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The Saptagandaki Journal

Editorial ....

As we present the 15th volume of our research publication, the Saptagandaki Journal *(TSJ)*, we are pleased to feature a diverse array of studies that explore key challenges, opportunities, and transformative trends shaping the nation's financial, managerial and developmental landscapes. From employee stress in the context of mergers and acquisitions (M&As) within Nepalese banking and financial institutions (BFIs) to the empowerment of women through financial literacy, this issue highlights the multidimensional nature of socio-economic transformation in Nepal.

One of the most persistent issues examined in this volume is the study by Prakash Shrestha and Guna Raj Chhetri on the factors affecting employee stress during M&As in Nepal's BFIs. Their research, conducted through interviews with 60 employees across various levels in five merged institutions, uncovers the nuanced factors that contribute to employee stress. Changes to compensation and benefits, leadership transitions, cultural shifts and job insecurity are identified as the most significant organizational stressors. The findings emphasize the importance of proactive human resource management in reducing stress through practices such as clear communication, employee mentoring, and cultural integration. This study underscores that while M&As are often seen as opportunities for organizational growth, they must be managed with attention to employee well-being if they are to succeed in the long term.

Dhanaraj Chlaise, Sadiksha Adhikari and Harshita Lekhak contribute to current understanding of corporate governance in Nepal's telecommunications sector. Through a rigorous analysis of factors such as ownership structure, board diversity, political influence, and the role of technology, the authors offer critical insights into how these elements shape corporate governance practices. The study highlights that ownership structure in Nepalese telecommunication companies has a negative

impact on corporate governance, suggesting that improving governance structures can significantly enhance firm performance and sectoral competitiveness.

This issue also includes an important quantitative analysis by Omkar Poudel, Pradeep Acharya, Umesh Rijal, Daya Simkhada, and Bishnu Bahadur Khatri examining the role of government expenditure on private sector investment in Nepal. Their use of a time-series approach over 49 years of data provides valuable insights into how government spending affects private investment. The study identifies a positive long-term relationship between real GDP and private sector investment, while highlighting the mixed effects of government expenditure. Infrastructure-related spending has a crowding-in effect, encouraging private investment, while non-infrastructure spending can have a crowding-out effect. Inflation, represented by the CPI, has a negative impact on private sector investment, creating uncertainty and raising costs. The foreign exchange rate demonstrates a marginally significant positive effect on private investment. This research offers critical implications for policymakers seeking to stimulate private investment and foster economic growth in Nepal.

In the realm of rural development, Krishna Prasad Gyawali and Sharad Mani Kharel address the intersection of climate change and livestock-centric agriculture in Gaindakot Municipality, Nawalpur district of Nepal. Their study reveals how climate change has adversely affected livestock health, impacting rural livelihoods and food security. Barriers to the broader adoption of climate resilient practices including the lack of farmers' awareness and limited access to resources, were noted. The study also emphasizes stronger policy support and further interventions to promote sustainable agricultural practices. The authors call for greater policy support and enhanced adoption of climate-resilient agricultural practices, such as drought-resistant fodder and water conservation techniques. This research highlights the need for adaptive strategies to ensure sustainable agricultural practices and protect the livelihoods of rural communities in Nepal.

Finally, financial literacy, as an empowering tool for women, is explored in the study by Ashmita Dahal Chhetri, which investigates the relationship between financial literacy and women’s empowerment in Chitwan. The study reveals that financial knowledge and skills are negatively correlated with women’s empowerment, while financial behavior, attitude, and awareness have a positive impact. This research underscores

the pivotal role that financial literacy can play in enhancing the socioeconomic status of women and promoting gender equality, particularly in rural areas where financial inclusion remains a challenge.

Together, these articles underscore the importance of addressing both macroeconomic and micro-level challenges for sustainable development in Nepal. Whether it is navigating the human dimensions of corporate restructuring, fostering private sector investment, adapting to climate change, empowering women through financial literacy, or improving corporate governance practices, these studies provide practical insights for policymakers, business leaders, and scholars alike.

As we move forward, it is crucial that we embrace both the challenges and opportunities presented by these evolving dynamics. The diverse range of topics in this issue serves as a reminder that thoughtful research and innovative solutions are vital to overcoming the barriers to sustainable growth and development. We hope these studies spark further research, dialogue, and action, contributing to a more resilient and inclusive future for Nepal.

We thank all our contributors for their valuable research and the readers for their continued support of this journal. We look forward to your thoughts, feedback, and engagement as we continue to explore the complex and interconnected issues facing Nepal's economy and society.

Kapil Deb Subedi, Ph.D.

Editor in Chief

November, 2024

Original Research Article

Factors Creating Employee Stress in Mergers and Acquisitions Practices in Bank and Financial Institutions of Nepal: Employee perspectives

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Abstract

This study aims to explore major factors creating employee stress in Merged and Acquisitions (M&As) practices in the context of Bank and Financial Institutions (BFIs) in Nepal. It has followed a qualitative approach to present the factors creating employee stress in mergers and acquisitions. Using a purposive sample approach, 60 employees from Nepalese BFIs—including clerical to executive-level personnel—were chosen and were asked to participate in a number of interviews and talks to learn more about the effects of M&A procedures. These employees were personally contacted at the corporate, branch, and head offices of five merged BFIs of Nepal. The findings identify twelve significant elements that contribute to employee stress as a result of merger and acquisition practices in BFIs. They include changes to compensation and benefits, change in leadership, fear and uncertainty, cultural shifts, job security, prioritizing self-protection, increased workloads and responsibilities, future, lack of trust and confidence, impact on career progression, approval delays, and communication gaps. Direct, observable changes (such as leadership and salary) are linked to the highest levels of stress, whereas more general, abstract worries (such as cultural changes and future-related anxiety) are ranked lower. Proactively addressing these variables can reduce stress and increase the M&As practices' success. In fact, employee job stress can be reduced by

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encouraging employees to participate in productive work and maintaining strong motivation and commitment levels. Employee interaction, mentoring and peer support, employee well-being, key staff retention, and cultural integration are the most crucial HR initiatives for effective M&As incorporation. All of these will assist in decreasing job stress among employees as a result of the M&As practices.

Keywords: *Merger, Acquisitions, Stress, Factors, Bank and financial institutions*

Introduction

Change is the ultimate reality in every sphere: be it politics, economics, organizations, or individual lives. Everyone experiences strain and stress during a change period. In the business world, whatever changes occur in corporate lives have a direct impact on employee jobs and income. Therefore, it is thought that changes in organizational activities and practices have a direct impact on employee status and psychological characteristics. Merger and acquisitions (M&As) practices have recently emerged as one of the most important parts of organizational change. They have emerged as a useful strategic instrument for Nepal's banks and financial institutions (BFIs) to improve their equity base, grow their business, and achieve financial stability (Adhikari et al., 2023).

M&As have caused a change in the organizational life of BFIs (Shrestha, 2019). As a result, such practices have become an important topic of discussion and research for businesses seeking to make changes and prepare for tough market competition. Nepalese BFIs are currently experiencing unprecedented market turbulence, owing to a rapidly changing economic climate. Intense competition, advancements in modern technology, the global economic downturn, stock market volatility, and rising interest rates have all made it difficult for bankers to offer excellent performance and sustain their businesses. In such a context, combining two or more companies into one is a common strategy companies use to increase market share, cut costs, and create synergy (Wheelen et al., 2018; Rao, 2016).

M&As have recently become an emerging phenomenon in Nepal. In line with the worldwide environment, our banks and financial institutions are now engaging in M&As practices. Even though M&As are advantageous from many business perspectives, they can cause stress for employees, particularly those in mid-career

(Matteson & Ivanceich, 2008). M&As can be a tough process with unpredictable results (Bartels et al., 2006). Many difficulties appear to be related to M&A practices; employees of the new firm may feel insecure when their group is threatened by the infusion of new identities, and they are still expected to cope with the group of which they are already a part (Cartwright & Cooper, 2014). Consequently, employees may lose their psychological relationship with their groups, resulting in stress at work (Basnet & Acharya, 2018).

M&As may create uncertainties for employees. They are typically more stressed by such uncertainties than by the actual changes (Moran & Panasian, 2005). Such practices are especially stressful because employees have not evolved an appropriate set of coping skills to deal with such a fresh and emotional circumstance that affects a wide variety of job concerns (Schweiger & Ivancevich, 1987). In fact, companies primarily focus on cost-cutting methods during the M&As process, which may cause employees to be concerned about losing their employment. Spreading rumors and working the grapevine throughout the M&A process promote anxiety and, in many situations, lead to unproductive behaviors. These rumors often based on concerns rather than reality can greatly increase employee tension, nervousness, and pressure (Buone & Bowditch, 1989). This will make employees demotivated and discouraged.

Due to the growing number of banks and financial institutions in Nepal, this industry is becoming very competitive (Shrestha, 2018; 2019). As a result, Nepal Rastra Bank has made provisions for merging and acquiring these entities. On the one hand, such provisions have limited the number of banks and financial institutions while creating a favorable climate for them. Employees at these organizations, on the other hand, are concerned about their futures and positions as a result of merger and acquisition practices. Based on these discussions, this study aims to explore major factors creating employee stress in M&As practices in the context of BFIs in Nepal.

Literature Review

Prior studies suggest that job stress is an unacceptable outcome of M&A practice. Mergers are a type of organizational reorganization that results in increased workload, changes in roles and responsibilities, and an increase in job ambiguity, work overload, and conflict. In fact, mergers between different cultures reduce employee productivity and increase job stress because it is clear that some cultures favor the

process of transition while others oppose it (Sajeewani, 2012). Some other conditions in which people experience stress include loss of status and prior area of influence; a lack of openness about the company's aims; a tough battle for survival; increasing workloads as some individuals depart, either freely or involuntarily; and the indirect impact on their private lives (Habeck et al., 2000).

M&A practices, as some of an organization's unexpected and irregular strategic possibilities are regarded to differentiate employees' experiences from other types of organizational change, increasing their stress level (Cartwright, 2005). Employees are generally concerned about job security and are under pressure to keep their jobs. During the merger, BFIs hire personnel to demonstrate the merger's success and put pressure on current employees, who then rush to find new positions. Even if an employee appears to be joyful on the outside, they are actually stressed (Fayankinnu & Akinde, 2020). Furthermore, Sharma et al. (2023) argue poor communication, a culture of conflict, incompatible management leadership, an unbalanced structure, shoddy change management, a lack of a shared vision, and depressed motivation are obstacles to keeping employees after mergers and acquisitions.

Employees play a critical role in determining the success or failure of an M&As practices. However, failure to recognize changes in behavior, organizational structure, and prospective personnel results in a disruptive atmosphere within the company (Abdul Aziz Khan Niazi, 2021). These all create employee stress at work. Such practices cause severe suffering and dissatisfaction among personnel of the acquired and acquiring companies. Employees find it difficult to cope with rapid changes in the workplace, including restructuring, changes in job profiles, operating processes, integration, new teams, and changes in job positions, which eventually leads to stress (Gulia, 2020).

There is a concerning component that causes an instant decline in production following M&As practices because employees believe their security is jeopardized and are thus too distracted to accomplish their tasks properly (Geber, 1987). They sense more job insecurity as a result of merger procedures, as their firm experiences more changes. Employees of the acquired firm who are 'sold' as commodities may experience sentiments of worthlessness and inferiority as a result of the loss of autonomy and prestige (Moran & Panasian, 2005). When individuals disagree with their evaluation or accept positions that are beyond their capacity throughout the M&A process, they

experience role stress in the form of ambiguity, overload, or conflict. Furthermore, role ambiguity occurs when an organizational position lacks the appropriate information, resulting in role discontent, anxiety, fear, and animosity, as well as lower performance, which leads to role conflict and contradictory behavioral standards (Shrestha, 2019).

Joshi and Goyal (2013) found that M&As activities create job stress among bank employees. Furthermore, inconsistencies, insecurity, fears of job loss, shifts in position, payment, changes in power, status, fame, workloads, schedules, a technological problem at work, insufficient salary, time for family job worries at home, disparities between groups, and interactions are all stressors that contribute to an increase in job stress during the course of M&As practices (Joshi & Goyal, 2012). Anxiety and depression are two prevalent stress-related issues in the BFIs (Giogi et al., 2017). In fact, M&As practices create employee stress because such practices give very little concentration on the human side of enterprises (Sharma et al., 2023; Seo & Hill, 2005).

Research Methodology

This study has followed a qualitative approach to present the factors creating employee stress in mergers & acquisitions. Using a purposive sample approach, 60 employees from Nepalese BFIs—including clerical to executive-level personnel—are chosen. Conversations with these employees yielded information. As a result, they were asked to participate in a number of interviews and talks to learn more about the effects of M&A procedures. These employees were personally contacted at the corporate, branch, and head offices of five merged BFIs of Nepal (Table 1).

Table 1

Five merged BFIs

S.N.	Companies before Merger/Acquisition	Merger/ Acquisition	Companies After Merger/ Acquisition
1.	Prabhu Bank Ltd. and Grand Bank Ltd.	Merger	Prabhu Bank Ltd.
2.	Laxmi Bank Ltd. and Sunrise Bank Ltd.	Merger	Laxmi Sunrise Bank Ltd.
3.	Macchapuchhre Bank Ltd. and Standard Finance Limited	Merger	Macchapuchhre Bank Ltd.
4.	Nabil Bank Ltd. and Nepal Bangladesh Bank Ltd.	Acquisition	Nabil Bank Ltd.
5.	NIC Bank Ltd. and Bank of Asia Nepal Ltd.	Acquisition	NIC Asia Bank Ltd.

Discussions regarding the various facets and difficulties related to M&A practices were held by participants. They also discussed the main factors that lead to stress as a result of these practices. This study solely takes into account ideas and viewpoints that support its goals. The participants' details are shown in Table 2.

Table 2

Demographic Characteristics of the Participants

Gender	**Frequency**	**Percent**	**Age (years)**	**Frequency**	**Percent**
Male	40	66.7	21 - 34	46	77
Female	20	33.3	35 - 44	1	1.7
Marital Status			45 - 54	11	18
Married	36	60	55 to 60	2	3.3
Unmarried	24	40	More than 60	0	0
Education			**Job Level**		
Certificate (+ 2)	9	15	Clerical Level	44	73
Bachelor	23	38.3	Officer Level	15	25
Masters	28	46.7	Executive Level	1	1.7
Age			**Work experience**		
21 - 34	46	76.7	0 - 4 years	36	60
35 - 44	1	1.67	5 - 9 years	10	17
45 - 54	11	18.3	20 - 29 years	13	22
55 and above	2	3.33	30 years and above	1	1.7

Results and Findings

The empirical findings and results based on the responses of the selected BIF employees involved in M&As practices are presented in this section (Table 3).

Table 3

Factors Creating Employee Stress in Mergers & Acquisitions Practices

S.N.	Factors Creating Employee Stress in M&As Practices	Percent	Rank
1.	Fear and Uncertainty	98.3	3
2.	Job Security	95	5
3.	Changes to Compensation and Benefits	100	1
4.	Lack of Trust & Confidence	91.7	9
5.	Prioritizing self-protection	95	6
6.	Change in Leadership	100	2
7.	Cultural Shifts	98.3	4
8.	Communication Gaps	81.7	12
9.	Impact on Career Progression	88.3	10
10.	Increased Workloads and Responsibilities	95	7
11.	Approval Delays	85	11
12.	Future	93.3	8

Changes to Compensation and Benefits

Most of the participants agreed that changes to compensation and benefits are the main source of employee stress. In fact, anxiety and uncertainty are caused by employees' intense concern about how M&As may affect their salary and benefits.

Change in Leadership

Employees are particularly stressed by change in leadership because they are fearful of the new direction, management style, or lack of support and familiarity with their previous leaders.

Fear and Uncertainty

General fear and uncertainty about M&As, such as work assignments, business direction, or future stability, have a considerable impact on stress, nearly equaling the top two causes.

Cultural Shifts

Cultural shifts or integration are another key source of stress. Employee concern emerges from the reality that merging firms usually have disparate work environments, values, and procedures.

Job Security

Employees' fears of losing their jobs or dealing with events that could make their roles unstable add to their stress.

Prioritizing self-protection

Prioritizing self-protection also creates stress in the workplace. In fact, When employees are uncertain about their future, they may prioritize self-protection. This could entail withholding information, avoiding collaboration, or prioritizing self-preservation over teamwork. This behavior can destroy team trust and collaboration, creating a tense, competitive environment.

Increased Workloads and Responsibilities

M&As frequently result in organizational restructuring, which can lead to changes in job responsibilities and increased workloads. Employees may be assigned greater duties, without the appropriate support or resources. This can lead to fatigue, dissatisfaction, and stress as they attempt to reach increased standards.

Future

Stress is increased by worries about the M&A's long-term effects, such as job opportunities, business stability, and personal development. In fact, employees are apprehensive about their future in the merged organization. This includes concerns about career advancement, employment security, and the company's long-term viability. Uncertainty about the future can cause stress as employees attempt to plan their careers without knowing where the organization is headed.

Lack of Trust & Confidence

Employee stress can be exacerbated by a lack of trust in the leadership, procedure, or results, since employees may be concerned about their own futures or the prospects of the the company.

Impact on Career Progression

Employees are stressed about how the M&A would affect their career pathways, promotions, and professional development. In fact, will prospects for advancement or professional growth be limited or eliminated? Will the newly formed business value their expertise and experience? These questions can be stressful for employees as they think about their future careers.

Approval Delays

Employees who are concerned about their future due to delays in decision-making and approval processes during mergers and acquisitions may get frustrated and agitated. In fact, due to the complexity of integrating two firms, M&As can cause delays in decision-making and approvals. These delays can cause a bottleneck in operations, leaving staff in a state of limbo, unable to progress with projects or make choices. The uncertainty and waiting phase can be difficult.

Communication Gaps

Though it has slightly less impact than the other elements, poor communication throughout the M&A process can lead to miscommunications, gossip, and increased stress. In fact, effective communication is critical during a merger and acquisition to keep staff informed and motivated. However, communication breakdowns can result in rumors, misunderstandings, and worry. Employees may feel disconnected or unsure of what is going on, which can increase stress.

These factors represent the main pressures that workers experience during mergers and acquisitions. Direct, observable changes (such as leadership and salary) are linked to the highest levels of stress, whereas more general, abstract worries (such as cultural changes and future-related anxiety) are ranked lower. Proactively addressing these variables can reduce stress and increase the M&As practices' success.

Discussion

M&As practices can benefit the companies involved in a number of ways, including their employees, shareholders, and occasionally even their customers. However, they also create stress for employees involved in merged companies.

