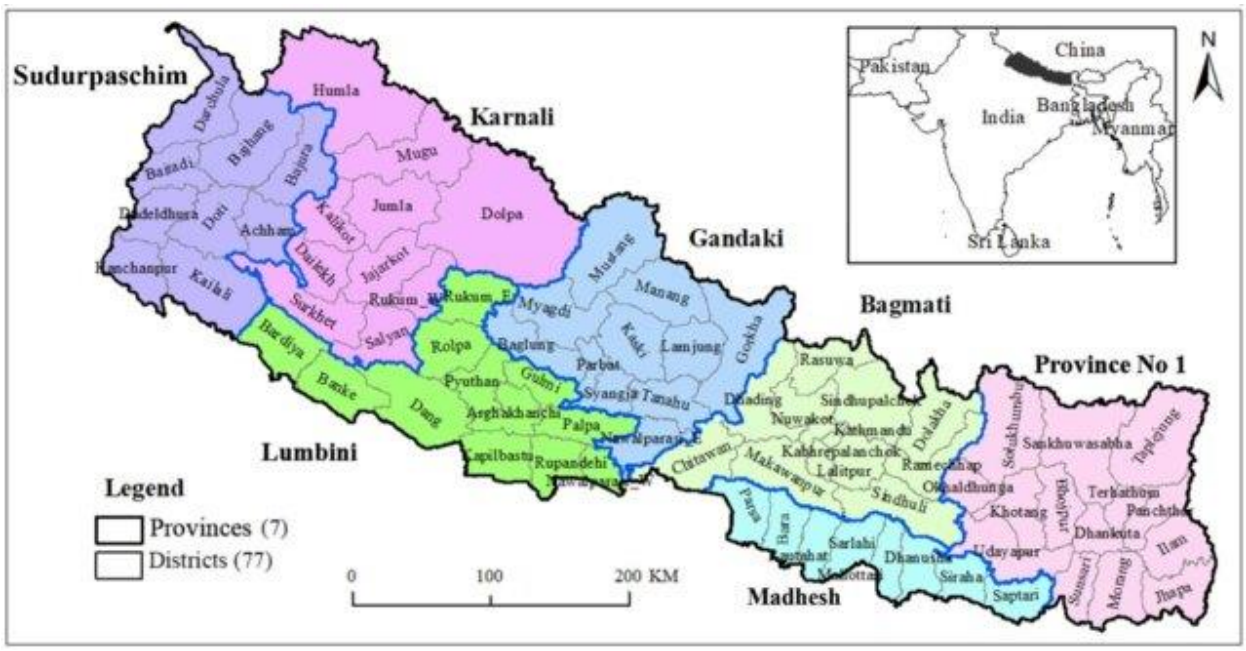

Figure 1. Map of Nepal showing the study site.

Data collection

The survey questionnaire was designed based on an extensive review of the literature of the research purpose with a view to gathering information for various aspects related to livelihood strategies and socio-economic vulnerabilities of landless people in Chitwan and Nawalparasi (West), including socio-demographic and socio-economic characteristics, attitudes and perceptions towards landlessness, experiences of socio-economic challenges, and the livelihood strategies that they follow. The data for the study were gathered from various primary stakeholders, including landless households, community groups, local government officials, and agents of land rights and development organizations, who possess important insights into the problems of landlessness and livelihood strategies. Primary data were collected through household surveys (400 households). Key informant interviews (22

informants), field observations, and focus group discussions (8 groups) were conducted to triangulate the data and explore the qualitative aspects of the study, providing in-depth insights into livelihood options, institutional gaps, and the effectiveness of current support programs.

Data analysis

Descriptive statistics, including mean, frequency, and percentage, were used to summarize the data. The analysis of factors influencing the adoption of primary occupation (livelihood option) was conducted using a binary logistic regression model. Several researchers (Mukwedey and Mudhara, 2023; Yobe et al. 2019; Ahmed et al., 2018; Yussuf et al., 2021) have similarly employed binary logistic regression to assess the factors influencing livelihood adoption. The model was represented by the following equation:

Logit (P) = $\beta_0 + \sum_{i=1}^{16} \beta_i \quad X_i$

Where; Logit(P) is the log-odds of adopting the primary occupation (livelihood option),