Changes to compensation and benefits are one of the key factors that create employee stress in M&As practices. Compensation and benefits are essential to a worker's motivation and sense of security. Any adjustments made to pay, bonuses, healthcare, retirement plans, or other benefits during M&As may have a direct impact on an employee's standard of living. There is a great deal of tension because it is unclear if these benefits will increase, remain the same, or decrease. Workers' financial stability and quality of life are strongly impacted by their fears of losing their jobs or having their benefits cut. Since most employees view salary as a crucial factor, any possible adjustments are sure to cause the greatest amount of worry and anxiety.

Another factor that significantly affects the workplace and job security is leadership. Employee unease and concerns about their position in the new structure can result from a change in leadership. Another factor is leadership, which has a profound influence on the work environment and job security. A change in leadership can unsettle employees, making them worried about their place in the new structure. A change in leadership frequently signifies a change in the operational priorities, corporate culture, and strategic direction. Workers who felt at ease under the former leadership may be concerned about whether the incoming leaders will respect their contributions, support their duties, or share their moral principles both personally and professionally. Employees may also be fearful of losing a mentor or boss who has been supportive, which might leave them unsure about their futures in the organization.

Almost everyone experiences fear and uncertainty during M&A transactions. Even while the real changes may not be as drastic as expected, it still produces a great deal of stress for employees to not know what is going to happen. In fact, there are a lot of unknowns associated with M&As by nature, including the company's future course, possible layoffs, and employment position changes. Because they are left wondering about their future without definitive answers, employees may develop a pervasive sense of anxiety as a result of this ambiguity. Fear of the unknown makes workers feel helpless and ill-prepared for what's ahead, which can make the transition itself less stressful.

Cultural shifts are also one of the realities in M&As practices. The cultures of the two merging companies must coexist. If the organizations have distinct work styles, values, or management practices, this could be difficult. Workers could be concerned about losing the good parts of their existing culture or about having to adjust to strange new conventions. If cultural differences are not handled with care, they can cause conflicts, misunderstandings, and a feeling of alienation. Likewise, the possibility of employment cuts is one of the most prevalent concerns during M&As. Workers could be afraid of being fired, demoted, or having their position drastically changed or removed. An employee's livelihood is directly threatened by a threat to their job security, which makes it a major source of stress. In fact, employees experience ongoing underlying stress throughout M&As due to the prospect of losing their jobs or having them dramatically changed.

Prioritizing self-protection is also one of the realities in M&As practices. Employees may put their own safety first in a situation where they are unsure about their future. This might be keeping knowledge to oneself, avoiding cooperation, or prioritizing self-preservation over teamwork. This kind of behavior can undermine teamwork and trust, creating a tense, competitive environment.

Organizational restructuring brought about by M&As frequently results in a shift in job responsibilities and an increase in workloads. Workers may be assigned more tasks, sometimes without the assistance or resources they require. As they try to live up to the heightened standards, this might cause fatigue, dissatisfaction, and stress.

Furthermore, concerns regarding their future in the merged business are held by the employees. Concerns regarding long-term business viability, employment security, and career advancement fall under this category. When workers attempt to plan their careers without having a clear understanding of the company's direction, uncertainty about the future can cause stress. There may be the possibility of a lack of trust and confidence in the merged company. Stress levels can rise when there is a lack of faith or confidence in the M&A process, leadership, or communication. Employees may experience insecurity and disengagement if they don't believe that the merger is in their best interests or that the leadership is transparently making decisions. M&As practice can have an impact on employee career progression. Employees' desire to advance in their careers is a major source of motivation, and ambiguity in this regard can be extremely stressful, especially for those with high aspirations. In fact, when workers think about their future career prospects, these considerations can be stressful.

Moreover, because merging two organizations is complex, there may be delays in decision-making and approvals during M&As. Employees may find themselves in a situation where they are unable to proceed with projects or make decisions due to operational bottlenecks caused by these delays. The waiting game and its uncertainty may be quite stressful. Finally, effective communication is essential during a merger or acquisition to preserve staff engagement and knowledge. Conversely, a communication breakdown can lead to stress, rumors, and inaccurate information. If employees believe they are unaware of the situation or are confused about it, they may become more stressed.

Conclusion

M&As practices are widely regarded as a transitory phase in organizational existence. As a result of this transitory period, changes in organizational culture, policies, and practices may occur, causing uncertainty about the job and job-related concerns. Following M&A operations, employees in the new firm experience job stress due to the uncertainty. It's a common thing that when people experience individual concerns with job insecurity at work, they raise job stress. This could happen because, following M&As practices, every employee should be more competitive within the merged (i.e. large) firm to perform better in the market, which eventually trickles down to the employees. They should address their issues so that they can feel safe at the new company. Thus, M&As activities may have resulted in greater job stress for employees at the new company.

In fact, if employees perceive unfair practices in performance management systems and information security regulations in a new organization, they will experience increased workplace stress. This could happen because, following M&As processes, and each new firm must adjust and reform employee remuneration rules and performance management policies in order to manage human resources cost-effectively. This causes significant changes in the new company's policies and procedures that directly affect employees, resulting in an increase in job stress.

Moreover, if employees are unable to obtain critical information regarding their organizational position in the new company, their job stress increases. This could happen because following an M&A, employees' corresponding duties and responsibilities shift, and if there is no effective flow of necessary information regarding their job positions and job assignments; it increases their job stress in the new firm. Furthermore, employees' employment stress levels rise when they struggle to adapt to a new corporate culture, organizational change, or a lack of understanding at the new firm. This could be because the new business will be developed with the new corporate culture following the merger and acquisition procedure. Changes to organizational hierarchy and structure will occur. Similarly, the flow of information in the form of new communication systems may alter, affecting employees' work lives in terms of changes in the workplace, job position, working groups, and route of information and its availability. This causes significant changes in employees' lifestyles, routines, and work behaviors, increasing job stress levels in the new companies. Indeed, as

a result of M&As practices, employees may experience a variety of psychological issues such as uncertainty, job insecurity, job changes, and the potential of job loss, all of which contribute to job stress. At the same time, work culture changes, changes in technology, work assignments, working hours, communication systems, relationships with new company leadership, managers and employees, changes in supervision styles, information gaps, new work behavior, and new organizational structure all contribute to increased job stress after M&A.

Some red flags indicate that M&As practices make work more challenging for employees. They include talented workers and outstanding workers leaving the company, executives and HR managers receiving greater amounts of internal grievances, employees taking more sick leave than usual, people working longer hours to compensate for interruptions, and an increasingly stressful workplace environment. Therefore, new companies need to focus on minimizing such negative effects of M&As practices. Creating an effective communication system, launching a change management program, leading employees with empathy, energizing them through positive engagement, monitoring how employees feel and using their feedback to improve the transition, identifying those who are struggling and assisting them in adapting are some of the ways that new firms can reduce employee stress following M&A practices. Employee job stress can be reduced by encouraging employees to participate in productive work and maintaining strong motivation and commitment levels. Unmanaged cultural differences can lead to miscommunications and misunderstandings, causing job stress among personnel. Employee interaction, mentoring and peer support, employee well-being, key staff retention, and cultural integration are the most crucial HR initiatives for effective M&As incorporation. All of these will assist in decreasing job stress among employees as a result of the M&As practices.

Limitations

This study has some limitations. It may be difficult to ensure that the sample consists of employees from various backgrounds, roles, and levels. Furthermore, some people might have given responses that reflect their perceived expectations rather than their true viewpoints. Cultural views on authority, uncertainty, and work frequently impact how stress is perceived. Applying broad stress theories without taking local

context into account may be challenging due to cultural quirks in Nepalese society that may affect employees' stress reactions. Economic or regulatory changes could affect Nepal's banking industry, affecting employee stress levels outside of M&A. M&A's effects may be difficult to separate from those of other outside stressors. The results of this study, which focuses on banks and financial institutions in Nepal, may not apply to other industries or areas where employee expectations, regulatory frameworks, and organizational cultures vary.

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Original Research Article

Factor Affecting Corporate Governance In Nepalese Telecommunication Sector

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Abstract

This study has been designed to extract the factors affecting corporate governance in the Nepalese telecommunication sector. The study aims to explore the impact of ownership structure, board leadership, board diversity, political influence, globalization, and technology on corporate governance. Employing a descriptive and explanatory research design, the study adopts a quantitative approach, utilizing a descriptive research design to gather data from 155 respondents. The study also utilizes a stratified-sampling technique to select its sample. Correlation and regression analyses were conducted to evaluate the relationship between independent and dependent variables. This research investigates the factors influencing corporate governance in the Nepalese telecommunication sector, potentially supporting the implementation of effective corporate governance practices within Nepal's Telecommunication industry. The study reveals significant relationships between ownership structure, board leadership, board diversity, political influence, globalization, technology, and corporate governance. Notably, ownership structure has a negative impact on corporate governance. This analysis contributes to improving firm performance by analyzing the factors affecting

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corporate governance and sheds light on the relative impact of those factors on corporate governance in the Nepalese telecommunication sector.

Keywords: *Corporate Governance, Globalization, Inclusive Board Structure, Political Influence, Technology*

Introduction

Corporate governance is fundamental to ensuring transparency, accountability, and ethical conduct in organizations. Within the Nepalese telecommunication sector, the need for effective governance mechanisms is particularly vital due to the industry's critical role in the country's economic progress and service provision (OECD, 2004). Nepal, a developing nation with a transitioning economy, relies heavily on its telecommunication sector to foster growth. However, enterprises in this sector face a complex set of challenges shaped by political influences, regulatory issues, and dynamic market conditions (Thorne et al., 2011).

Effective corporate governance is essential for mitigating risks, optimizing operational performance, and maintaining public trust. Political interference in the telecommunication sector often leads to undue influence on decision-making, which can hinder the implementation of best governance practices. Additionally, the concentration of ownership, especially by government entities, can cause conflicts of interest, reducing accountability and independence in governance structures (Mallin, 2016). The composition and leadership of boards are critical to steering companies toward long-term growth, yet challenges such as inadequate board diversity and independence persist, impacting governance outcomes (Carter et al., 2003).

While regulatory frameworks for corporate governance exist in Nepal, enforcement and adaptability to the evolving market landscape remain problematic (Mallin, 2016). The rapid technological changes in the sector demand governance mechanisms that can keep pace with innovations. However, issues such as inadequate technological infrastructure and low digital literacy further complicate the adoption of modern governance practices (Boubaker, et al., 2018).

Despite these challenges, ongoing efforts aim to improve governance in the Nepalese telecommunication sector. Regulatory reforms are being considered to enhance compliance, accountability, and transparency. Moreover, initiatives to improve board independence, competence, and diversity are being implemented to ensure

more effective governance (Clarke, 2017). Technological investments to improve governance systems are also being made, while stakeholder engagement efforts are becoming more common to ensure organizational accountability (OECD, 2004).

Corporate governance has emerged as a serious factor in improving a firm's overall performance, contributing to increased economic value, enhanced productivity, and reduced risks (Shleifer & Vishny, 1997). It ensures that organizations adhere to ethical conduct, transparency, and accountability, which are crucial for maintaining public trust and enhancing investor confidence. However, in developing countries like Nepal, the implementation of effective corporate governance practices, particularly in key sectors such as telecommunications, is still in its formative stages. Despite global recognition of the importance of corporate governance, the telecommunication sector in Nepal continues to face challenges stemming from political interference, ownership concentration, and ineffective regulatory frameworks (Pradhan & Adhikari, 2022).

Corporate governance is essential not only for international investors but also for domestic investors, who often face heightened risks in environments with poor governance structures. Unlike international investors, who can diversify risk, domestic investors remain more vulnerable to governance failures due to the lack of transparency and accountability in corporate practices. The principal-agent theory, as discussed by Jensen & Meckling, underscores the importance of governance mechanisms such as ownership structure, board composition, and managerial incentives to mitigate conflicts of interest among management and shareholders. In this context, understanding the role of governance mechanisms in Nepal's telecommunication sector is vital to safeguarding investor interests and improving corporate performance.

Empirical research in Nepal has highlighted the challenges posed by political influence, board diversity, and globalization in implementing sound governance practices (Poudel & Hovey, 2013). In particular, the ownership structure in Nepalese telecommunications, often dominated by government entities, complicates governance dynamics, leading to conflicts of interest, lack of board independence, and reduced accountability. This research seeks to explore these dynamics further, assessing how factors like ownership structure, board leadership, political influence, globalization, and technology affect corporate governance within Nepal's telecommunication sector.

Technology, while offering opportunities for enhancing governance practices, presents its own challenges. The adoption of modern governance mechanisms

depends on robust technological infrastructure and digital literacy, areas in which Nepal lags behind. Studies have shown that insufficient technology adoption can impede transparency, communication, and governance efficiency, undermining efforts to strengthen corporate governance (Poudel & Hovey, 2013). Furthermore, while regulatory frameworks exist, they often lack the enforcement necessary to ensure compliance, leaving gaps that can be exploited to the detriment of the organization and its stakeholders. Employee participation is increasingly recognized as a factor that can influence the effectiveness of governance within organizations. When employees are engaged in governance, organizations often see improvements in both compliance with regulations and overall organizational performance. However, in Nepalese telecommunication organizations, employees often remain on the periphery of governance discussions, despite being significantly affected by governance decisions. Present study is seeks to address the following objectives:

- To identify key corporate governance factors in the Nepalese telecommunications sector.
- To analyze the interrelationships among corporate governance factors within the sector.
- To examine the factors that impact corporate governance practices in the Nepalese telecommunications industry.

Literature Review

Corporate governance is increasingly recognized for its critical role in firm performance, with various theories offering different perspectives on governance dynamics. Agency theory (Jensen & Meckling, 1976; Fama, 1980) highlights conflicts between owners and managers, suggesting governance mechanisms to align interests and reduce agency costs. In contrast, stewardship theory (Donaldson, 1990) argues that managers are trustworthy stewards, with inside directors better positioned to make superior decisions that enhance corporate performance. Stakeholder theory (Freeman, 1984) emphasizes the firm's accountability to a wide range of stakeholders, focusing on balancing interests in decision-making processes. Finally, resource dependency theory (Hillman et al., 2000) views directors as vital in securing external resources necessary for firm success, emphasizing their role in providing information, skills, and connections to critical external parties. Collectively, these theories offer an all-

encompassing framework for grasping the intricacies of corporate governance.

Corporate governance has added prominence due to its critical role in enhancing organizational performance and protecting stakeholders' interests (Love, 2011). Studies like Bernard, et al., (2018). highlight its impact on employee job satisfaction in telecommunication sector, emphasizing that employees are vital assets whose commitment drives organizational success. Effective governance fosters corporate conscience, guiding behavior towards positive outcomes (Parker, 2007). High-profile scandals, including Enron and Wells Fargo, have spurred reevaluation of governance principles, particularly regarding board effectiveness and independent oversight (Williamson, 1985). Governance models vary, with the Continental-European model advocating for shareholder participation in management (Nestor & Thompson, 2000). Research underscores the necessity of good corporate governance in facilitating Corporate Social Responsibility (CSR) and improving financial performance (Utama, & Utama, 2014; Juniarti & Sentosa, 2009), while changes in board structures are aimed at minimizing agency costs (Sinaga et al., 2022). In emerging economies, corporate governance structures significantly influence environmental disclosures, reflecting growing awareness of climate issues (Gerged, 2021). Overall, effective corporate governance enhances stakeholder value, driving positive financial performance and fostering societal welfare (Dang et al., 2020; Napitupulu et al., 2020).

The studies reviewed provide a comprehensive understanding of how CG influences various dimensions of organizational performance, including firm value, environmental responsibility, employee satisfaction, and financial decision-making. Wahidahwati and Ardini, (2023) reveals that good corporate governance (GCG) significantly enhances firm value, primarily through its direct effects, which surpass the mediated impact via corporate social responsibility (CSR). This highlights the essential role of GCG in shaping firm performance, suggesting that companies prioritizing governance can achieve better financial outcomes. The use of financial and nonfinancial measure for performance can add the value for maintaining corporate governance in Nepalese telecommunications however the financial measure has more significant use and rank than the non-financial measure (Adhikari, & Chalise, 2021).

Harianja and Sinaga, (2022) further emphasize the intricacies of CG by examining its implications for accounting information quality. Their findings indicate that while increased institutional ownership may paradoxically lead to lower

governance quality, a greater presence of independent board members fosters better governance practices. This correlation suggests that board composition is crucial for effective governance, reinforcing Wahidahwati's assertion that governance structures directly affect firm valuation.

The intersection of corporate governance and environmental accountability is also critical, as indicated by Gerged, (2021). who calls for stronger integration of governance with environmental regulations in Jordanian firms. This need for concerted efforts in governance aligns with the findings of Gul, et al., (2020), posits that effective governance mechanisms in telecommunications sector facilitate greater engagement in Corporate Social Responsibility (CSR) activities. Together, these studies underscore the notion that robust governance frameworks are vital for enhancing CSR and environmental performance.

The disclosure practices of companies, revealing that larger firms do not necessarily provide more extensive CSR disclosures. This suggests that mere size and profitability do not guarantee effective communication of social responsibility efforts, echoing the findings of Nmai and Delle, (2014) that highlights that good corporate governance positively predicts employee job satisfaction in telecommunications sector. This correlation indicates that strong governance not only influences external perceptions through CSR but also enhances internal stakeholder satisfaction, thus promoting a healthier organizational culture.

The influence of corporate governance extends into the financial domain, as demonstrated by Pradhan et al., (2020) board size and ownership structures that directly impact banks' financial performance, while Pradhan emphasizes the inverse association between the digit of executive directors and non-performing loans. These findings illustrate the complex dynamics between governance structures and financial outcomes, reinforcing the necessity for optimal governance practices to dull risks and improve performance.

Olaifa and Ajagbe (2015) contribute to the understanding of governance in the banking sector by establishing that larger board sizes can detrimentally affect financial decisions. This notion of governance complexity is echoed in Nwafor, (2017). who advocate for stronger alliances among state-owned enterprises in Nigeria to enhance governance effectiveness and cost efficiency.

The collective findings from these studies illustrate a clear nexus between

corporate governance and various organizational outcomes, ranging from financial performance to social responsibility. The emphasis on the quality and structure of governance mechanisms is critical for fostering sustainable business practices, enhancing stakeholder satisfaction, and ultimately improving firm value. As organizations navigate an increasingly complex business environment, the integration of effective governance practices remains imperative for achieving long-term success.