β0 is the constant (intercept),

β1, β2,...,β16 are the coefficients corresponding to each independent variable, table 1 represents these variables

Table 1. Description of the variables used in the model

Variables	Description	Expected Sign
Gender HH	Dummy, 1= Male, 0= otherwise	+/-
Age HH	Continuous, Years	-
Years of formal education HH	Continuous, Years of school attained	+/-
Family structure	Dummy, 1= Nuclear, 0= otherwise	+/-
Economically active household members	Continuous, No. of members	+/-
Receipt of remittance	Dummy, 1= Yes, 0=otherwise	+/-
Total cultivated land	Continuous, Land area in kattha	+
Availability of irrigation	Dummy, 1= Yes, 0=otherwise	+
Livestock holding	Continuous, Livestock Holding Unit	+
Distance to market	Continuous, km	+/-
Training related to the current job	Dummy, 1= Yes, 0=otherwise	+
Access to a loan	Dummy, 1= Yes, 0=otherwise	+
Membership in an organization or group	Dummy, 1= Yes, 0=otherwise	+/-
Receipt of technical assistance for livelihood	Dummy, 1= Yes, 0=otherwise	+/-
Support received from the government	Dummy, 1= Yes, 0=otherwise	+/-
Awareness of the government policy on livelihood	Dummy, 1= Yes, 0=otherwise	+/-

The study also employed a binary logistic regression model to identify the determinants influencing respondents' desire to leave their current job or occupation. The dependent variable was the expressed desire to leave the current occupation (yes = 1, no = 0).

RESULTS

Sociodemographic, Economic, and Institutional Characteristics

The results of the study in Table 2 indicate variation across districts in household composition, remittance receipt, irrigation access, loan access, and group membership. Of the 400 households surveyed, 73% were male-headed, 27% were female-headed, with no statistically significant variation across the districts. Joint families were the most common (57.8%), followed by nuclear (36.0%) and extended families (6.3%), with nuclear families significantly higher in Chitwan. The remittance receipt was significantly higher in Nawalparasi (67.5%) than in Chitwan (50.5%), and access to irrigation was low overall (24.8%), but statistically higher in Nawalparasi. Access to a loan was more common in Nawalparasi (52.5%) than in Chitwan (26.0%), with group membership being statistically higher in Chitwan (61.0%) than in Nawalparasi (49.5%). Job training, technical support to employment, government program assistance, and awareness of government policies were low in both districts.

Table 3 presents the socio-demographic household characteristics of the study area in continuous variables. The household heads' average age was 47.68 years, and

there was no difference between Nawalparasi and Chitwan. Years of education were 3.07 years on average, significantly higher in Nawalparasi (3.73) compared to Chitwan (2.41), and the economically active household members numbered 3.62 on average, once higher in Nawalparasi (3.85) compared to Chitwan (3.39). Total land cultivated averaged 9.27 ropani per household with no location difference, whereas livestock holdings averaged 1.65 units, significantly higher in Chitwan (1.90) than in Nawalparasi (1.39).

Table 2. Socio-demographic, economic, and institutional characteristics of households in the study area (categorical variable).

Variables	Overall	Location		Chi-square value	p-value
		Nawalparasi	Chitwan		
Gender HH					
Male	292 (73.00)	149 (74.50)	143 (71.50)	0.457	0.499
Female	108 (27.00)	51 (25.50)	57 (28.50)		
Family structure					
Nuclear	144 (36.00)	61 (30.50)	83 (41.50)		
Joint	231 (57.75)	123 (61.50)	108 (54.00)	6.295	0.043**
Extended	25 (6.25)	16 (8.00)	9 (4.50)		
Receipt of remittance	236 (59.00)	135 (67.50)	101 (50.50)	11.947	0.001***
Availability of irrigation	99 (24.75)	60 (30.00)	39 (19.50)	5.919	0.015**
Training related to the current job	28 (7.00)	15 (7.50)	13 (6.50)	2.626	0.453
Access to a loan	157 (39.25)	105 (52.50)	52 (26.00)	29.451	0.000***
Membership in an organization or group	221 (55.25)	99 (49.50)	122 (61.00)	5.349	0.021**
Receipt of technical assistance for livelihood	36 (9.00)	18 (9.00)	18 (9.00)	0.00	1.000
Support received from the government program	53 (13.25)	33 (16.50)	20 (10.00)	3.676	0.055*
Awareness of the government policy on livelihood	104 (26.00)	52 (26.00)	52 (26.00)	0.00	1.000

Note: Figures in parentheses indicate percentage; *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Source: Survey, 2023

Table 3. Socio-demographic characteristics of households of the study area (continuous variable).