Research Methodology

The aim of this study was to identify the factors affecting corporate governance in the telecommunications sector of Nepal. A descriptive research design was employed to meet the research objectives, and data were collected through a structured questionnaire distributed to the respondents. The study employed analytical tools such as mean, standard deviation, correlation, and regression analysis to derive insights from the collected data. The mean was used to provide a central tendency of the responses, Standard deviation measuring the variability of the responses, highlighting how consistently participants viewed the various factors influencing corporate governance. Correlation analysis assessed the strength and direction of relationships between different variables. The population consisted of all employees working in the Nepalese telecommunications industry. However, employees from Nepal Telecom and NCEE, the two largest telecommunications companies in Nepal, were selected as the sample frame for the study. Given the large population size, which is approximately 155 employees, Roscoe's (1975) rule of thumb for minimum sample size indicated that a sample size of at least 120 was sufficient for unknown populations. Thus, a total sample size of 155 was collected. The convenience sampling method was employed, supplemented by random sampling techniques, to select participants from the Nepalese telecommunications sector. This study was based on primary data gathered through a structured questionnaire related to the factors influencing corporate governance. The questionnaire comprised structured items, including multiple-choice questions using Likert scale. The measurement instruments were developed based on existing literature, including the measurement of political influence using a five-point Likert scale questionnaire as indicated in

Table 1

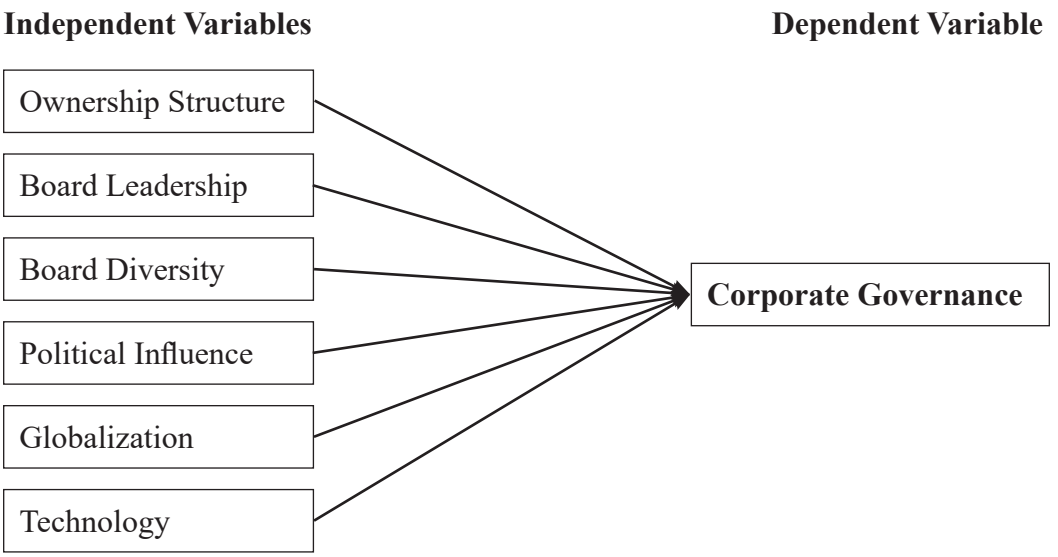
Measurement of Variables

Variables	Source of items
Political influence	Barth, et al., 2001; McCarthy & Puffer, 2003; Saidi, 2004.
Globalization	Gugler, et al., 2004.
Technology	Thorne et al., 2010.
Ownership	Shliefer & Vishny, 1997.
Board Leadership	Kula, (2005).
Board Diversity	Carter, et al., 2003; Kang, et al., 2007, Erhardt, et al., 2003.
Corporate Governance	OECD, 2004; Thorne, et al., 2010

The conceptual framework for the study was developed from the past empirical works by highlighting the various factors that have impact on corporate governance. The research framework in figure 1 has been established in which the present study is based.

Figure 1

Research Framework



To explore these relationships further, a regression model has been developed to quantitatively test the influence of specific independent variables on corporate governance, allowing for the estimation of how changes in these factors could predict

changes in governance outcomes. The regression model is developed as.

$$Y= a + \beta X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + ei$$

Where,

Y = Corporate Governance
X_1 = Ownership structure
X_2 = Board leadership
X_3 = Board Diversity
X_4 = Political influence
X_5 = Globalization
X_6 = Technology
a = Constant
ei = Error term

Reliability Analysis

To decide the reliability of the variables being measured in this questionnaire, Cronbach's Alpha (α) was conducted on a subset of items taken for the study. The Cronbach's Alpha was used to assess the quality and consistency of the survey.

Table 2

Reliability statistics of items under each variables under study

Variable	No. of Items	Cronbach's Alpha
Ownership Structure	5	0.890
Board Leadership	6	0.875
Board Diversity	5	0.835
Political Influence	5	0.730
Globalization	6	0.854
Technology	5	0.866
Corporate Governance	8	0.758

Table 2 shows the Cronbach 's alpha coefficients of independent variables Ownership structure, Board leadership, Board Diversity, Political influence, Globalization, Technology and dependent variable corporate governance. It is generally linked to internal consistency, with values ranging from 0 to 1. According to Sekaran (2000),

a Cronbach's Alpha coefficient below 0.6 is deemed "poor," between 0.6 and 0.8 is considered "acceptable," and above 0.8 is regarded as "good." Here, Cronbach‘s Alpha of all variable is between 0.7 to 0.8 so they are acceptable. Therefore, the instruments used in this research are considered to be reliable.

Results and Discussion

Demographic profile

Table 3 provides an overview of the respondents' demographic profile, covering variables such as gender, age group, academic qualification, position, and experience. The majority of the respondents are male, making up 64.5% of the sample, while females account for 35.5%. The largest age group is 31-40 years, representing 43% of the respondents, followed by the 41-50 age group at 32%, and those below 30 at 18%, with the smallest group being those above 50 at 7%.

Table 3

Respondent’s profile

Demographic variable		No. of Respondents	Percentage
Gender	Male	100	64.5%
	Female	55	35.5%
Age group	below 30	27	18%
	31-40	67	43%
	41-50	50	32%
	50 above	11	7%
Academic qualification	Intermediate	2	1.3%
	Bachelor	55	35.5%
	Master and above	98	33.2%
Position	Executive	5	3.2%
	Manager	60	38.7%
	Officer	90	58.1%
Experience	Less than 5 Year	9	5.4%
	5-10	70	45.5%
	11-15	69	45%
	16 and above	7	4.1%

Source: Field Survey, 2024

In terms of academic qualification, most respondents (63.2%) hold at least a bachelor's degree, with 35.5% having completed their bachelor's, and 33.2% holding a master's degree or higher. Only 1.3% of respondents have an intermediate-level qualification. Regarding their positions within the organization, the majority are officers (58.1%), followed by managers (38.7%), with only 3.2% of the respondents holding executive roles. As for work experience, the majority have between 5-10 years (45.5%) or 11-15 years (45%) of experience, while a smaller percentage (5.4%) have less than 5 years, and only 4.1% have more than 16 years of experience. This demographic profile reflects a workforce that is predominantly experienced and educated, with most respondents occupying officer or managerial roles.

Descriptive statistics

Table 4 provides the descriptive statistics for seven constructs relevant to corporate governance in the study: Ownership Structure, Board Leadership, Board Diversity, Political Influence, Globalization, Technology, and Corporate Governance. Each of these constructs was assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 4

Descriptive statistics

Constructs	Minimum	Maximum	Mean	Std. Deviation
Ownership structure	1	5	3.76	1.132
Board Leadership	1	5	3.67	1.121
Board Diversity	1	5	3.65	1.064
Political Influence	1	5	3.63	1.043
Globalization	1	5	3.62	1.253
Technology	1	5	3.67	1.231
Corporate Governance	1	5	3.67	1.231

Source: Field Survey, 2024

The mean values for all constructs range between 3.62 and 3.76, indicating that respondents generally agree on the importance of these factors in corporate governance. Ownership Structure holds the highest mean of 3.76, reflecting the respondents' strong recognition of its relevance. Board Leadership, Technology, and Corporate Governance

share a mean of 3.67, suggesting that these constructs are also perceived as significant by the respondents.

The standard deviations, which measure the variability of responses, range from 1.043 to 1.253. Political Influence has the lowest standard deviation (1.043), indicating more consistent views among respondents, while Globalization shows the highest standard deviation (1.253), suggesting a broader range of perceptions regarding its impact on corporate governance. Both Technology and Corporate Governance exhibit moderate variability, with identical standard deviations of 1.231, highlighting some diversity in how respondents perceive their role.

These statistics suggest that respondents generally agree on the importance of these constructs, though there is some variation in how strongly they view factors like Globalization and Technology.

Correlation analysis

Table 5 presents the statistical tests used to identify factors influencing corporate governance in Nepal's telecommunication sector. The Pearson correlation test was used to measure the strength and direction of relationships between variables. A positive correlation means the variables move in the same direction, while a negative correlation means they move in opposite directions.

Table 5

Correlation Analysis

Variables	OS	BL	BD	PI	GL	TE	CG
OS	1	.490**	.238**	.790**	.145*	0.071	.170*
BL		1	.214**	.359**	-0.003	.208**	.226**
BD			1	.180**	.230**	.156*	.281**
PI				1	0.124	0.08	.158*
GL					1	.596**	.548**
TE						1	.580**
CG							1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Data Analysis

The correlation analysis reveals that ownership structure (0.170), board leadership (0.226), board diversity (0.281), political influence (0.158), globalization (0.548), and technology (0.580) all have significant positive relationships with corporate governance. This means that as these factors increase, corporate governance improves, with globalization and technology showing the strongest correlations. Technology is also positively correlated with board leadership (0.208), board diversity (0.156), and globalization (0.596), but not significantly with ownership structure or political influence. Additionally, ownership structure has a positive correlation with globalization (0.145), while board leadership, board diversity, and political influence do not. Finally, ownership structure (0.790), board leadership (0.359), and board diversity (0.180) are positively correlated with political influence.

Regression Analysis

Regression analysis is a key statistical method used to explore and quantify the extent of effect between a dependent variable and one or more independent variables. Unlike correlation analysis, which only identifies the strength of the relationship between two variables, regression analysis investigates deeper by explaining how one variable affects another. In this study, regression analysis was used to test hypotheses and determine which factors (ownership structure, board leadership, board diversity, political influence, globalization, and technology) significantly influence corporate governance. Linear regression, chosen for its simplicity and widespread use, helped explain how much variability in corporate governance can be attributed to these independent variables and identify which variables have the most significant impact.

Table 6

Regression Result

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.667	2.117		1.733	.085
Ownership Structure	-.033	.118	-.026	-.280	.030
Board Leadership	.187	.132	.104	1.418	.008
Board Diversity	.164	.072	.128	2.286	.023
Political Influence	.059	.104	.048	.564	.003
Globalization	.307	.099	.243	3.115	.002
Technology	.387	.084	.318	4.607	.000

a. Dependent Variable: CG

R^2= 0.562, F=17.067, Sig= .000

The regression analysis results from Table 6 highlight the effects between corporate governance (CG) and independent variables: ownership structure, board leadership, board diversity, political influence, globalization, and technology. The model shows that these variables collectively explain a significant portion of the variability in corporate governance, as indicated by the R^2 value of 0.562. This means that 56.2% of the changes in corporate governance can be attributed to the independent variables in the model. Furthermore, the F-value of 17.067 and a p-value of 0.000 show that the overall model is statistically significant, making it a reliable tool for understanding how these factors impact corporate governance.

Ownership structure has a coefficient of -0.033 with a significance level of 0.030. This suggests a small but statistically significant negative relationship between ownership structure and corporate governance, meaning that as ownership structure changes, it may negatively affect corporate governance, though the impact is minimal. Board leadership demonstrates a positive impact with corporate governance, as indicated by its coefficient of 0.187 and significance level of 0.008. Similarly, board diversity has a positive and significant effect on corporate governance, with a coefficient of 0.164 and a p-value of 0.023. Political influence, with a coefficient of 0.059 and a significance level of 0.003, also has a positive impact on corporate governance, though smaller than

the other factors. Globalization exhibits a strong positive relationship with corporate governance, with a coefficient of 0.307 and a p-value of 0.002. Finally, technology has the strongest positive impact on corporate governance, with a coefficient of 0.387 and a highly significant p-value of 0.000.

Table 7

Summarized Hypothesis Result

Hypothesis	Conclusion
Ownership structure	Accepted
Board Leadership	Accepted
Board Diversity	Accepted
Political influence	Accepted
Globalization	Accepted
Technology	Accepted

Source: Data Analysis

There is a strong connection between effective corporate governance and enhanced social information disclosure and organizations with better governance frameworks are more likely to disclose social information transparently, fostering greater accountability and stakeholder trust (Lamsal, 2021). The study found that ownership structure has a small but statistically significant negative effect on corporate governance, suggesting that concentrated ownership or a lack of shareholder diversity may hinder effective governance practices. This finding is consistent with the existing literature, which highlights that concentrated ownership can create conflicts of interest and diminish accountability, ultimately leading to weaker governance outcomes (Shleifer & Vishny, 1997; Bebchuk et al., 2009). In contrast, the study revealed a positive impact of board leadership on corporate governance, aligning with previous research that emphasizes the critical role of effective leadership in enhancing governance practices. Strong leadership can facilitate better oversight and strategic decision-making, ultimately contributing to improved governance outcomes (Carter et al., 2003). This finding reinforces the argument that competent board leadership is vital for the success of governance frameworks.

Furthermore, the study indicated that board diversity positively influences

corporate governance. This result is consistent with literature that demonstrates how diverse boards bring a variety of perspectives and experiences, which can lead to better decision-making and oversight (Adams & Ferreira, 2009). Enhanced board diversity is often associated with increased creativity and innovation, ultimately benefiting corporate governance. The analysis also showed a positive relationship between political influence and corporate governance. While the impact of political factors is relatively smaller, the finding is consistent with the view that regulatory frameworks and political affiliations can shape governance practices (Ramdani & Witteloostuijn, 2010). Organizations operating in politically influenced environments must navigate these complexities to maintain effective governance. The study reveals smaller board size, a higher proportion of independent directors, reduced ownership concentration, enhanced transparency, and well-structured director compensation are crucial for improving governance and performance (G.C., 2019). Beeks and Brown (2006) find that firms with high-quality corporate governance enhance the informativeness of their disclosures, ensuring stakeholders have a clear, reliable, and timely view of the firm's operations and governance practices, which aligns with shareholders' interests.

Additionally, globalization was found to have a strong positive effect on corporate governance, consistent with research suggesting that exposure to global markets leads firms to adopt higher governance standards (Gugler & Gumbau-Brisa, 2004). This finding indicates that global practices and competition can enhance transparency and accountability, reinforcing the need for companies to align with international governance norms.The study identified technology as having the most substantial positive impact on corporate governance. This aligns with existing research indicating that advancements in technology improve communication, data analysis, and decision-making processes, thereby strengthening governance frameworks (Kraus & Brabete, 2018). Technology serves as a catalyst for enhancing governance practices by facilitating better information flow and transparency.

Conclusion and Implications

Present study concludes that there are several key factors influencing corporate governance in the Nepalese telecommunication sector. Ownership structure, particularly concentrated ownership or a lack of shareholder diversity, may have a negative impact on governance, hindering effective decision-making and oversight.

On the other hand, stronger and more effective board leadership plays a vital role in enhancing corporate governance, with competent leaders providing strategic direction and ensuring proper oversight.

Board diversity, in terms of gender, expertise, and background, is another positive contributor, as it brings a broader range of perspectives that lead to better decision-making and improved governance. Political factors, though having a relatively small influence, are still significant, emphasizing the importance of navigating political environments and adhering to regulatory frameworks for strong governance practices.

Globalization emerges as a major driver of improved governance, as exposure to global markets, competition, and international standards promotes greater transparency and accountability. Finally, advancements in technology have the most substantial positive impact on corporate governance, enabling better decision-making, monitoring, and transparency through the use of modern information systems and tools. Together, these factors underscore the multifaceted nature of corporate governance and the importance of fostering diverse leadership, global outlook, and technological innovation in improving governance practices.

Based on the findings of this study, several key implications are proposed for enhancing corporate governance in the Nepalese telecommunication sector and guiding future research. One critical recommendation is to increase the sample size in future research endeavors. A larger sample can enhance the generalizability and reliability of results, minimizing potential errors associated with limited data.

Moreover, employing a mixed-methods approach that combines quantitative surveys with qualitative interviews can provide deeper insights into the factors influencing corporate governance. This comprehensive strategy will facilitate a more nuanced understanding of the complexities involved in governance practices.

Additionally, it is crucial for corporations to focus on strengthening board independence. Appointing qualified independent directors can ensure effective oversight and strategic direction, thereby reinforcing governance frameworks. Furthermore, developing a strong ethical corporate culture through comprehensive codes of conduct and ethics training is essential for fostering integrity and accountability within organizations.

Future research should also explore the unique challenges facing corporate governance in Nepal by investigating the specific cultural, legal, and institutional

factors at play. Comparative studies that analyze successful governance models from countries with similar socio-economic conditions can provide valuable insights and lessons for Nepalese corporations.

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Original Research Article

Analysis of Government Expenditure on Private Sector Investment in Nepal: A Time Series Approach

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Abstract

This study examines the role of government expenditure on private sector investment in Nepal, utilizing a time-series approach. The research employs a quantitative methodology, analyzing 49 years of time-series data (1974/75-2022/23). The study uses the Autoregressive Distributed Lag (ARDL) model to explore both the long-run and short-run relationships between government expenditure and private investment. The dependent variable is private sector investment, while the independent variables include real GDP, government expenditure, foreign exchange rates, and the consumer price index (CPI). Unit root tests, the ARDL bounds test, and Granger causality tests were applied to analyze the data. The results indicate a significant positive long-run relationship between real GDP and private sector investment, while government expenditure shows mixed effects. Infrastructure-related government spending positively influences private investment, whereas non-infrastructure expenditure has a crowding-out effect. Inflation, represented by the CPI, has a negative impact on private sector investment, creating uncertainty and raising costs. The foreign exchange rate demonstrates a marginally

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significant positive effect on private investment. The findings align with previous research in developing countries where researchers observed the crowding-in effect of government spending on private investment. The role of inflation and foreign exchange stability was also highlighted as crucial for fostering a favorable investment environment.

Keywords: *Government expenditure, Private sector investment, ARDL model, Infrastructure spending, Inflation, Foreign exchange rate*

JEL Classification: C32, E31, F31, O53

Introduction

In the economic world, there are two contrasting views related to the impact of government expenditure and private sector investment on the economic growth of a nation. Neo-classical theorists argue that the decreased role of the private sector helps reduce inflation. In contrast, Keynesian theorists argue that there will be a multiplier effect in the economy when increased government expenditure increases the demand and thus increases economic growth (Kunwar, 2019). In a country like Nepal, where the government spending is mostly on non-infrastructure-related expenditure, it might have detrimental effects on the private sector's motivation to invest and generate economic activities.

Government expenditure refers to the spending by different levels of government in a nation to provide public services to the public and for the security, welfare, and overall benefits of the public. Government spending is one of the tools used by various nations to stimulate the economic activities in a nation thus increasing employment opportunities, improving the living standard of the people, etc. (Lahirushan and Gunasekara, 2015). A few years ago, during the COVID-19 pandemic as well, various nations increased their public spending manifold to stimulate the economy. The United States of America is among the nations that have higher government expenditure through various fiscal policy measures to stimulate the economy and increase private investment (Soyres, et al., 2024).

Government expenditure plays a crucial role in the economy of both developed and developing nations, and it has been used widely as one of the tools to overcome economic barriers. As compared to other fiscal policies, it has a direct impact on the economy by helping the government to overcome the cyclicality of the economy. However, the risks always lie that overspending by the government might lead to a high inflation rate, and both crowding in as well as crowding out effects might be

there depending upon the scenario (Nguyen, 2023). The crowding in and out of private investment differs as per the economic development of a country and the different components of the government spending.

In any nation, the level of income of the population is not the direct impact of the increased government expenditure but of the increased private investment (Mallick, 2016). When the government spends on different sectors for different purposes, it has both positive as well as negative impacts on private investment. Government expenditure on infrastructure-related activities might have a positive impact since it stimulates other auxiliary economic activities. On the contrary, expenditure by the government on non-infrastructure activities and welfare might hurt private investment.

The central question guiding this study is: does government expenditure affect private sector investment in Nepal? Different studies were conducted in Nepal revolving around the similar areas and questions; and this study aims to fill the gap in the research by analyzing larger data sets in a time series analysis and using different quantitative analysis models.

The overall objective of this study is to analyze the impact of government expenditure on private-sector investment in Nepal by studying the data of 49 years in a time-series analysis. Moreover, the study is also aimed at providing valuable insights into how Nepal's private investment reacts as compared to the level and composition of the government expenditure.

Literature Review

Nguyen (2023) found that the increased public expenditure has a dual effect on private investment i.e., it crowds out the private investment in developed countries. Whereas in the developing countries, increased government expenditure crowds in the private investment. The researcher observed data from 2002 to 2019 from 36 developed countries and 98 developing countries. Before generalizing the result in the Nepalese context, it is important to test the findings in the Nepalese context and adapt the findings accordingly.

In another study, researchers observed that a high level of government spending decreased the private sector investment in the economy. for example, when the government starts hiring more people, there are fewer people left with the private sector to start a business with and invest in. The private sector decreases its investment

in R&D, manufacturing, and other activities when government spending increases. The level of effect, of course, depends upon the type of government spending and the private firm; however, it hurts the private sector investment in the long run (Kim and Nguyen, 2020).

In the Indian context, (Mallick, 2016) published a working paper where it has been observed that government expenditure has both crowding-in and crowding-out relationship with private investment. When the government spends on non-infrastructure expenditures, the crowding-out relationship can be seen, and vice-versa. The ratio of infrastructure and non-infrastructure expenditure of the government in Nepal is on the higher side, and this finding might be relevant in the Nepalese context as well. However, a study for this effect to validate the findings is necessary before generally accepting the findings of the Indian economy.

Carvelli (2023) found that government expenditure has a crowding-out effect both in the short run and long run based on the time series data analysis of 28 OECD countries from 1990-2019 irrespective of the sources of financing of the government expenditure. Similarly, the expenditure by the government on the productive sector has a positive long-term impact on private investment, and vice-versa. Now, the findings, before adapting to the Nepalese context, need to be thoroughly tested and modified, and hence the present research is necessary to validate these findings in Nepal.

A study conducted in the Nigerian economy using the ARDL approach from 1981 to 2015 observed that there were both positive as well as negative effects of government spending on private investment. The effect depends upon the types and components of the government spending and concluded that the increase in the private sector investment in Nigeria depends upon the pattern and components of the government expenditure (Omitogun, 2018). It is therefore important to conduct a similar study in Nepal using a larger time series dataset is necessary to help the stakeholders make an informed decision and adapt the international findings in the Nepalese context.

Shrestha (2009) found that in Nepal the government expenditure on the physical infrastructure plays a very important role in enhancing economic growth by stimulating increased private sector investment. The role of government expenditure on physical infrastructure is productive in Nepal, which facilitates enhancing private sector engagement in other supporting economic activities as well as generating employment. The study was conducted by analyzing the data from 1981 to 2007 using

the OLS model. To further stretch and confirm the results is necessary by employing the larger data sets and different measurement models in the analysis process.

Methods and Materials

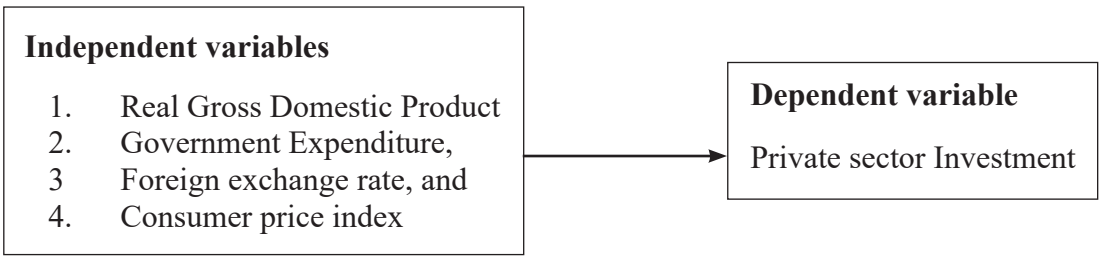
This quantitative study employs analytical and descriptive research designs. Secondary data were used to evaluate the impact of independent variables on the dependent variable. The data were analyzed and interpreted using EViews version 12. The investigation relies on secondary and time series data.

The study utilized 49 sets of time series data spanning from 1974/75 to 2022/23 to analyze the relationship between the dependent and independent variables. The dependent variable is Private Sector Investment, while the independent variables consist of the Real Gross Domestic Product, Government expenditure, Foreign exchange rate Nrs. to USD and Consumer price index.

Conceptual Framework, Model formulation and Study Variables

Figure 1

Relationship between Dependent and Independent Variables



The relationship between private sector investment (PSI) and its determinants can be expressed as:

$CPI_t = f(RGDP_t, GE_t, FER_t, CPI_t)$

The linear relationship between the variables is established by applying logarithms to both sides of the equation. This transformation enables the calculation of the elasticities of PSI relative to the explanatory variables.

$$\ln PSI_t = \beta_0 + \beta_1 \mathbf{t} + \boldsymbol{\beta}_2 \ln RGDP_t + \beta_3 \ln GE_t + \beta_4 \ln FER_t + \beta_5 \ln CPI_t + e_t$$

Where,

PSI = Private sector Investment

RGDP = Real Gross Domestic Product

GE = Government Expenditure

FER = Foreign exchange rate

CPI = Consumer price index (2014/15 = 100)

e_t = error term

β_i = constant coefficient

Sources of Data

This research used both descriptive and analytical methods and only used secondary data.

Table 1

Variables, Abbreviations, Units and Data Sources Used in Research

Variable names	Symbols	Units	Sources
Private sector Investment	PSI	% of GDP	QEB, 2024 Jan, NRB
Real Gross Domestic Product	RGDP	Nrs. in 10 Million	Economic Survey (Various issues)
Government Expenditure	GE	Nrs. in 10 Million	Economic Survey (Various issues)
Foreign exchange rate	FER	Nrs. to USD	QEB, 2024 Jan, NRB
Consumer Price Index	CPI	Base Year 2014/15=100	QEB, 2024 Jan, NRB

Econometric Method

For the time series method studies, the following procedures were used to test for the economic development:

Stationery Test

The majority of time series econometric techniques were built upon the assumption that the time series variables were stationary. Therefore, standard estimations and test procedures were applied in the dynamic time series model. As the first step, it was necessary to examine the stationary property of each series. The unit root test allowed us to determine the order of integration for each time series. To

proceed with the ARDL model, the time series needed to be integrated at either I(0) or I(1). Therefore, the ADF and P-P tests were used in this study to identify the order of integration.

ARDL Model

In the literature, the Engle-Granger (1987) and Johansen (1988) models are widely used for co-integration tests (Poudel, 2024). These models require variables to be stationary at I(1) and non-stationary at I(0) (Peseran et al., 2001). However, the Autoregressive Distributed Lag (ARDL) boundary test, as proposed by Pesaran and Shin (1995) and further developed by Pesaran et al. (2001), accommodates non-stationary series at the same level, making it possible to test for co-integration without determining the degree of integration. The ARDL approach offers several key advantages:

i. **Simplicity:** It allows for co-integration verification after determining the appropriate lag length, unlike the Johansen and Juselius (1990) methods.
ii. **Flexibility:** It does not require preliminary unit root testing, making it suitable for variables that are I(0) or I(1), but not I(2).
iii. **Efficiency:** It is effective even with small or limited sample sizes.

ARDL Bounds Test

The ARDL bounds test is used to identify long-run relationships between independent and dependent variables, offering several advantages over traditional cointegration tests (Johansen, 1991). This method involves determining whether the data are integrated at order zero, I(0), or order one, I(1). Once this is established, an error correction model (ECM) is employed for further analysis.

Error Correction Model (ECM)

The error correction representation of the Autoregressive Distributed Lag (ARDL) model captures the cointegration among variables and is analyzed through the ECM. The coefficients of the lagged values are utilized to examine short-run dynamics.

Granger Causality Test

The relationship between the variables was assessed using the Pairwise Granger Causality Test. In this test, if past values of variable x could predict future values of variable y, considering the past values of y, then x was said to Granger-cause y. A common method for testing Granger causality involved regressing y on its own

lagged values as well as the lagged values of x. The null hypothesis in this context was that the coefficients of the lagged values of x were all jointly zero. Rejecting this null hypothesis indicated that x does indeed Granger-cause y.

Results

Descriptive Statistics

The descriptive statistics reveal key insights into Nepal's economic environment over time. Table 2 shows descriptive statistics of variables used in research article.

Table 2

Descriptive Statistics

	LNPSI	LNRGDP	LNGE	LNFER	LNCPI
Mean	2.660677	6.776728	8.630998	3.803856	3.339630
Median	2.714961	6.815672	8.692473	4.170043	3.559224
Maximum	3.238678	7.746041	11.71679	4.870952	5.060314
Minimum	2.167406	5.833766	5.019727	2.351375	1.421761
Std. Dev.	0.291921	0.600619	1.980110	0.815322	1.128352
Skewness	-0.029441	-0.058498	-0.068752	-0.553942	-0.213850
Kurtosis	1.866550	1.768916	1.965983	1.819013	1.848156
Observations	49	49	49	49	49

Source: Author's calculations performed using E-Views

Private sector investment (LNPSI) shows moderate variability with near-symmetrical distribution, indicating stable investment patterns influenced by broader macroeconomic conditions. Real GDP (LNRGDP) reflects steady economic growth with some fluctuations, suggesting periods of expansion and contraction driven by both external shocks and domestic policies. Government expenditure (LNGE) exhibits high variability, signaling an active fiscal policy with increased spending during economic downturns or developmental phases. The foreign exchange rate (LNFER) shows significant fluctuations and negative skew, highlighting currency depreciation over time due to trade imbalances and external economic factors. Finally, the Consumer Price Index (LNCPI) reveals moderate inflation volatility, reflecting periods of both low and high inflation, likely influenced by domestic supply constraints and external price shocks. Together, these variables depict an economy that is responsive to both

internal and external factors, with fiscal policy and currency movements playing significant roles in shaping private sector investment and overall economic stability.

Table 3

Correlation Analysis

Correlation t-Statistic	LNPSI	LNRGDP	LNGE	LNFER	LNCPI
LNPSI	1.000000				
LNRGDP	0.923981	1.000000			
	16.56341				
LNGE	0.909243	0.995373	1.000000		
	14.97473	71.01500			
LNFER	0.901748	0.967375	0.961107	1.000000	
	14.30172	26.17744	23.85817		
LNCPI	0.913271	0.996808	0.995996	0.977765	1.000000
	15.37013	85.59801	76.38136	31.96488	

Source: Author's calculations performed using E-Views

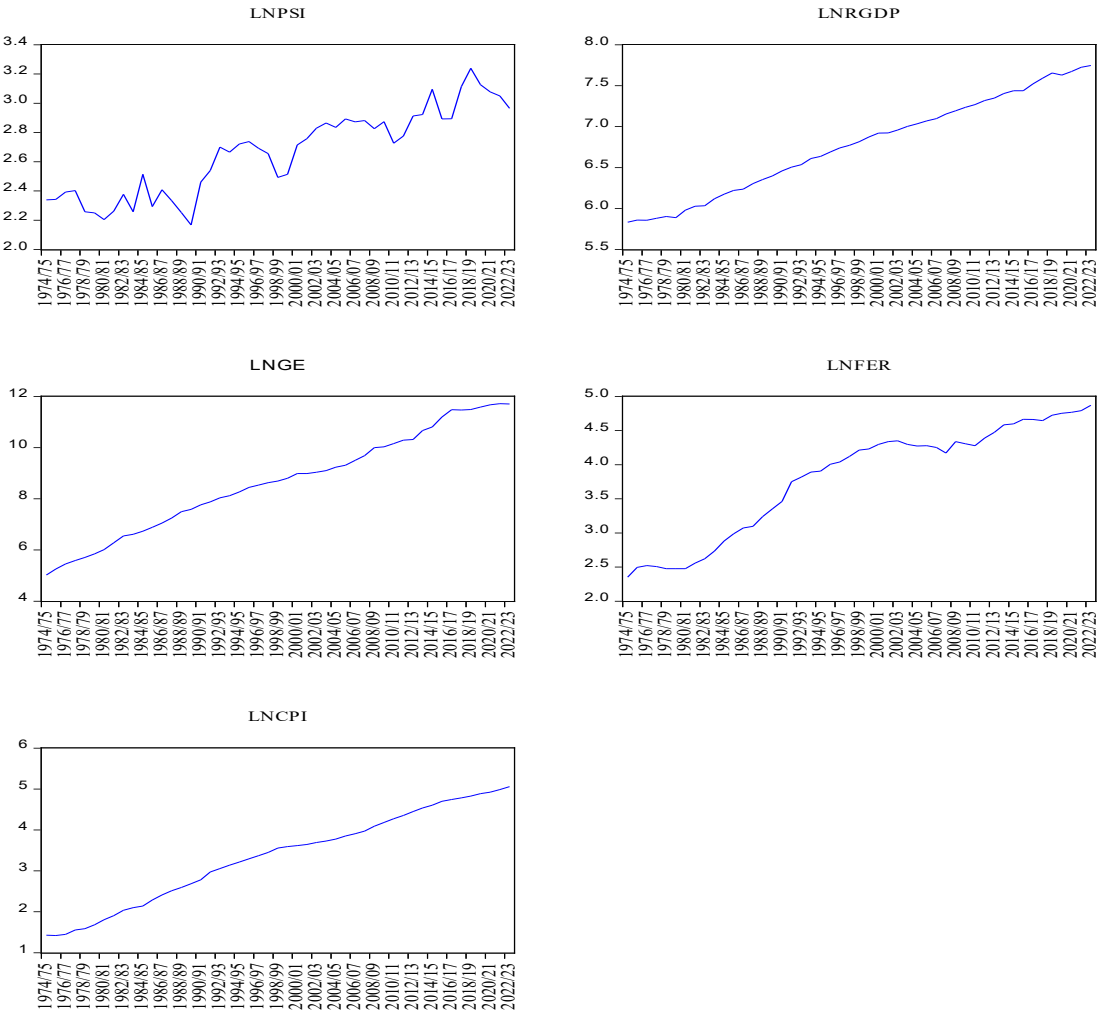
The correlation analysis reveals a strong interconnectedness between private sector investment (LNPSI) and key macroeconomic variables in Nepal. LNPSI shows a high positive correlation with real GDP (LNRGDP) at 0.92 (t-statistic = 16.56), indicating that economic growth significantly drives private sector investment. Similarly, government expenditure (LNGE) is highly correlated with LNPSI at 0.91 (t-statistic = 14.97), suggesting that fiscal policy plays a crucial role in stimulating investment. The foreign exchange rate (LNFER) also exhibits a strong positive correlation of 0.90 with LNPSI (t-statistic = 14.30), implying that currency movements impact investment, potentially through export competitiveness. Additionally, the correlation between inflation (LNCPI) and LNPSI is 0.91 (t-statistic = 15.37), indicating that moderate inflation may signal economic activity that encourages investment. The near-perfect correlations among LNRGDP, LNGE, and LNCPI (all above 0.96) highlight their interdependence, showing how fiscal policy and macroeconomic stability jointly influence investment behavior. The statistically significant t-values across these relationships further confirm the robustness of these associations.

Time Series Plots

The time series plots offer significant insights into the dynamics of Nepal's economic development. Figure 2 shows the time series plots of concern variables.

Figure 2

The time series plots



Source: Author's calculations performed using E-Views

Private sector investment (LNPSI) exhibits an upward trend, though marked by periods of volatility, potentially attributable to political instability and external shocks.

In contrast, real GDP (LNRGDP) displays a stable and consistent growth trajectory, reflecting sustained economic expansion over the period. Government expenditure (LNGE) aligns with this trend, indicating a proactive fiscal policy aimed at enhancing public infrastructure and social services. Foreign exchange rate (LNFER) show a steady accumulation, driven by rising remittances and export earnings, although intermittent declines suggest vulnerability to external imbalances. Lastly, the consumer price index (LNCPI) follows a persistent upward path, signaling ongoing inflationary pressures. These patterns highlight a growing economy tempered by fluctuations in private investment and inflation, underscoring the importance of prudent economic policies to foster long-term growth and macroeconomic stability.

Unit Root Testing

As shown in Table 2, the unit root test results from both the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) tests indicate that most variables are non-stationary at their level forms but become stationary at their first differences.