Variable	Overall	Location		Mean difference	t-value	P-value
		Nawalparasi	Chitwan			
Age HH	47.68 (13.36)	47.62 (13.83)	47.76 (12.90)	-0.14	-0.105	0.917
Years of Education (HH head)	3.07 (3.83)	3.73 (3.89)	2.41 (3.65)	1.31	3.468	0.001***
Economically active member (in HH)	3.62 (2.02)	3.85 (2.11)	3.39 (1.90)	0.47	2.307	0.021**
Total cultivated land	9.27 (9.59)	8.65 (8.61)	9.88 (10.46)	-1.23	-1.284	0.199
Livestock holding	1.65 (2.34)	1.39 (1.97)	1.90 (2.63)	-0.51	-2.166	0.030**

Notes: Figures in parentheses indicate the standard deviation. **, *** indicate significance at the 5%, and 1% levels, respectively. Source: Survey, 2023

Primary and Secondary Occupation of Family

There was a clear pattern of socio-economic stratification along ethnic lines, shaped mainly by historical caste roles (Table 4). Chitwan displayed greater occupational diversity and engagement across sectors than Nawalparasi, indicating wider access to livelihood opportunities in more developed regions. Janajati families were predominantly engaged in agriculture, especially in Nawalparasi, while Muslim and Madhesi families showed the least participation in agriculture, particularly in Nawalparasi.

Brahmin/Chhetri households lead in non-agricultural employment, followed closely by Muslim and Madhesi families in Chitwan, who were also significantly involved in non-farm activities.

Table 4. Response of respondents about the occupational pattern of family members among different ethnic groups in the study districts.

Sectors	Districts	Ethnic groups								Overall	
		Brahmin/ Chhetri		Janajati		Occupational Caste		Muslim and Madhesi			
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Primary occupation											
Ag.	Chitwan	1.00	1.26	1.43	1.76	1.14	1.68	1.00	1.49	1.24	1.64
	Nawalparasi	1.19	1.58	1.59	2.03	0.79	1.48	0.51	0.98	1.12	1.68
	Total	1.11	1.46	1.50	1.88	1.08	1.65	0.58	1.07	1.18	1.66
Non-ag.	Chitwan	1.37	1.14	0.97	0.97	1.25	1.07	1.50	1.51	1.16	1.07
	Nawalparasi	1.39	1.27	1.21	1.07	1.00	1.18	1.33	1.47	1.28	1.25
	Total	1.38	1.22	1.08	1.02	1.21	1.09	1.36	1.47	1.22	1.16
Secondary occupation											
Ag.	Chitwan	0.37	0.97	0.26	0.65	0.11	0.48	0.40	0.84	0.24	0.68
	Nawalparasi	0.52	0.97	0.39	1.05	0.14	0.53	0.46	1.18	0.43	1.04
	Total	0.46	0.97	0.32	0.85	0.12	0.49	0.45	1.14	0.33	0.88
Non-ag.	Chitwan	0.17	0.62	0.19	0.74	0.30	0.95	0.60	1.07	0.24	0.82
	Nawalparasi	0.15	0.41	0.20	0.59	0.07	0.27	0.12	0.38	0.16	0.47
	Total	0.16	0.50	0.19	0.68	0.26	0.88	0.19	0.53	0.20	0.67
Natural-based occupation											
	Chitwan	1.14	1.38	1.07	1.36	0.77	1.43	0.70	1.34	0.97	1.38
	Nawalparasi	0.50	1.08	0.71	1.25	0.00	0.00	0.14	0.40	0.44	1.00
	Total	0.75	1.20	0.90	1.31	0.63	1.31	0.22	0.62	0.70	1.21
Non-natural-based occupation											
	Chitwan	0.60	0.85	0.67	0.96	1.22	1.17	1.60	1.43	0.88	1.08
	Nawalparasi	0.28	0.71	0.64	1.53	0.00	0.00	0.23	0.57	0.38	1.07
	Total	0.40	0.77	0.66	1.25	1.00	1.07	0.43	0.75	0.63	1.07

Note: SD, standard deviation Source: Survey, 2023

Secondary occupations were generally limited across all ethnic groups. However, Brahmin/Chhetri families showed relatively more involvement in agricultural activities, whereas Occupational caste members in Chitwan had greater participation in agricultural secondary occupations. If categorized by the nature of work, Brahmin/Chhetri and Janajati households were more reliant on natural-based livelihoods such as farming, livestock, and forestry. In contrast, the Occupational caste and Muslim/Madhesi families were more involved in non-natural-based occupations such as trade, services, and wage labor (Table 4).