Table 4

Unit Root Test Results

UNIT ROOT TEST TABLE (PP)

At Level		LNPSI	LNRGDP	LNGE	LNFER	LNCPI
With Const.	t-Statistic	-1.1492	0.1508	-1.6290	-1.3959	-1.1551
	Prob.	***0.6886***	***0.9664***	***0.4602***	***0.5766***	***0.6862***
		no	no	no	no	no
With Const. & Trend	t-Statistic	-3.6737	-3.1063	-2.0971	-1.1322	-1.0419
	Prob.	***0.0340***	***0.1165***	***0.5342***	***0.9126***	***0.9281***
		**	no	no	no	no
At First Difference		d(LNPSI)	d(LNRGDP)	d(LNGE)	d(LNFER)	d(LNCPI)
With Const.	t-Statistic	-10.3159	-7.7849	-5.5252	-5.6162	-5.0907
	Prob.	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0001***
		***	***	***	***	***
With Const. & Trend	t-Statistic	-10.1422	-7.6931	-5.6545	-5.6345	-5.4133
	Prob.	***0.0000***	***0.0000***	***0.0001***	***0.0001***	***0.0003***

UNIT ROOT TEST TABLE (PP)

At Level		LNPSI	LNRGDP	LNGE	LNFER	LNCPI
		***	***	***	***	***

UNIT ROOT TEST TABLE (ADF)

At Level		LNPSI	LNRGDP	LNGE	LNFER	LNCPI
With Const.	t-Statistic	-1.3735	0.1185	-1.7162	-1.6272	-1.3986
	Prob.	***0.5874***	***0.9640***	***0.4169***	***0.4612***	***0.5753***
		no	no	no	no	no
With Const. & Trend	t-Statistic	-3.7916	-2.9860	-1.9689	-0.7608	-1.2898
	Prob.	***0.0256***	***0.1467***	***0.6030***	***0.9621***	***0.8784***
		**	no	no	no	no
At First Difference		d(LNPSI)	d(LNRGDP)	d(LNGE)	d(LNFER)	d(LNCPI)
With Const.	t-Statistic	-8.2121	-7.7542	-5.5252	-5.3842	-5.0744
	Prob.	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0001***
		***	***	***	***	***
With Const.& Trend	t-Statistic	-8.1170	-6.4932	-5.6545	-5.4052	-5.4334
	Prob.	***0.0000***	***0.0000***	***0.0001***	***0.0003***	***0.0003***
		***	***	***	***	***

Source: Author's calculations performed using E-Views

The unit root tests (Phillips-Perron and Augmented Dickey-Fuller) indicate that all variables—LNPSI, LNRGDP, LNGE, LNFER, and LNCPI—are non-stationary at level but become stationary after first differencing, implying that these variables are integrated of order one (I(1)). For instance, the PP test for LNPSI at the first difference yields a t-statistic of -10.3159 with a p-value of 0.0000, confirming stationarity. Similar patterns are observed for the other variables across both tests. These results suggest that while the variables exhibit stochastic trends in levels, they revert to stationarity in their first differences, making them suitable for cointegration analysis. This justifies the use of the ARDL model, which can handle variables integrated of different orders (I(0) and I(1)) and allows for the analysis of both short-term dynamics and long-term relationships. The ARDL bounds testing approach is particularly suitable here, as the model does not require variables to be integrated of the same order, making it an

appropriate method for investigating the long-run interactions among these economic variables.

VAR Lag Order Selection Criteria

Table 5 presents the VAR Lag Order Selection Criteria, showing different lag lengths and their corresponding criteria for model selection: LogL (log-likelihood), LR (Likelihood Ratio), FPE (Final Prediction Error), AIC (Akaike Information Criterion), SC (Schwarz Criterion), and HQ (Hannan-Quinn Criterion).

Table 5

VAR Lag Order Selection Criteria Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	108.4746	NA	6.92e-09	-4.598870	-4.398129	-4.524036
1	377.3011	465.9661*	1.37e-13*	-15.43561*	-14.23116*	-14.98660*
2	398.3328	31.78124	1.71e-13	-15.25924	-13.05109	-14.43606
3	420.6392	28.75035	2.15e-13	-15.13952	-11.92767	-13.94217
4	434.4061	14.68475	4.46e-13	-14.64027	-10.42473	-13.06876

Source: Author's calculations performed using E-Views

The model with lag 1 is selected based on all criteria, as it minimizes the AIC (-15.44), SC (-14.23), and HQ (-14.99), and also has the smallest FPE (1.37e-13). The Likelihood Ratio (LR) test confirms that lag 1 is statistically significant compared to the others, with a high value of 465.97, further justifying the choice. This indicates that a one-period lag provides the best fit for explaining the dynamic interactions among the variables in the system. Choosing the optimal lag length is critical in VAR models, as too few lags can lead to omitted variable bias, while too many lags may introduce overfitting. The selection criteria suggest that past values of economic variables from one period have a strong influence on current outcomes.

ARDL Long Run Form and Bounds Test

Within the ARDL framework, the co-integrating equation outlines the long-term relationship among the variables being studied. This equation is established when co-integration is detected, signifying that the variables share a common stochastic trend (Poudel, 2023). The hypotheses for the co-integration test are as follows: H0,

stating that there is no co-integrating equation, and H1, asserting the existence of a co-integrating equation. To further investigate these long-term relationships, the ARDL Long Run Form and Bounds Test are performed in Table 6.

Table 6

ARDL Long Run Form and Bounds Test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
		Asymptotic: n=1000		
F-statistic	4.045270	10%	2.2	3.09
k	4	5%	2.56	3.49
		Actual Sample Size 48	Finite Sample: n=50	
		10%	2.372	3.32
		5%	2.823	3.872
			Finite Sample: n=45	
		10%	2.402	3.345
		5%	2.85	3.905

Source: Author's calculations performed using E-Views

The F-Bounds test is used to examine the existence of a long-run relationship between private sector investment (LNPSI) and its independent variables (LNRGDP, LNGE, LNFER, LNCPI). The null hypothesis states that there is no levels relationship among these variables.

The calculated F-statistic is 4.045, which is higher than the critical bounds at the 5% significance level for both the I(0) and I(1) bounds (2.56 and 3.49, respectively). This suggests that there is a cointegrating relationship among the variables, rejecting the null hypothesis of no long-run relationship. The inclusion of 48 observations ensures a robust sample size, which strengthens the reliability of this result.

Economically, this means that the independent variables like Real GDP, government expenditure, foreign exchange rates, and inflation are indeed interrelated with private sector investment in the long run, reflecting how macroeconomic policies and external conditions affect investment decisions in Nepal.

Table 7

Long run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP	1.461743	0.571151	2.559293	0.0142
LNGE	0.124230	0.203520	0.610407	0.5449
LNFER	0.401373	0.211547	1.897325	0.0647
LNCPI	-1.036291	0.539426	-1.921100	0.0615
C	-6.376546	2.929863	-2.176398	0.0352

Source: Author's calculations performed using E-Views

The long-run coefficients of the ARDL model reveal important insights into the determinants of private sector investment (LNPSI). The positive and statistically significant coefficient for real GDP (LNRGDP) suggests that economic growth is a key driver of private sector investment, with a 1% increase in GDP leading to a 1.46% rise in investment, underscoring the pro-growth nature of the relationship. In contrast, government expenditure (LNGE) is found to be insignificant, indicating that public spending does not substantially influence private investment in the long run. The foreign exchange rate (LNFER) has a marginally significant positive effect, implying that exchange rate stability modestly supports investment, possibly through its impact on export competitiveness. Inflation, represented by the consumer price index (LNCPI), exhibits a negative and nearly significant coefficient, indicating that higher inflation tends to discourage private investment by raising uncertainty and costs. The negative and significant constant term suggests underlying structural barriers that may inherently suppress investment, independent of the macroeconomic variables considered.

Short run Coefficients

The short-run coefficients from the ECM (Error Correction Model) regression provide insights into how deviations from the long-run equilibrium are corrected in the short term and the immediate impact of changes in explanatory variables on the dependent variable.

Table 8

Short run Coefficients

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.591453	0.113487	-5.211631	0.0000
R-squared	0.357708	Mean dependent var		0.013054
Adjusted R-squared	0.357708	S.D. dependent var		0.113665
S.E. of regression	0.091095	Akaike info criterion		-1.933222
Sum squared resid	0.390017	Schwarz criterion		-1.894238
Log likelihood	47.39732	Hannan-Quinn criter.		-1.918490
Durbin-Watson stat	1.964233			

Source: Author's calculations performed using E-Views

The short-run coefficients in the ARDL model are captured by the error correction term (CointEq(-1)), which is negative (-0.5915) and highly significant (p = 0.0000). This indicates a strong adjustment mechanism, with approximately 59.15% of the deviation from the long-run equilibrium being corrected each period. The R-squared value of 0.3577 shows that around 35.77% of the variation in private sector investment is explained by the model in the short run. The model's Durbin-Watson statistic of 1.964 suggests no significant autocorrelation in the residuals. Overall, the short-run dynamics reveal a stable adjustment process towards long-run equilibrium.

Granger Causality Test

In the ARDL framework, the Granger Causality Test is a common method used to assess causal relationships among the model's variables. A significant result from this test suggests that historical values of the proposed predictor variable provide useful information for forecasting the dependent variable (Poudel et al., 2023).

Table 9

Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
LNRGDP does not Granger Cause LNPSI	48	14.7040	0.0004
LNPSI does not Granger Cause LNRGDP		3.44844	0.0699
LNGE does not Granger Cause LNPSI	48	12.0751	0.0011
LNPSI does not Granger Cause LNGE		0.07782	0.7816
LNFER does not Granger Cause LNPSI	48	13.0014	0.0008
LNPSI does not Granger Cause LNFER		2.05234	0.1589
LNCPI does not Granger Cause LNPSI	48	13.2063	0.0007
LNPSI does not Granger Cause LNCPI		0.89957	0.3480
LNGE does not Granger Cause LNRGDP	48	15.3832	0.0003
LNRGDP does not Granger Cause LNGE		0.82963	0.3672
LNFER does not Granger Cause LNRGDP	48	0.39018	0.5354
LNRGDP does not Granger Cause LNFER		0.32713	0.5702
LNCPI does not Granger Cause LNRGDP	48	16.9568	0.0002
LNRGDP does not Granger Cause LNCPI		0.90424	0.3467
LNFER does not Granger Cause LNGE	48	0.65007	0.4243
LNGE does not Granger Cause LNFER		1.04551	0.3120
LNCPI does not Granger Cause LNGE	48	1.70589	0.1982
LNGE does not Granger Cause LNCPI		2.28133	0.1379
LNCPI does not Granger Cause LNFER	48	1.52616	0.2231
LNFER does not Granger Cause LNCPI		1.61642	0.2101

Source: Author's calculations performed using E-Views

The Granger causality results reveal the dynamic interactions between private sector investment (LNPSI) and key macroeconomic variables. Real GDP (LNRGDP) strongly Granger-causes LNPSI ($p = 0.0004$), indicating that economic growth is a significant predictor of private sector investment. However, the reverse is not as

strong (p = 0.0699), suggesting that while GDP drives investment, investment does not necessarily predict GDP growth in the short run.

Government expenditure (LNGE) also Granger-causes LNPSI (p = 0.0011), implying that fiscal policies significantly influence private investment. However, LNPSI does not Granger-cause LNGE (p = 0.7816), meaning that changes in private sector investment do not seem to drive government spending.

Similarly, the foreign exchange rate (LNFER) and inflation (LNCPI) Granger-cause LNPSI with significant p-values (0.0008 and 0.0007, respectively), indicating that currency stability and inflation strongly affect investment decisions. However, LNPSI does not Granger-cause either of these variables, suggesting a unidirectional influence where macroeconomic factors affect investment more than investment affects those factors. These results highlight that in Nepal's economic context, macroeconomic policies play a critical role in shaping private investment, but investment's role in influencing macroeconomic variables is limited.

Table 10

Wald Test

Test Statistic	**Value**	**df**	**Probability**
F-statistic	5.203631	(4, 42)	0.0017
Chi-square	20.81453	4	0.0003
Null Hypothesis: C(2)=C(3) =C(4) = C(5)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(2)=LNRGDP		0.864552	0.366585
C(3)= LNGE		0.073476	0.119208
C(4)= LNFER		0.237393	0.121397
C(5)= LNCPI		-0.612918	0.315752

Source: Author's calculations performed using E-Views

The Wald test evaluates the joint significance of the coefficients for the independent variables in the ARDL model. The test results reject this null hypothesis, as both the F-statistic (5.2036, p = 0.0017) and Chi-square (20.8145, p = 0.0003) are highly significant. This indicates that, collectively, the independent variables have a statistically significant impact on private sector investment. The normalized restrictions

show that while some coefficients like LNRGDP (C(2) = 0.8646) and LNFER (C(4) = 0.2374) are positive, LNCPI (C(5) = -0.6129) has a negative impact, suggesting mixed effects of inflation on investment. Overall, the Wald test confirms the relevance of these macroeconomic variables in influencing private sector investment.

Diagnostics and Stability Tests

Diagnostics and stability tests are essential for validating model assumptions, detecting issues, assessing parameter stability, ensuring robustness, improving model specification, and avoiding invalid inferences. They are integral to credible and accurate econometric analysis, ensuring that findings and recommendations are based on sound and reliable models.

Table 11

Diagnostics and Stability Tests

Diagnostics	Statistics	p-value
Normality(J-B)	0.334368	0.846044
Serial Correlation $\chi^2(1)$	0.000160	0.9899
B-P-G Test(Scaled explained SS)	5.929304	0.3132
Ramsey RESET(F_{STAT})	0.271982	0.6048
CUSUM Test	Stable	
CUSUM of Square Test	Stable	

Source: Author's calculations performed using E-Views

Table 11 presents the results of diagnostic and stability tests for the ARDL model, confirming the model's robustness. The Jarque-Bera (J-B) normality test yields a high p-value (0.8460), indicating that the residuals are normally distributed, a critical assumption for reliable hypothesis testing (see Figure 3). The serial correlation test (χ^2 = 0.000160, p = 0.9899) reveals no autocorrelation in the residuals, ensuring that the model captures the full dynamics of the data (see Table 12).

The Breusch-Pagan-Godfrey (B-P-G) test for heteroscedasticity also shows an insignificant result (p = 0.3132), suggesting homoscedasticity, meaning that the variance of the errors is constant over time (see Table 13). The Ramsey RESET test (p = 0.6048) indicates no model specification errors, confirming the model's functional form is correctly specified (see Table 14).

Finally, the CUSUM and CUSUM of Squares tests show stability, implying that the model's coefficients remain consistent over time (see Figure 4 & 5).. These diagnostics confirm that the ARDL model is well-specified, stable, and reliable for analyzing the long-run and short-run relationships between private sector investment and its determinants.

Discussion

The findings from the research on government expenditure and private sector investment in Nepal exhibit both similarities and differences when compared to past studies. The current research emphasizes that government expenditure in Nepal, particularly in infrastructure, tends to have a positive effect on private sector investment, aligning with Keynesian economic theory, which suggests that increased government spending stimulates economic activity (Kunwar, 2019). This complements the findings of Mallick (2016), who observed a similar crowding-in effect in India, where infrastructure spending boosts private investment. However, the current study also highlights that non-infrastructure government spending may not always support private sector investment, mirroring Carvelli's (2023) observation in OECD countries, where excessive non-productive government expenditure can crowd out private investment.

The study's identification of inflation as a negative factor impacting private investment is consistent with Poudel et al. (2024), who found that inflationary pressures in Nepal create uncertainty, thereby discouraging private sector investment. This finding contrasts with Nguyen (2023), who noted that in some developed economies, inflation did not significantly deter private sector activities, likely due to better economic stabilization mechanisms.

Additionally, the research confirms the role of foreign exchange rate fluctuations as a determinant of private investment, supporting Omitogun's (2018) findings in Nigeria, where currency instability discouraged private sector growth. Similarly, the positive relationship between real GDP and private investment noted in the research is in line with Shrestha (2009), who found that economic growth significantly drives private investment in Nepal, though the reverse relationship—where private investment influences GDP—was found to be less prominent.

The use of the ARDL model in this research to assess long-run and short-run dynamics reflects an established approach in econometric studies, as seen in Nguyen's

(2023) analysis of both developed and developing countries. The research further supports the idea that fiscal policy's impact on private investment varies depending on the nature of expenditure and the country's level of development, underscoring the nuanced role of government intervention across different economic contexts.

Conclusion

This study reveals that real GDP is a significant driver of private sector investment in Nepal, reflecting the critical role of economic growth in promoting private sector activities. Government expenditure and foreign exchange rates show a limited or marginal influence, while inflation negatively impacts investment, suggesting that macroeconomic stability is crucial for fostering private sector growth. The ARDL model confirms a long-run relationship between private sector investment and its determinants, with strong adjustment mechanisms evident in the short run. The findings indicate that policy efforts should prioritize economic growth and macroeconomic stability to stimulate private investment. The insignificant role of government expenditure suggests a need for more targeted fiscal policies that directly support private sector development. Furthermore, managing inflation and stabilizing exchange rates are essential to create a conducive environment for investment. These insights can guide policymakers in designing effective strategies for private sector expansion.

This study contributes to the literature by applying the ARDL model to assess the long-term and short-term impacts of key macroeconomic variables on private sector investment in Nepal. Unlike previous studies, it incorporates an in-depth analysis of inflation and exchange rate dynamics, providing a comprehensive understanding of their effects on investment. The use of recent time-series data from 1974/75 to 2022/23 enhances the relevance of the results in the current economic context. Future studies may be conducted to analyze the impact of government expenditure in the different sectors like education, health, infrastructure, etc. aiming to dive deeper and identifying the relationship of government expenditure with private sector investment in different sectors and sub-sectors which can help devise fiscal policy accordingly based on the results.