Determinants of livelihood options

The logistic regression analysis presented in Table 5 identifies key factors influencing the adoption of agriculture as a primary occupation (livelihood option) among rural households, and the model was statistically significant. Among the variables, the age of the household head showed a significant positive influence, suggesting that older individuals are more likely to adopt or remain in a primary occupation, potentially due to accumulated experience or stability. Similarly, the size of total cultivated land and the number of livestock holdings were positively associated with the likelihood of adopting a primary occupation, highlighting the importance of productive assets in determining livelihood choices. Distance to the market also showed a significant positive effect, indicating that households farther from markets may rely more heavily on consistent local livelihood activities due to limited access to alternative employment.

Table 5. Factors influencing the adoption of agriculture as a primary occupation (livelihood option).

Variables	Coefficient	SE	z-value	p-value
Gender	-0.0266	0.1672	-0.16	0.874
Age	0.0203	0.006	3.38	0.001**
Years of formal education	0.0047	0.0202	0.23	0.817
Family structure	-0.1794	0.154	-1.16	0.244
Economically active household Members	-0.1167	0.0599	-1.94	0.052
Receipt of remittance	-0.5248	0.2572	-2.04	0.041**
Total cultivated land	0.6713	0.253	2.65	0.008**
Availability of irrigation	-0.1015	0.1673	-0.61	0.543
Livestock holding	0.1129	0.024	4.67	0.000**
Distance to market	0.0646	0.0125	5.15	0.000**
Training on the current job	0.0475	0.198	0.24	0.811
Access to a loan	0.1571	0.1486	1.06	0.29
Organizational Membership	0.0809	0.1486	0.54	0.586
Receipt of technical assistance for livelihood	0.2568	0.2582	0.99	0.32
Support received from government program	-0.3393	0.2215	-1.53	0.126
Awareness of the government policy on livelihood	-0.1254	0.1676	-0.75	0.454
Constant	-1.6853	0.4022	-4.19	0.000**

Notes: Number of Observations: 400; LR Chi^2 (16): 123.36; Prob <0.0001; Pseudo R^2: 0.2306

Conversely, receipt of remittances had a significant negative impact on adopting a primary occupation (p = 0.041), implying that households receiving external financial support are less likely to pursue stable local livelihoods, possibly because remittances reduce the urgency for income generation at home. The number of economically active household members was negatively associated with occupation adoption, though marginally significant (p = 0.052), possibly indicating that such households diversify their income sources rather than focusing on a single primary activity. Other variables such as gender, years of formal education, family structure, availability of irrigation, training, access to loans, group membership, receipt of technical or government support, and awareness of livelihood-related government policies did not show statistically significant effects. The constant term was significant (p < 0.001), reflecting a strong baseline resistance to livelihood adoption when all predictors are absent.

Factors affecting changes in the current job

The regression analysis revealed several key factors influencing the desire to leave the current job or occupation. Among the 15 variables examined, four were found to be statistically significant at the 5% level. The log of monthly household expenses had a positive and significant effect, indicating that individuals from households with higher expenses are more likely to seek alternative employment, possibly due to financial pressure or the need for better income opportunities. Similarly, those who had received training for their current job were also more inclined to consider leaving, suggesting that training may enhance their skills and confidence to explore new opportunities. Access to loans showed a strong positive association, implying that financial resources can facilitate occupational mobility by enabling investment in new ventures or transitions. In contrast, awareness of government policy on livelihood had a significant negative effect, meaning that individuals who are informed about such policies are less likely to want to leave their current occupation, possibly due to perceived support or security. Other variables such as gender, age, education, family structure, landholding, irrigation, and livestock were not statistically significant, although gender approached marginal significance.

Table 6. Factors affecting desire to leave current job/occupation.

Variables	Coefficient	SE	z-value	p-value
Gender	0.3854	0.2038	1.89	0.059
Age	-0.0073	0.0067	-1.09	0.278
Years of formal education	0.0259	0.0224	1.16	0.248
Family structure	-0.0784	0.1746	-0.45	0.654
Economically active Population	-0.0656	0.0698	-0.93	0.351
Total cultivated land	0.0143	0.2696	0.05	0.958
Availability of irrigation	-0.2313	0.206	-1.12	0.246
Livestock holding	0.0535	0.0354	1.51	0.132
Log of monthly household expenses	0.336	0.1377	2.44	0.015**
Distance to market	0.0021	0.0012	1.71	0.087
Training on the current Job	0.3065	0.1391	2.2	0.028**
Access to a loan	0.4776	0.1681	2.84	0.004**
Organizational Membership	-0.1198	0.1634	-0.73	0.465
Support received from government program	0.1662	0.253	0.66	0.508
Awareness of the government policy on livelihood	-0.4586	0.1941	-2.36	0.018**
Constant	-4.2574	1.4043	-3.03	0.002**

Notes: Number of Observations: 400; LR Chi^2 (15): 36.35; Prob =0.0016; Pseudo R^2: 0.1033

There are several options for addressing landlessness and improving the livelihoods of landless households. Here are some potential strategies. One approach to addressing landlessness is to redistribute land from large landowners to landless households. This can be done through government programs or community initiatives, and may involve land purchases, land swaps, or other forms of land transfer.

Land reform policies that address land fragmentation, unequal distribution, and other issues can help improve land access and use for smallholder farmers. This may involve measures such as land consolidation, land titling, and land use planning. Improving access to credit and inputs, such as seeds, fertilizers, and irrigation technologies, can help landless households enhance their agricultural productivity and income. This can be done through government programs, microfinance initiatives, or private sector partnerships.

Providing landless households with skills development and training can help them access higher-paying jobs and increase their income. This may involve vocational training programs, apprenticeships, or other forms of skill development. Social protection programs, such as cash transfers, food subsidies, and social insurance, can help reduce the vulnerability of landless households and improve their wellbeing. Land leasing and sharecropping arrangements can provide landless households with access to land for cultivation or other uses. However, these arrangements should be designed in a way that protects the rights and interests of landless households and prevents exploitation.

Overall, addressing landlessness requires a comprehensive approach that considers multiple factors and involves the participation of different stakeholders, including government, civil society, and private sector actors. A combination of policies and interventions that promote land redistribution, land reform, access to credit and inputs, skill development and training, social protection, and land leasing and sharecropping may be most effective in addressing landlessness and improving the livelihoods of landless households.

DISCUSSION

Sociodemographic Context

This study identifies the socio-demographic, economic, and institutional features of Nawalparasi and Chitwan districts, Nepal, with distinct livelihood systems based on local context. Household heads' gender composition was similar between districts, reflecting Nepal's rural patriarchal framework (Acharya and Bennett, 1981), with slightly higher female-headed households in Chitwan likely linked to male out-migration (Seddon et

al., 2002). Family structure differed significantly, with joint families more prevalent in Nawalparasi and nuclear families more prevalent in Chitwan, showing socio-cultural resilience and risk-sharing strategies versus urban-influenced socio-economic transformation (Fricke et al., 1993; Ghimire and Hoelter, 2007). Economically, there was a strong reliance on remittances in Nawalparasi families that served as a source of income (World Bank, 2022; Meyer and Shera, 2017; Dhakal, 2018). In Chitwan, however, there was more social capital with organizational membership being more significant, allowing easier access to information, markets, and diversified livelihood (Putnam, 2000; Pretty, 2003). Institutional assistance in the form of technical guidance, government program participation, and awareness of policy was similarly low in both districts, indicative of the prevalent extension and policy outreach gaps common in South Asia (Anderson and Feder, 2004; Subedi, 2020).