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Appendix-1

Fiscal Year	Gross Fixed Capital Formation (% of GDP)	Government Expenditure (ten million)	Real GDP	NCPI	FER
1974/75	10.37	151.37	341.64	4.17	10.50
1975/76	10.41	191.33	350.62	4.14	12.13
1976/77	10.94	233.04	349.46	4.26	12.45
1977/78	11.05	267.49	358.00	4.73	12.27
1978/79	9.57	302.05	366.18	4.89	11.90
1979/80	9.49	347.07	361.33	5.37	11.90
1980/81	9.07	409.23	395.55	6.09	11.90
1981/82	9.61	536.13	415.02	6.73	12.90
1982/83	10.77	697.92	417.12	7.68	13.78
1983/84	9.57	743.73	454.73	8.16	15.40
1984/85	12.36	839.48	480.28	8.50	17.83
1985/86	9.91	979.71	502.86	9.84	19.85
1986/87	11.11	1151.32	511.01	11.15	21.59
1987/88	10.31	1410.50	546.66	12.35	22.11
1988/89	9.51	1800.50	575.00	13.38	25.53
1989/90	8.74	1966.93	600.70	14.68	28.54
1990/91	11.71	2354.98	639.30	16.12	31.85
1991/92	12.67	2641.82	668.51	19.51	42.59
1992/93	14.88	3089.77	689.45	21.24	45.49
1993/94	14.38	3359.74	742.67	23.14	49.01
1994/95	15.19	3906.00	762.35	24.92	49.70
1995/96	15.45	4654.24	804.76	26.94	54.96
1996/97	14.76	5072.37	845.77	29.12	56.75
1997/98	14.23	5611.83	872.92	31.55	61.66
1998/99	12.10	5957.90	912.03	35.14	67.63
1999/00	12.36	6627.25	966.78	36.33	68.74
2000/01	15.10	7983.51	1012.95	37.21	73.48
2001/02	15.77	8007.22	1014.58	38.29	76.53
2002/03	16.93	8400.61	1052.82	40.11	77.49
2003/04	17.55	8944.26	1099.26	41.70	73.49
2004/05	17.02	10256.04	1134.81	43.59	71.76
2005/06	18.04	11088.92	1177.13	47.06	72.03
2006/07	17.68	13360.46	1209.51	49.84	70.20

Fiscal Year	Gross Fixed Capital Formation (% of GDP)	Government Expenditure (ten million)	Real GDP	NCPI	FER
2007/08	17.83	16134.99	1279.60	53.18	64.72
2008/09	16.87	21966.19	1329.57	59.87	76.58
2009/10	17.71	22710.73	1386.18	65.60	74.24
2010/11	15.28	25749.54	1436.10	71.87	72.07
2011/12	16.04	29485.07	1507.17	77.85	80.72
2012/13	18.41	30205.39	1553.50	85.51	87.66
2013/14	18.58	42825.11	1642.71	93.27	97.95
2014/15	22.11	49454.85	1700.41	100.00	99.19
2015/16	18.05	72736.45	1700.45	109.94	106.05
2016/17	18.06	96763.32	1846.51	114.83	105.91
2017/18	22.50	95798.01	1982.65	119.60	104.07
2018/19	25.50	97323.36	2109.26	125.14	112.58
2019/20	22.80	107505.34	2058.15	132.84	116.01
2020/21	21.70	117052.98	2150.50	137.62	117.57
2021/22	21.10	122613.15	2263.60	146.32	120.54
2022/23	19.40	120724.24	2312.40	157.64	130.45

Appendix-2

Fiscal Year	LNPSI	LNGE	LNRGDP	LNCPI	LNFER
1974/75	2.34	5.02	5.83	1.43	2.35
1975/76	2.34	5.25	5.86	1.42	2.50
1976/77	2.39	5.45	5.86	1.45	2.52
1977/78	2.40	5.59	5.88	1.55	2.51
1978/79	2.26	5.71	5.90	1.59	2.48
1979/80	2.25	5.85	5.89	1.68	2.48
1980/81	2.20	6.01	5.98	1.81	2.48
1981/82	2.26	6.28	6.03	1.91	2.56
1982/83	2.38	6.55	6.03	2.04	2.62
1983/84	2.26	6.61	6.12	2.10	2.73
1984/85	2.51	6.73	6.17	2.14	2.88
1985/86	2.29	6.89	6.22	2.29	2.99
1986/87	2.41	7.05	6.24	2.41	3.07
1987/88	2.33	7.25	6.30	2.51	3.10
1988/89	2.25	7.50	6.35	2.59	3.24

Fiscal Year	LNPSI	LNGE	LNRGDP	LNCPI	LNFER
1989/90	2.17	7.58	6.40	2.69	3.35
1990/91	2.46	7.76	6.46	2.78	3.46
1991/92	2.54	7.88	6.51	2.97	3.75
1992/93	2.70	8.04	6.54	3.06	3.82
1993/94	2.67	8.12	6.61	3.14	3.89
1994/95	2.72	8.27	6.64	3.22	3.91
1995/96	2.74	8.45	6.69	3.29	4.01
1996/97	2.69	8.53	6.74	3.37	4.04
1997/98	2.66	8.63	6.77	3.45	4.12
1998/99	2.49	8.69	6.82	3.56	4.21
1999/00	2.51	8.80	6.87	3.59	4.23
2000/01	2.71	8.99	6.92	3.62	4.30
2001/02	2.76	8.99	6.92	3.65	4.34
2002/03	2.83	9.04	6.96	3.69	4.35
2003/04	2.87	9.10	7.00	3.73	4.30
2004/05	2.83	9.24	7.03	3.77	4.27
2005/06	2.89	9.31	7.07	3.85	4.28
2006/07	2.87	9.50	7.10	3.91	4.25
2007/08	2.88	9.69	7.15	3.97	4.17
2008/09	2.83	10.00	7.19	4.09	4.34
2009/10	2.87	10.03	7.23	4.18	4.31
2010/11	2.73	10.16	7.27	4.27	4.28
2011/12	2.78	10.29	7.32	4.35	4.39
2012/13	2.91	10.32	7.35	4.45	4.47
2013/14	2.92	10.66	7.40	4.54	4.58
2014/15	3.10	10.81	7.44	4.61	4.60
2015/16	2.89	11.19	7.44	4.70	4.66
2016/17	2.89	11.48	7.52	4.74	4.66
2017/18	3.11	11.47	7.59	4.78	4.65
2018/19	3.24	11.49	7.65	4.83	4.72
2019/20	3.13	11.59	7.63	4.89	4.75
2020/21	3.08	11.67	7.67	4.92	4.77
2021/22	3.05	11.72	7.72	4.99	4.79
2022/23	2.97	11.70	7.75	5.06	4.87

Annexes

Figure 3

Normality Test Result

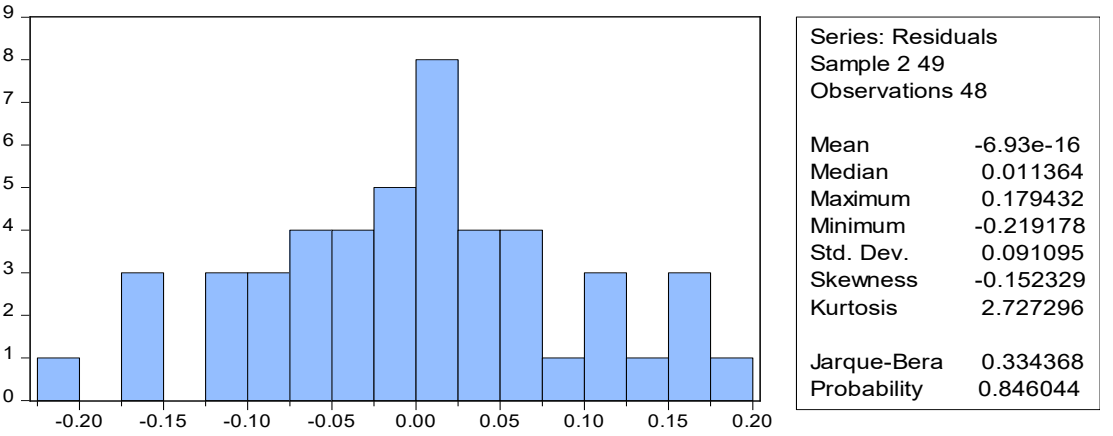


Table 12

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.000137	Prob. F(1,41)	0.9907
Obs*R-squared	0.000160	Prob. Chi-Square(1)	0.9899

Table 13

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.929741	Prob. F(5,42)	0.1096
Obs*R-squared	8.967076	Prob. Chi-Square(5)	0.1104
Scaled explained SS	5.929304	Prob. Chi-Square(5)	0.3132

Table 14

Ramsey RESET Test

Specification: LNPSI LNPSI(-1) LNRGDP LNGE LNFER LNCPI C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.521519	41	0.6048
F-statistic	0.271982	(1, 41)	0.6048

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.002570	1	0.002570
Restricted SSR	0.390017	42	0.009286
Unrestricted SSR	0.387447	41	0.009450

Figure 4

CUCUM Test

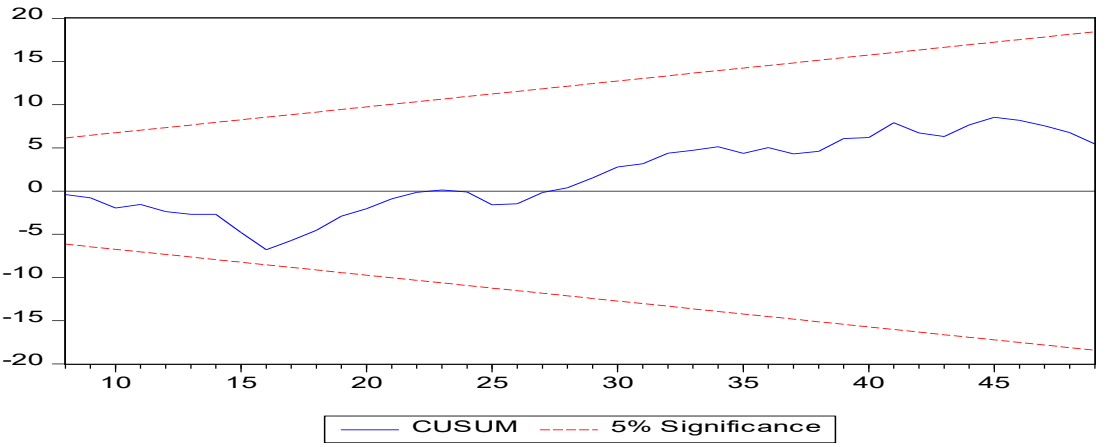
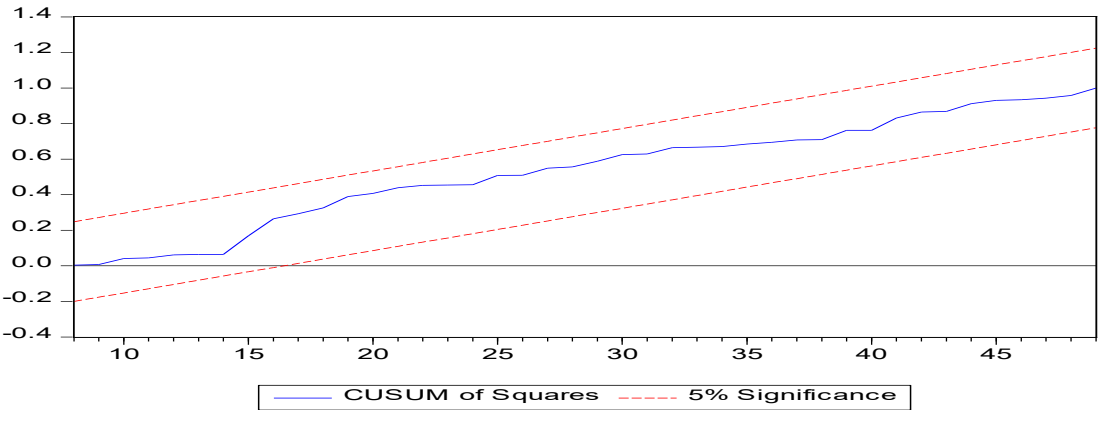


Figure 5

CUCUM of Square Test



Original Research Article

Impact of Climate Change on Livestock-Centric Rural Development: Adaptive Strategies for Sustainable Agriculture

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Abstract

This study investigates the impacts of climate change on livestock-centric rural development in Gaindakot Municipality, Nepal. Livestock farming is the primary livelihood for most households, with 61% maintaining 20-40 animals and 25% owning large-scale operations with over 60 livestock. However, small landholdings (1-5 Kattha) present challenges to economic stability, underlining the need for support to improve productivity. Climate change has significantly impacted livestock health, with 42.9% of households reporting moderate effects and 35.7% experiencing severe impacts, leading to declines in livestock productivity. The study highlights the adoption of water conservation methods, such as drip irrigation, and climate-resilient practices, including drought-resistant fodder and resilient livestock breeds. However, barriers to the broader adoption of these practices, such as a lack of awareness and limited access to resources, were noted. The study also emphasizes stronger policy support and further interventions to promote sustainable agricultural practices. These findings underscore the importance of adapting to climate change through improved livestock management, resource conservation, and enhanced policy frameworks to safeguard rural livelihoods and food security.

Keywords: *Climate change, Livestock farming, Rural Development, Food Security, Sustainable agriculture*

Introduction

Rural development is a transformative process aimed at enhancing all aspects of rural social life. It involves building infrastructure, commercializing agriculture, effectively using and mobilizing resources, ensuring food security, creating new

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opportunities, fostering inclusive social growth within rural communities, and advancing the modernization of society as a whole (Acharya,2008). Rural development aims to improve the economic and social conditions of the rural poor, particularly benefiting small-scale farmers, tenants, and the landless. This strategy must address three key issues: First, the transition from low-yield agriculture to more profitable sectors has been slow, largely due to the limited expansion of the modern sector in developing countries. Second, poverty levels remain high in rural areas and may worsen with rapid population growth and restricted resources, technology, and institutional support. Third, rural areas have valuable resources, including labor, land, and some capital, which, if mobilized effectively, could reduce poverty and enhance quality of life. To achieve this, it is essential to optimize current resources, build infrastructure, adopt new production technologies, and establish new institutions. Together, these efforts can support sustainable development and drive progress in rural communities (World Bank 2024)

Climate represents the long-term average of temperature, humidity, and rainfall patterns across a region or globally, observed over seasons, years, or even decades. Unlike weather, which can shift within hours, climate evolves over extended periods. Climate change specifically refers to substantial shifts in these average conditions, such as warming, increased rainfall, or drought, that develop over multiple decades or more. This extended trend distinguishes climate change from natural fluctuations in daily weather (World Bank, 2024). Climate change can be described as enduring changes in temperature and weather patterns that can naturally result from factors like solar variations or significant volcanic eruptions. However, since the 1800s, human activities—primarily the burning of fossil fuels such as coal, oil, and gas have become the main contributors to climate change. This fuel combustion releases greenhouse gases that envelop the Earth, trapping the sun's warmth and driving up global temperatures (UN, 2023). Climate change leads to long-term shifts in temperature and weather patterns. These variations can happen naturally, influenced by factors like solar activity or major volcanic eruptions. Essentially, climate change represents substantial changes in average weather over decades. Today, it stands as a critical issue for both developed and developing nations, including Nepal (Shreshta, 2023). Emissions of methane, a potent GHG from natural ecosystems are rapidly rising, due to increases in temperature and rainfall. Antarctic sea temperatures have been at record highs in 2024, even as sea ice is at an all-time low, reducing the reflectance of solar radiation (ADB, 2024).

Climate change's impact on agriculture has directly affected both the economy and the lives of people, especially in rural communities. (Chaudhary, Maharjan, & Pallapu, 2020). Human activities, primarily through greenhouse gas emissions, have undoubtedly driven global warming, with global surface temperatures rising to 1.1°C above the 1850–1900 levels by 2011–2020. From 2010 to 2019, greenhouse gas emissions continued to grow, reflecting unequal contributions over time due to unsustainable energy use, land use changes, and consumption and production patterns across and within countries, regions, and even individuals. Human-driven climate change is now impacting weather and climate extremes globally, resulting in widespread negative effects on food and water security, human health, economies, and society, as well as causing extensive losses to ecosystems and communities. Particularly affected are vulnerable populations who have historically contributed the least to climate change, bearing the most disproportionate impact (UN, 2023). Livestock production accounts for around 40% of the global agricultural GDP. It supplies 33% of the world's protein and contributes 17% of the total calories consumed globally (Cheng McCarl & Fei, 2022). The effects of climate change are evidently affecting people's livelihoods across the globe. As a result, building human capacity to adapt to these changes has become a pressing necessity (Khatri, & Pasa, 2023). The interplay between ongoing climate change and the rising demand for livestock production creates challenges in boosting production while reducing climate impacts and greenhouse gas (GHG) emissions. Tackling these issues requires insight into how climate change affects livestock production, along with the effects of adaptation and mitigation strategies (Cheng McCarl, & Fei, 2022).

Climate change in Nepal affects food and agricultural systems differently across national, regional, and district levels. These impacts can vary, being positive, negative, or neutral depending on geography, so spatial data is essential for designing effective adaptive policies. For Nepal, a developing country, adaptation is more practical than mitigation. However, it is important for Nepal to advocate globally about the costs it incurs, such as increased pesticide use, altered rainfall patterns, natural disasters, and biodiversity loss, all linked to climate change. (Acharya & Bhatta, 2013). Mountain regions are particularly vulnerable to climate change and are expected to experience even greater impacts in the years ahead. Farmers observe that, on average, annual temperatures are increasing, and precipitation patterns are becoming more unpredictable, which adversely affects mountain livelihoods (Adhikari, Prasai,

Lamichhane, Gautam, Sharma & Acharya,2021). The negative impacts of climate change are escalating, affecting all aspects of life and jeopardizing quality of life in both urban and rural areas. The influence of climate change is evident across various parts of daily life, posing a significant threat to the urbanization process. These adverse effects, both direct and indirect, are impacting public health, leading to a rise in mortality rates(WHO,2018) .Climate change triggers a chain of risks, affecting ecosystems, agro-ecosystems, agricultural production, and food chains. These impacts extend to incomes and trade, influencing the economy and society, and ultimately threatening livelihoods, food security, and nutrition (FAO (2015). Rural communities, which often experience the impacts of climate change most directly, serve as crucial early warning indicators for society. These communities deserve support, not only for their intrinsic value and the well-being of their residents but also for their importance to all life on Earth (Christopher , Atkinson and Atkinson 2023). Climate change primarily threatens food and nutrition security. As Nepal's economy grows increasingly fragile, with agriculture as its foundation, the nation faces a high risk of experiencing the severe impacts of climate change (Dhungel, 2024).Climate change has notably impacted the Tarai and Gangetic Plain regions, with over 80% of GRB farmers observing shifts in temperature and precipitation. Floods frequently affect mountain areas, while droughts are common in the Gangetic Plain. Additionally, 74% of farmers reported climate-related crop diseases and pests, and vegetation cover was most affected in mountainous regions (Rai, Zhang, Paudel , Yan & Khanal,2023) .Terai districts have greater exposure due to their extensive agricultural lands, larger populations of livestock and poultry, and increased fishery activities. Districts in Mechi, Madesh, and Bagmati Provinces have higher exposure compared to other regions, whereas all districts in Karnali Province show very low or low exposure (GoN,2021).