The contrast between Nawalparasi and Chitwan households reveals two contrasting livelihood systems guided by human capital, economic activities, and institutional access. Nawalparasi household heads are more educated (3.73 vs 2.41 years), which, against expectations, guides out-migration rather than local development, consistent with the selective migration model (Seddon et al., 2002). This educational advantage reinforces greater access to formal credit (52.5% versus 26.0%) and irrigation (30% versus 19.5%), enabling investment in intensified farming and risk-coping mechanisms (Chen et al., 2021; Moahid and Maharjan, 2019). More extensive, larger family structures in Nawalparasi (61.5%) provide a substantial domestic labor pool for managing farms, but might also create pressure for structural out-migration, underpinning a remittance-based economy (Ellis, 2000; Massey et al., 1993). Chitwan, by contrast, has smaller nuclear families with fewer economically active members, greater dependence on livestock (1.90 vs 1.39 units), and greater social capital in the form of membership in groups (61% vs 49.5%), which enables livelihood diversification and local level resource management despite less human and financial capital (Putnam, 2000; Pretty, 2003). Both districts have worrisomely low levels of access to technical support (9%) and awareness of government policy (26%), suggesting systemic institutional deficits in rural service delivery (Anderson and Feder, 2004; Subedi, 2020).

Occupation and Employment

Janajati families continue to be predominantly engaged in agriculture, especially in Nawalparasi, indicating the continuity of occupations typical of indigenous Nepalis (Sharma et al., 2021; Bhandari, 2013). In contrast, Brahmin/Chhetri households will be more likely to be working in non-farm employment, most significantly in Chitwan, under the assumption of greater educational attainment and improved social capital, which results in entry into business, semi-skilled work, and formal sector employment (Acharya & Bennett, 1981; Mahato & Paudel, 2023). Madhesi and Muslim households experienced the least farm participation, particularly in Nawalparasi, a pattern that is shaped by occupational specialization throughout history and land constraint (Asian Development Bank, 2005). Their relatively higher business and entrepreneurship participation in Chitwan is consistent with peri-urban settlement patterns and adaptation to market-oriented economies (Sharma, 2010). Chitwan's greater occupational diversification compared to Nawalparasi reflects its better infrastructure and proximity to towns, further livelihood opportunities outside agriculture (Thapa and Weber, 1996; Paudel et al., 2017). The secondary occupation remains limited, with most households relying on a single principal source of income. Brahmin/Chhetri households tend to complement off-farm work by secondary farming activities due to either land availability or persistent cultural adherence to agriculture (Darko et al., 2025). Muslim/Madhesi families and occupational caste have increasing involvement in services, trade, and wage employment, with an increasing trend towards market-based economic activities under the backdrop of broader rural-urban change processes in South Asia (Sharma, 2021).

Determinants of livelihood

The logistic regression analysis revealed that a combination of demographic factors, asset ownership, and external income flows strongly influences the adoption of a primary occupation among rural households. The positive association between the age of the household head and adoption of a primary occupation ($p = 0.001$) suggests that older individuals are more likely to commit to a single livelihood. This aligns with literature from Nepal and South Asia indicating that older farmers tend to possess greater agricultural knowledge, stronger local networks, and

more established tenure security, all of which encourage livelihood stability (Paudel et al., 2014; Sugden et al., 2014). In the study context, both districts reported similar average household head ages (~47.7 years). Still, the stronger agricultural orientation in Nawalparasi (71% agriculture-dependent households) compared to Chitwan (51%) suggests that age effects may interact with the occupational structure, possibilities of off-farm employment opportunities, and cultural attachment to farming.

Asset ownership emerged as a key determinant, with larger cultivated landholdings ($p = 0.008$) and higher livestock numbers ($p < 0.001$) significantly increasing the adoption of agriculture as a primary livelihood option. Prior studies in Nepal (Nepali et al., 2024; Jha, 2019) and South Asia (Birthal et al., 2015) confirm that households with more productive assets are better able to sustain consistent agricultural or livestock-based income, reducing the need for diversification. In this study, livestock holdings were higher in Chitwan (3.76 vs. 2.64 in Nawalparasi). At the same time, land size was comparable, potentially explaining why Chitwan households, despite more diversified livelihoods, still retain strong agricultural engagement.

The finding that distance to market was positively related to occupation adoption ($p < 0.001$) appears counterintuitive, as market access is often considered a facilitator of livelihood diversification (Ellis and Allison, 2004). However, households farther from markets may have fewer opportunities for off-farm work, compelling them to rely on stable, local livelihood sources. This is consistent with the vulnerability data showing that Chitwan households, located farther from both input and output markets, may depend more on self-contained livelihood systems despite facing greater environmental stressors.

A notable result was the negative influence of remittance receipt on primary occupation adoption ($p = 0.041$). Remittance income can reduce reliance on labour-intensive agriculture by providing alternative financial security (Wagle and Devkota, 2018; Acharya, 2022; Sapkota, 2013). In both districts, migration has reshaped households' economies, with remittances often financing non-agricultural investments or even leading to land abandonment. Given Nawalparasi's better institutional access (loans, organizational membership) and higher political participation, remittances there may further facilitate occupational shifts away from farming.

The number of economically active household members showed a marginally significant negative effect ($p = 0.052$), possibly reflecting a deliberate risk-spreading strategy, where households allocate labour across multiple sectors rather than concentrating on one. This resonates with evidence from rural Nepal and India showing that labour diversification is a common response to climatic uncertainty and market volatility (Maharjan et al., 2020; Choquette-Levy, 2023).

Determinants of occupational stability and change

The study of occupational change (adoption of a primary occupation) and the desire to change occupations revealed that both convergences and divergences are the determinants of rural livelihood pathways in Chitwan and Nawalparasi. Together, these findings interplay between economic pressure, skills, institutional arrangements, and household assets in influencing rural employment dynamics in Nepal. The regression analysis showed that higher monthly household expenses significantly increased the likelihood of planning to leave the current occupation. This indicates that financial pressure is a powerful stimulus for occupational change, consistent with findings from rural Nepal showing that rising living costs, coupled with precarious farm incomes, push households to seek higher-income employment (Khanal, 2025; Acharya, 2024; Bist, 2021). In the South Asian context, similar patterns are reported where high expenditure-to-income ratios induce outmigration or occupational changes, particularly in semi-commercial farming areas (Deshingkar and Grimm, 2005). Chitwan's relatively higher average household expenses (NRs. 30,724 versus 27,547 in Nawalparasi) can explain a stronger incentive for economic re-orientation despite higher livestock holdings.

Training for the current job was positively associated with the intention to change jobs. Training in this study could have opened the participants' eyes to new techniques or opportunities that encouraged them to seek other means of livelihood, especially in Nawalparasi, where institutional support and access to information were higher. Whereas access to credit was another major positive determinant of occupational change. Credit access can initiate entrepreneurship and investment in new livelihood activities, as discovered in rural finance studies in Nepal (Pandey, 2022) and Bangladesh (Pravin et al., 2020). Such a result implies that financial capital not only supports livelihood

resilience but also enables occupational transformation, particularly for households that desire to transition out of subsistence farming. Importantly, awareness of government livelihood programs and policies reduced the intention to change the present occupation. This could be a stabilizing effect of perceived institutional support, where awareness of policy can strengthen belief in current livelihood viability. Previous Nepalese data indicate that awareness of subsidy, insurance schemes, or farming development programs can strengthen commitment to agriculture, especially among landowners (Ghimire and Chapagain, 2023; Bezati et al., 2024). This effect would have been more substantial in Nawalparasi, where organizational membership and political participation were higher, due to greater exposure to state programs.

CONCLUSION

This study explores the determinants of livelihood decisions of landless households in Nepal's Central Terai, identifying that land remains a central asset in rural livelihood making. Landlessness, due to historical, political, and socio-economic marginalization, falls hardest on Dalits, indigenous groups, and other socio-economically marginalized groups, who rely on low-wage, casual livelihood strategies such as agricultural wage labor, construction, and seasonal migration. Agriculture remains the dominant occupation, with adoption being primarily driven by family socio-economic traits, including the age of the household head, cultivated land area, and market access. In contrast, remittances and a higher number of economically active household members promote diversification of livelihood options. Pressures of household expenditure, access to loans, and skills acquired through training significantly impact the choice of occupation, effectively increasing the incentive to quit current employment as individuals develop skills and identify alternative earning opportunities. At the same time, awareness of government livelihood policies stabilizes current occupations. Landlessness is both a cause and an effect of long-term poverty, limiting participation in official government schemes. To address these vulnerabilities, an integrated package of interventions like equitable land redistribution and secure tenure, improved credit access and vocational training, skills development schemes, and targeted social protection interventions is required to enhance the resilience of landless households, reduce their vulnerability, and promote inclusive development in Nepal's agrarian context.

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