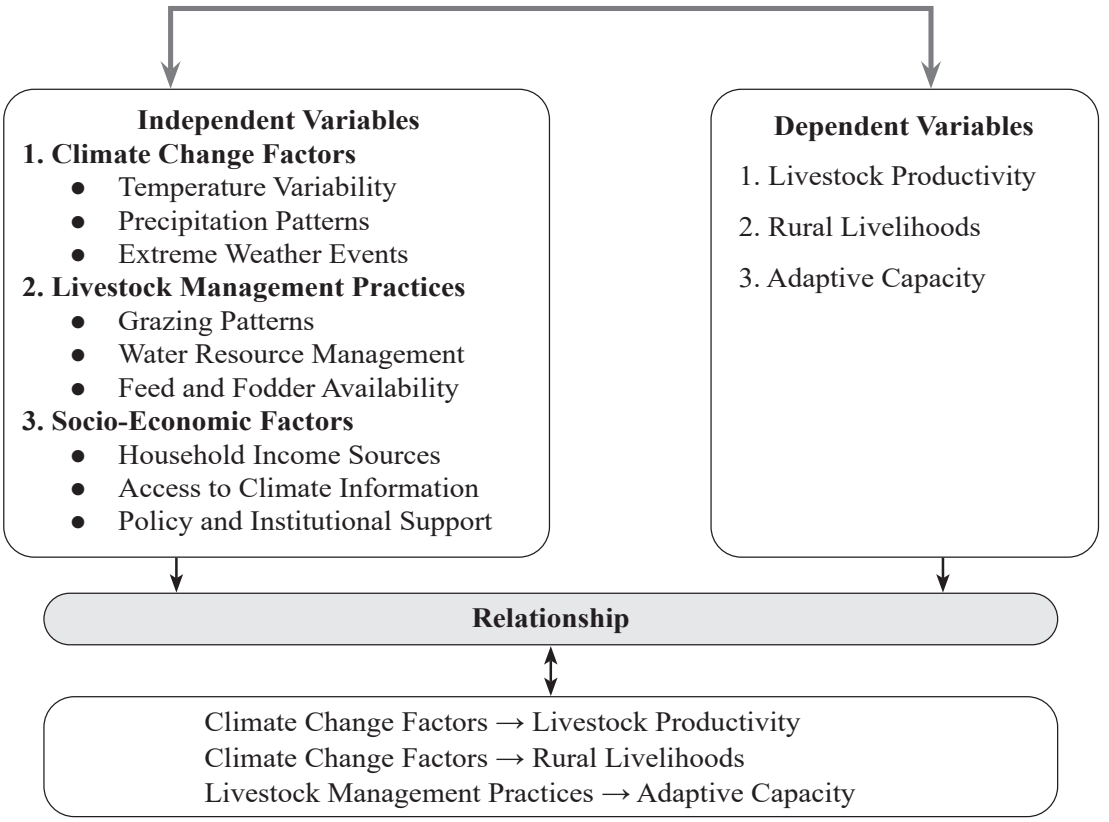
Climate change threatens livestock-centric rural development by disrupting livestock health, reducing productivity, and increasing disease prevalence. Erratic weather patterns and extreme climatic events undermine livelihoods and food security, leaving rural households highly vulnerable. Addressing these challenges is crucial for safeguarding the sustainability of livestock-dependent communities. This research seeks to address the knowledge gap by evaluating the impacts of climate change on livestock and examining the resilience of adaptive strategies. It aims to provide evidence-based recommendations for promoting sustainable agricultural practices, ensuring the long-term viability of livestock-dependent rural communities in the face of climate change.

Objective of the Study

- To assess the impact of climate change on livestock health, productivity, and the livelihoods of rural communities dependent on livestock farming.
- To identify adaptive strategies and best practices currently employed by livestock-centric rural communities to mitigate the adverse effects of climate change.
- To analyse the effectiveness of sustainable agricultural approaches in enhancing resilience among livestock-dependent rural communities, focusing on resource management, technological adoption, and policy support.

Conceptual Framework

The conceptual framework outlines the relationship between climate change and its effects on livestock-centric rural development, with a focus on crafting adaptive approaches for sustainable agriculture. The framework identifies key independent and dependent variables that drive the interaction between climate change and rural livelihoods, particularly those centered on livestock.



This conceptual framework provides a structured approach to understanding how climate change influences livestock-centric rural development. By identifying and analyzing the relationships between independent and dependent variables, the framework aims to guide the development of adaptive strategies that ensure sustainable agriculture in the face of climate change.

Literature Review

The study by Kangalawe and Lyimo (2013) reveals that most households rely on agriculture as their primary livelihood, making them highly vulnerable to climate change impacts on food security and overall well-being. Diversification into non-agricultural activities enhances adaptive capacity, providing crucial support when agriculture is negatively affected. Declining crop productivity is attributed to both climate-related factors, such as late rainfall, increased temperatures, and frequent droughts, and non-climatic issues like land shortages, low soil fertility, and inadequate extension services.

Another study by Koirala & Shrestha (2018) investigates climate change in Mustang's Jomsom and Kagbeni and concludes that it has caused disease outbreaks, increased parasites, reduced forage availability, and pasture degradation, leading to a decline in livestock numbers and income. Consequently, residents are shifting to alternative professions to sustain their livelihoods.

Chaudhary, Maharjan, & Pallapu, (2020). Local governments play a crucial role in addressing climate change impacts through policies, budgets, and social safety nets. Strengthening weather forecasting, advanced research, and awareness-building are essential for protecting vulnerable farmers. An interdisciplinary approach is vital for developing effective solutions to mitigate climate challenges in Nepal.

According to Verma and Sudan (2021), marginal and small farmers are highly vulnerable to climate change due to their reliance on agriculture and limited resources. Adaptation is essential to enhance resilience, secure livelihoods, and sustain agriculture under changing climatic conditions. Climate-smart agriculture emerges as a vital approach to adapt, ensure food and livelihood security, and mitigate greenhouse gas emissions.

In Dey's (2023) findings, climate change has severely impacted Bangladesh's livestock industry through increased disease, heat stress, and reduced productivity due

to higher temperatures and excessive rainfall. Mitigation requires improved livestock management, resilient breeds, and alternative feed. Collaborative efforts among policymakers, institutions, and organizations are essential to promoting climate-smart practices and supporting farmers in adapting to these challenges.

A study by Food and Agriculture Organization of the United Nations (2023) estimates the impacts of climate change on livestock systems, particularly cattle and buffaloes, which are essential for milk and meat production. It projects significant losses due to heat stress, with meat production potentially dropping by up to 22% and milk production by up to 21% by 2085, depending on climate scenarios (RCP 2.6 and RCP 8.5).

According to Singh, Leua, and Nidhishree (2024), climate-induced disasters have a direct impact on farmers' livelihoods since they rely on agriculture and animal husbandry, all of the respondents agreed that a drop in animal-agricultural production weakened the local economy. Because livestock is and will continue to play a significant part in the rural economy, it is critical to find appropriate solutions to mitigate the negative effects of climate change on livestock output.

Imelda and Hidayat (2024) in a study on climate change in Indonesia highlights four key findings. First, most studies focus on crop farming (60%), followed by fisheries (23%) and general agriculture (17%), with Java as the primary geographic focus. Second, Climate Change Adaptation and Mitigation (CCAM) strategies fall into ecological, economic, and social categories, emphasizing a balanced approach to sustainable agriculture. Ecological adaptations include technology adoption, economic strategies involving livelihood diversification, and social measures using indigenous knowledge. Third, socioeconomic factors like gender, education, and resource access influence adaptive capacity. Finally, CCAM strategies may involve short-term trade-offs, such as reduced productivity and high initial investments.

Methodology

Research Design

A mixed-methods research design was used for the study. The quantitative aspect involved surveys and structured data collection to assess the impact of climate change on livestock health, productivity, and rural livelihoods. Measurable indicators such as livestock mortality rates, productivity changes, and income shifts were

analyzed using statistical methods. These data allowed for a numerical evaluation of how climate change affected livestock-dependent communities. In parallel, qualitative methods such as interviews, focus groups, and case studies explored the adaptive strategies employed by rural communities. These methods provided deeper insights into the adoption of water conservation techniques, climate-resilient livestock breeds, and sustainable feeding practices. Additionally, qualitative data helped understand the perception of policy support and the effectiveness of resource management practices and climate-smart agricultural technologies. By combining these approaches, the study not only measured the direct impacts but also uncovered the underlying social, cultural, and policy factors that influenced the effectiveness of adaptive strategies, thus providing a more holistic understanding of climate change adaptation in livestock-centric rural development.

Source of Data

The research utilized both qualitative and quantitative data to gain a comprehensive understanding of the topic. Primary data was collected through surveys, interviews, and field observations, providing firsthand insights. Secondary data was sourced from existing reports, research papers, and official records, allowing for a broader context and supporting the study's analysis.

Sampling Method and Sample Size

Gaindakot Municipality, comprising 18 wards, has been purposively selected as the study area. Among these, five wards (1, 8, 10, 11, and 14) have been identified for detailed analysis. The selection of these specific wards was based on their relevance to the research objectives. Within these selected wards, there are a total of 94 firms. To ensure focused and meaningful data collection, 28 firms were purposively chosen from this pool. This sampling strategy allows for an in-depth examination of the study variables, ensuring that the selected firms provide rich insights aligned with the research's primary objectives. The sample structure is presented in the following table:

Table 1

Sampling Method and Sample Size

Wards	Population					Sample Size					Total sample Size
	Cow Firms	Goat Firms	Pig Firms	Hatchery Firms	Hens Firms	Cow Firms	Goat Firms	Pig Firms	Hatchery Firms	Hens Firms	
1	6	-	-	-	5	1				1	2
8	6	1			2	1	1			1	3
10	52	1			1	6	1			1	8
11	27	1	3		2	5	1	3		1	10
14	3	1		1	9	1	1		1	2	5
Total	94	04	03	01	19	14	04	03	01	06	28

Data analysis

Data analysis for this research was conducted using both quantitative and qualitative methods. The quantitative data, collected through surveys, were analyzed using statistical tools to assess the impact of climate change on livestock health, productivity, and rural livelihoods. Descriptive statistics, such as frequencies and percentages, were used to examine the adoption of adaptive strategies like water conservation techniques and climate-resilient breeds. The qualitative data from interviews and focus groups were analyzed thematically to explore the effectiveness of resource management practices, technological adoption, and policy support for sustainable agriculture. This combined approach provided a comprehensive understanding of climate change impacts and adaptation strategies.

Results and Discussion

Caste Composition of the Respondents

The caste composition of Gaindakot Municipality in Nawalparasi District showcases the rich ethnic and cultural diversity of Nepal. The predominant castes in this area include Brahmin, Chhetri, Magar, Tharu, Dalit, Newar, and Tamang (Municipal Profile,2081).

Table 2

Caste Composition of the Respondents

S.N	Caste	Frequency	Percent
1.	Brahman	17	60
2.	Magar	4	14
3.	Newar	2	7
4.	Tharu	2	7
5.	Gurung	1	4
6.	Chhetri	1	4
7.	Dalit	1	4
	Total Households	28	100

Source: Field survey, 2022

Table 2 shows that the Brahman caste constitutes a significant majority, accounting for 60%. This dominance suggests a strong presence of Brahman culture and practices in the community, potentially influencing local governance, education, and social norms. The next largest group is the Magar caste, making up 14%. Their presence indicates that indigenous cultures are also part of the community's fabric. However, the low representation of other castes, such as Newar (7%), Tharu (7%), Gurung (4%), Chhetri (4%), and Dalit (4%), highlights a disparity in representation. The caste composition of households in Gaindakot Municipality illustrates a significant imbalance, with the Brahman caste overwhelmingly represented. While there is some diversity, the low numbers of other castes indicate potential issues of marginalization. Recognizing these dynamics is crucial for promoting inclusivity and equity in community development efforts.

Food Sufficiency

Food security is present when every person has stable physical and financial access to adequate, safe, and nutritious food that fulfills their dietary requirements and personal choices, supporting an active and healthy lifestyle. (World Bank,2024). Food sufficiency refers to the condition where a population or community has an adequate and stable supply of food to meet its nutritional needs without relying heavily on imports or external assistance. It emphasizes the ability of local agricultural production,

resources, and systems to provide enough food for the people within a specific area. Achieving food sufficiency involves ensuring that food is not only available but also accessible, affordable, and culturally acceptable to the population, thus contributing to overall food security and the well-being of individuals and communities.

Table 3

Food Sufficiency

Food Sufficiency	Frequency	Percent
6-12 month	16	57
Surplus	12	43
Total Households	28	100

Source: Field Survey, 2022

Table 3 indicates that all 28 households surveyed are either able to sustain their food supply for 6-12 months or have a surplus, demonstrating a generally positive state of food security within the community. The majority, 57% (16 households), report having food sufficiency for 6-12 months. This suggests that these households can adequately manage their food resources for a significant duration, reflecting effective agricultural practices, good food storage strategies, or a consistent income that supports food purchasing. A notable 43% (12 households) report having surplus food. This surplus indicates not only food security but also the potential for economic benefits through the sale or sharing of excess food. Households with surplus can contribute to local markets and enhance community resilience by providing food to those who may experience shortages in the future. The combined data suggests a robust community framework for food production and management. The presence of both food-sufficient and surplus households can foster a supportive environment where food security is reinforced through shared resources and community cooperation. The surplus reported can stimulate local economic activities. Households that produce more food than they need may engage in selling their surplus, thus promoting local trade and potentially increasing household incomes. This could contribute to overall economic stability in the area. The data presents a favorable picture of community food security, with over half of the households able to sustain their food needs for 6-12 months and a significant portion reporting surplus production. This situation reflects a resilient

agricultural community that can support itself and contribute to local economic activities. Continued attention to food security practices and the support of vulnerable households will be crucial for maintaining this positive trend.

Livestock Holding of the Respondents

Livestock holding plays a crucial role in the local economy and agricultural practices. The predominant livestock includes cattle, buffaloes, goats, and poultry, which serve various purposes such as providing meat, milk, and eggs, as well as contributing to household income.

Table 4

Livestock size of the Respondents

Livestock	Frequency	Percent
10-20	2	7
20-40	17	61
40-60	2	7
60 and above	7	25
Total	28	100

Source: Field Survey, 2022

Table 4 presents the distribution of livestock sizes among the 28 surveyed households in Gaindakot Municipality, revealing insights into livestock farming practices in the area. The most common category is households with 20-40 livestock, comprising 61% (17 households). This suggests that a majority of the respondents engage in moderate to substantial livestock farming, which may be a significant aspect of their livelihood and economy. Households with 60 or more livestock represent 25% (7 households). This group, while smaller, indicates the presence of larger-scale livestock operations, which can provide more substantial income and food security benefits. These households may have greater resources and better access to markets, impacting their overall economic stability. The categories of 10-20 and 40-60 livestock each account for only 7% (2 households each). This low representation could suggest that few households opt for very small or moderately large livestock holdings, possibly reflecting market dynamics, resource availability, or a preference for larger herds to maximize productivity. The distribution of livestock sizes among respondents in

Gaindakot Municipality illustrates a significant engagement in livestock farming, with a majority of households maintaining moderate herds of 20-40 animals. This suggests that livestock farming is an essential component of their livelihoods. The presence of households with larger herds indicates economic potential, while the low number of households with very small or moderately large holdings could suggest a need for support and resources to enhance livestock productivity and sustainability in the community.

Landholding Size

Land is a key resource in determining people's wealth and social status. Families with larger landholdings are typically considered higher class, while those with smaller holdings are seen as lower class. Additionally, the fertility and irrigation potential of the land influence a family's status, with fertile, irrigated land being more valuable. The size of a household's landholding directly affects its reliance on forest resources: those with more land depend less on forests, whereas households with less land tend to rely more heavily on these resources. The following table presents landholding sizes among respondents in the study area.

Table 5

Landholding Size of the Respondents

Land (In Kattha)	Frequency	Percent
1-5	12	43
6-10	2	7
11-15	11	39
Above 15	3	11
Total	28	100

Source: Field Survey, 2022.

The largest group of respondents, 43% (12 households), falls within the 1-5 kattha range. A close second, 39% (11 households), own land in the 11-15 kattha range. The 6-10 kattha category shows very low representation at 7% (2 households), while 11% (3 households) have landholdings above 15 kattha. The analysis of landholding size reveals a predominance of small landholdings (1-5 kattha), suggesting challenges for many households in achieving sufficient agricultural output and economic stability.

While a significant proportion of households possess moderate landholdings (11-15 kattha), the overall distribution indicates limited opportunities for larger-scale farming. Addressing the needs of small landholders through support services and cooperative initiatives may be crucial in enhancing agricultural productivity and ensuring food security within the community.

Plants, Fodder and Grazing Lands

Access to plants, fodder, and grazing land is crucial for local survival. In developing countries like Nepal, animal husbandry significantly contributes to economic development. In the study area, livestock graze primarily in forests rather than on private or public grazing lands, as there is no dedicated public grazing area. Fodder, essential for livestock, is mostly gathered from community forests and private lands. Although the region has low agricultural yields, it is rich in forest resources, supporting a high density of livestock farming. Locals rely on animal husbandry and vegetable farming for survival, gathering fodder, fuel wood, and leaves year-round. The table below outlines grazing land access and fodder collection patterns.

Table 6

Access of Collect of Plant, Fodder, and Grazing Land

Name of grazing land	Frequency	Percent	Fodder collection in different seasons	Frequency	Percent
Forests	7	25	Summer	7	25
Own land	19	68	Winter	3	11
Public grazing land	2	7	Summer/Winter	18	64
No access to grazing land	0	0			
Total	28	100		28	100

Source: Field Survey, 2022

Table 6 illustrates access to plant collection, fodder, and grazing land among households in the study area. A significant majority, 68% (19 households), access their own land for grazing, while 25% (7 households) utilize forests, indicating a reliance on privately owned resources. Public grazing land is less common, used by only 7% (2 households). Regarding fodder collection, 64% (18 households) gather fodder in both

summer and winter, suggesting adaptability in managing seasonal changes. In contrast, only 25% (7 households) collect fodder solely in summer, and 11% (3 households) do so in winter. This data indicates a strong capacity among households to secure necessary fodder year-round, which is vital for livestock sustainability and overall agricultural productivity. Such access supports livelihoods, enhancing food security in the community.

Impact of Climate Change on Livestock Health

The impact of climate change on livestock health is becoming increasingly evident. Rising temperatures and erratic rainfall patterns contribute to the prevalence of heat stress, which adversely affects livestock productivity and reproductive performance. Additionally, changing climate conditions can exacerbate the spread of diseases and parasites, posing significant risks to animal health. Water scarcity further complicates the situation, limiting access to clean drinking water and quality forage. Farmers face challenges in managing their herds, leading to reduced livestock productivity and increased economic vulnerability.

Table 7

Impact of Climate Change on Livestock Health

Impact Level	Frequency	Percent
Severe Impact	10	35.7
Moderate Impact	12	42.9
Mild Impact	6	21.42
Total	28	100

Source: Field survey, 2022

Table 7 shows that 42.9% (12 households), report a moderate impact, while 35.7% (10 households) experience severe effects on their livestock. Only 21.4% (6 households) indicate a mild impact. This distribution highlights that over three-quarters of the respondents perceive notable challenges due to climate change, which may affect livestock productivity, health, and overall agricultural sustainability. These findings underscore the need for targeted interventions to mitigate climate impacts and enhance livestock management practices in the community.

Impact of Climate Change on Livestock Productivity

Climate change significantly impacts livestock productivity, affecting the livelihoods of local farmers. Altered weather patterns, including increased temperatures and unpredictable rainfall, lead to reduced forage availability and lower nutritional quality, directly influencing livestock growth and milk production. Heat stress in animals decreases reproductive performance and increases mortality rates, further diminishing productivity. Additionally, the rise in livestock diseases due to changing climate conditions poses a threat to herd health, compounding the issue.

Table 8

Impact of Climate Change on Livestock Productivity

Impact Level	Frequency	Percent
Significant Decline	9	32.1
Moderate Decline	11	39.3
Minor Decline	8	28.57
Total	**28**	**100**

Source: Field survey, 2022

Table 8 shows that, 32.1% experienced a significant decline, 39.3% a moderate decline, and 28.57% a minor decline. This indicates that climate change is having a substantial negative impact on livestock productivity in the surveyed area. A substantial portion (32.1%) of respondents experienced a significant decrease in livestock productivity. This suggests that climate change is severely affecting the health, growth, and overall yield of livestock in the region. A considerable number of respondents (39.3%) reported a moderate decline in productivity. This indicates that climate change is negatively impacting livestock, although to a lesser extent than the significant decline group. While a smaller proportion (28.57%) experienced only a minor decline, it still highlights the widespread impact of climate change on livestock productivity. Even a minor decline can have economic and social consequences for farmers and communities reliant on livestock. Climate change is posing a substantial threat to livestock productivity in the surveyed area. This has implications for food security, rural livelihoods, and the overall economy of the region.

Impact of Climate Change on Livelihoods of Rural Communities

Climate change poses significant threats to the livelihoods of rural communities, particularly those dependent on agriculture and livestock. Erratic weather patterns, including increased temperatures and unpredictable rainfall, disrupt farming schedules and reduce crop yields, leading to food insecurity. Livestock health is compromised by heat stress and the spread of diseases, diminishing productivity and income. Additionally, limited access to water resources exacerbates these challenges, making it difficult for farmers to sustain their operations.

Table 9

Impact of Climate Change on Livelihoods of Rural Communities

Impact on Livelihoods	Frequency	Percent
High Impact	13	46.4
Moderate Impact	9	32.1
Low Impact	6	21.42
Total	**28**	**100**

Source: Field survey, 2022

Table 9 shows that, 46.4%, reported a high impact on their livelihoods. This suggests that climate change is a major challenge for these communities, affecting their ability to sustain their livelihoods. Additionally, 32.1% of respondents reported a moderate impact, indicating that climate change is still a significant concern for a substantial portion of the rural population. Only 21.42% of respondents reported a low impact, highlighting the widespread nature of the issue. These findings underscore the urgent need for targeted interventions and policies to help rural communities adapt to the challenges posed by climate change. Such interventions could include climate-smart agriculture practices, improved access to water resources, and social safety nets to protect vulnerable populations.

Adoption of Water Conservation Techniques

The adoption of water conservation techniques is crucial for sustainable agriculture and livestock management. Farmers are increasingly implementing methods such as rainwater harvesting, drip irrigation, and water recycling to optimize water usage amid changing climate conditions. These techniques help improve crop

yields and ensure livestock health by providing a reliable water supply.

Table 10

Adoption of Water Conservation Techniques

Strategy	Frequency	Percent
Drip Irrigation	9	32.14
Improved Irrigation Systems	5	17.85
Water Reuse	3	10.71
No Water Conservation	8	28.57
Constructing Gabion Walls	3	10.71
Total	**28**	**100**

Source: Field survey, 2022

Table 10 summarizes the adoption of water conservation techniques among 28 respondents. Drip irrigation is the most widely adopted technique (32.14%), highlighting its perceived efficiency in minimizing water wastage. Improved irrigation systems follow with 17.85%, showing moderate adoption and suggesting potential barriers like cost or accessibility. Water reuse and constructing gabion walls are both adopted by 10.71% of respondents, indicating limited uptake, possibly due to practical challenges in implementing these methods. A notable 28.57% of respondents do not engage in any water conservation methods, underscoring a gap in resources, awareness, or support. This segment points to an opportunity for interventions to encourage sustainable water practices. Overall, while drip irrigation shows popularity, the presence of respondents with no conservation strategies highlights a need for further outreach and assistance in promoting water-saving techniques.

Use of Climate-Resilient Livestock Breeds

The use of climate-resilient livestock breeds is becoming essential for adapting to the impacts of climate change. Farmers are increasingly selecting breeds that can withstand heat stress, resist diseases, and thrive in variable environmental conditions.

Table 11

Use of Climate-Resilient Livestock Breeds

Strategy	Frequency	Percent
Adapted Livestock Breeds	10	35.7
Mixed Breeding Techniques	7	25.0
Traditional Breeds	6	21.4
No Specific Breeding Strategy	5	17.9
Total	**28**	**100**

Source: Field survey, 2022

Table 11 shows that 35.7%, are utilizing adapted livestock breeds that are more resilient to climate-related challenges such as heat stress, drought, and disease. This suggests a growing awareness of the importance of genetic adaptation in livestock production. Mixed breeding techniques, adopted by 25% of respondents, involve crossbreeding traditional breeds with more resilient ones to improve their overall performance. This approach can enhance the adaptability of livestock to changing climatic conditions. 21.4% of respondents continue to rely solely on traditional breeds, which may be less resilient to climate change. Additionally, 17.9% of respondents have no specific breeding strategy, which could further exacerbate the negative impacts of climate change on livestock. To mitigate these challenges, it is crucial to promote the adoption of climate-resilient livestock breeds and breeding techniques. This can be achieved through education, training, and access to quality breeding stock. By investing in sustainable livestock practices, farmers can enhance their resilience to climate change and ensure long-term food security.

Implementation of Sustainable Feeding Practices

The implementation of sustainable feeding practices is vital for improving livestock health and productivity. Farmers are increasingly adopting techniques such as rotational grazing, utilizing local feed resources, and supplementing diets with nutrient-rich forage. These practices not only enhance animal nutrition but also promote soil health and reduce environmental impact.

Table 12

Implementation of Sustainable Feeding Practices

Practice	Frequency	Percent
Use of Drought-Resistant Fodder	11	39.3
Supplementary Nutritional Feeding	9	32.1
Seasonal Grazing Adjustments	5	17.9
No Sustainable Feeding Practice	3	10.7
Total	**28**	**100**

Source: Field survey, 2022

Table 12 shows that 39.3%, are utilizing drought-resistant fodder, demonstrating a proactive approach to mitigating the impacts of climate change on livestock feed availability. Supplementary nutritional feeding, adopted by 32.1% of respondents, can help maintain livestock health and productivity, especially during periods of feed scarcity. Seasonal grazing adjustments, practiced by 17.9% of respondents, can help optimize livestock grazing and reduce pressure on pasturelands. However, a concerning 10.7% of respondents have not implemented any sustainable feeding practices, which could compromise the health and productivity of their livestock. To enhance the resilience of livestock systems, it is essential to promote the adoption of sustainable feeding practices. This can be achieved through education, training, and access to quality fodder and feed supplements. By adopting these practices, farmers can ensure the well-being of their livestock and contribute to sustainable agriculture.

Effectiveness of Resource Management Practices

Effective resource management practices are crucial for enhancing agricultural sustainability. Farmers are implementing techniques like water conservation, soil management, and crop rotation. These practices improve productivity, mitigate climate impacts, and promote efficient use of local resources, ultimately contributing to the resilience and livelihoods of the rural community.

Table 13

Effectiveness of Resource Management Practices

Practice	Frequency	Percent
Efficient Water Use	10	35.7
Soil Conservation Techniques	8	28.6
Crop-Livestock Integration	6	21.4
No Resource Management	4	14.3
Total	**28**	**100**

Source: Field survey, 2022

Table13 shows that 35.7%, are implementing efficient water use techniques, demonstrating a growing awareness of the importance of water conservation in agriculture. Soil conservation techniques, adopted by 28.6% of respondents, can help protect soil quality and prevent erosion, which is crucial for long-term agricultural productivity. Crop-livestock integration, practiced by 21.4% of respondents, can enhance nutrient cycling, improve soil fertility, and reduce reliance on external inputs. However, a concerning 14.3% of respondents have not adopted any resource management practices, which could lead to resource degradation and reduced agricultural yields. To promote sustainable agriculture, it is essential to encourage the adoption of effective resource management practices. This can be achieved through education, training, and access to appropriate technologies. By implementing these practices, farmers can improve their livelihoods, protect the environment, and ensure food security for future generations.

Adoption of Climate-Smart Agricultural Technology

The adoption of climate-smart agricultural technology is gaining momentum among local farmers. Techniques such as improved irrigation systems, precision farming, and resilient crop varieties enhance productivity while reducing environmental impact.

Table 14

Adoption of Climate-Smart Agricultural Technology

Technology Type	Frequency	Percent
Digital platforms	4	14.29
Renewable energy use	3	10.71
No technological adoption	6	21.43
Agroforestry	4	14.29
Integrated pest management (IPM)	3	10.71
Crop diversification	4	14.29
Soil testing and fertility management	2	7.14
Improved storage facilities	1	3.57
Crop insurance	1	3.57
Total	**28**	**100**

Source: Field survey, 2022

Table14 illustrates the adoption rates of various climate-smart agricultural technologies among respondents, providing insight into sustainable farming practices in the study area. Digital platforms, agroforestry, and crop diversification each account for 14.29% of the adoption, indicating a balanced interest in tools that enhance resource efficiency and ecosystem resilience. However, the notable rate of "no technological adoption" (21.43%) highlights a significant barrier to broader adoption of climate-smart practices, suggesting potential issues such as lack of awareness, access, or affordability. Lower adoption rates are evident in soil testing (7.14%), improved storage (3.57%), and crop insurance (3.57%), which are vital for long-term agricultural sustainability but appear underutilized. Renewable energy and integrated pest management (10.71% each) show moderate adoption, reflecting an emerging interest in eco-friendly practices. The data indicate a gradual shift towards climate resilience, with some technologies more widely accepted than others, yet with area for improvement in comprehensive adoption.

Perception of Policy Support for Sustainable Agriculture

Perceptions of policy support for sustainable agriculture vary among farmers. Many appreciate government initiatives aimed at promoting sustainable practices, while others express concerns about inadequate resources and implementation.

Table 15

Perception of Policy Support for Sustainable Agriculture

Level of Policy Support	Frequency	Percent
Highly Supportive	4	14.28
Moderately Supportive	10	35.7
Minimally Supportive	8	28.6
No Policy Support	6	21.42
Total	**28**	**100**

Source: Field survey, 2022

Table15 shows that 35.7%, perceive moderate levels of support, suggesting that some policies are in place to promote sustainable practices. However, 28.6% perceive minimal support, indicating a need for more targeted and effective policies. A concerning 21.42% of farmers feel there is no policy support for sustainable agriculture, highlighting a gap in policy implementation and outreach. While 14.28% perceive high levels of support, further investigation is needed to identify the specific policies contributing to this perception. To enhance the adoption of sustainable agriculture, it is crucial to strengthen policy support. This includes developing clear and coherent policies, providing adequate financial incentives, and ensuring effective implementation and monitoring. By addressing the perceived gaps in policy support, governments can empower farmers to transition to more sustainable practices and contribute to environmental conservation and food security.

Effects of Climate Change on Livestock-Centric Rural Development

Climate change adversely affects livestock-centric rural development through declining animal health, reduced productivity, and increased vulnerability to diseases. Erratic weather patterns disrupt grazing and feed availability, threatening food security and livelihoods.

Table 16

Effects of Climate Change on Livestock-Centric Rural Development

Effect of Climate Change	Frequency	Percent
Decreased Livestock Health	12	42.9
Reduced Productivity	10	35.7
Increased Livelihood Challenges	9	32.1
Altered Feeding Practices	8	28.6
Increased Livestock Diseases	11	39.3
Economic Instability	7	25.0
Changes in Resource Availability	10	35.7
Total	28	100

Source: Field survey, 2022

Table 16 highlights the significant negative impacts of climate change on livestock-centric rural development. A substantial proportion of respondents, 42.9%, reported decreased livestock health due to factors such as heat stress and disease outbreaks exacerbated by changing climatic conditions. Reduced productivity, affecting 35.7% of respondents, is another major consequence, as climate change can lead to lower milk yields, reduced weight gain, and decreased fertility in livestock. This, in turn, impacts the livelihoods of rural communities heavily reliant on livestock. Increased livelihood challenges, reported by 32.1% of respondents, are a direct result of these factors. Altered feeding practices, increased livestock diseases, economic instability, and changes in resource availability further compound these challenges. To mitigate these impacts, it is crucial to implement climate-resilient livestock practices, such as improved breeding, vaccination, and feeding strategies. Additionally, policies and programs should be designed to support rural communities in adapting to climate change and building resilience.

Conclusion and Implication

The study reveals that climate change is significantly impacting livestock-centric rural development. A majority of respondents reported moderate to severe impacts on livestock health, productivity, and overall livelihoods. This underscores the urgent need for adaptive strategies to mitigate these challenges. The findings highlight

the importance of adopting climate-resilient practices. These include promoting the use of climate-resilient livestock breeds, improving water management through techniques like drip irrigation, and implementing sustainable feeding practices to ensure adequate nutrition for livestock. Additionally, strengthening policy support and promoting the adoption of climate-smart agricultural technologies are crucial for building resilience in rural communities. By addressing these issues, it is possible to mitigate the negative impacts of climate change, enhance livestock productivity, and ensure the sustainability of rural livelihoods. Further research and continuous monitoring are necessary to refine adaptation strategies and support the long-term resilience of livestock-based systems.

Implications

The findings of this study have significant implications for policymakers, development practitioners, and researchers:

- There is an urgent need for targeted interventions to mitigate the adverse effects of climate change on livestock-centric rural development. These interventions should focus on enhancing the resilience of livestock systems, improving livestock health, and increasing productivity.
- Promoting the adoption of climate-smart agricultural practices, such as improved breeding, vaccination, and feeding strategies, is crucial to enhance the resilience of livestock systems.
- Strong policy support is essential to facilitate the transition to sustainable livestock practices. Governments should develop and implement policies that incentivize climate-resilient agriculture, provide financial support, and create enabling environments for farmers.
- Investing in capacity building and knowledge transfer is crucial to empower farmers and communities to adapt to climate change. This includes training programs on climate-smart agriculture, access to information and technology, and financial literacy.
- Continued research and monitoring are necessary to understand the evolving impacts of climate change on livestock systems and to refine adaptation strategies.

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Original Research Article

Financial Literacy and Women Empowerment in Chitwan

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Abstract

In this study, the relationship between Financial Literacy and Women's Empowerment is investigated. In order to investigate women's empowerment with age and education serving as moderating variables, the scholar used Financial Literacy (Financial Knowledge, Financial Skill, Financial Behaviour, Financial Attitude, and Financial Awareness) as independent variables. 385 samples were taken using the purposive sampling technique, and data were gathered from individuals in the 18–44 age range using a structured questionnaire survey. SPSS, a statistical analysis program, was used to examine the data. Descriptive analysis and inferential analysis for association and proposition testing are the proper statistical techniques used in research. The results of the study demonstrate a negative and substantial relationship between women's empowerment and financial knowledge and abilities. Additionally, there is a strong and positive correlation between women's employment and financial conduct, attitude, and awareness. Moreover, there is a strong and positive correlation between moderating age and education variables. The research findings establish the critical role that financial literacy plays in promoting gender equality and raising the socioeconomic standing of women.

Keywords: *Financial Knowledge, Financial Skills, Financial Knowledge, Financial Attitude, Financial Behavior, Women Empowerment*

Introduction

In today's society, financial literacy has emerged as a critical factor influencing women's empowerment and gender parity. Research has repeatedly demonstrated that compared to their male counterparts, women often have lesser financial literacy

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and engage in fewer economic activities. In addition to having an effect on women's personal financial security, this disparity contributes to broader gender disparities in the economy, impeding the achievement of sustainable development goals. More than simply basic reading and math abilities are included in financial literacy. Understanding, behaviour, attitudes, perception, and general awareness of the financial environment are all included in this wide field of study.

According to Kabeer (2005), the phrase "women's empowerment" is wide and includes the advancement of women's activity, freedom, and participation in policymaking across a range of societal domains. In order to enable women to take control of their lives and positively impact society, it means giving them the means, instruments, and chances to confront and subvert discriminatory norms and gender-based disparities.

In addition, the emergence of digital technology has created new avenues for improving women's financial literacy. According to recent research (Haliassos et al., 2022; Jappelli & Padula, 2019), digital platforms and online resources can effectively bridge the knowledge gap between women and finance by offering accessible and customised financial education.

Thus, there have been a rising number of financial crises in both established and emerging countries in recent years as a result of the quick change in the financial environment. Financial literacy enables consumers to evaluate products and make well-informed decisions by educating and enticing them with knowledge that will have a substantial impact on their life (Wachira & Kihiu, 2012).

Chaulagain and Devkota (2018) express worry about the potential for a mutually reinforcing connection between financial literacy and women's empowerment as a strategy of uplifting marginalised Nepalese individuals. According to Ali et al. (2021), women's education may be strengthened through mindfulness programs. Women's confidence grows as financial education advances, enabling women to question traditional orientation roles, assert their independence, and plan for financial opportunities (Lusardi & Mitchell, 2014). Hence, empowered women are more likely to engage in financial education and put their skills to use, maintaining the upward trend. This oddity transcends personal wealth since financially involved women may collectively contribute to the economic development of their families, communities, and nations.

Despite the fact that there has been a great deal of research focusing on the importance of financial education, it is frequently maybe the most overlooked component contributing to the financial advancement of women in Nepal. Most members of the group want to see the financial standing of women continue to rise. For instance, in Nepal, the financial literacy of women is 17.9 % greater than that of men (NRB, 2022). It is another cause why the association can strengthen the women even more.

A higher level of life may be achieved via effective financial knowledge acquisition through financial literacy. Furthermore, studies conducted recently have emphasised the significance of incorporating digital financial literacy into the comprehension of women's empowerment in the digital age. These studies emphasise the necessity of analysing the effects of technological innovations on women's financial activity and financial inclusion (Vegas et al., 2021; Goyal & Sahn, 2017). In this case, financial illiteracy is not exclusive to Nepal; rather, it is an issue that affects many different demographic groups globally, irrespective of economic progress.

Even while the data now available points to a positive correlation, more investigation is required to separate the roles played by institutional impediments, cultural norms, and socio-demographic variables. The purpose of the study is to evaluate how financial behaviour, awareness, knowledge, and skills relate to the empowerment of women in Nepal. The purpose of the study is to draw attention to how crucial financial literacy is for the nation's female families and enterprises. Anticipated outcomes have the potential to furnish significant insights into Nepal's unique characteristics and stimulate more investigation in this crucial domain.

Therefore, the objective of this study was to look at the connection between financial literacy and women's employment.

1. Regarding women's empowerment, what is the status of financial literacy?
2. What are the aspects of financial literacy that affect empowerment of women?

Examining the connection between financial literacy and women's empowerment is the study's main goal. Thus, the following are the study's precise objectives:

1. To assess the current state of women's empowerment and financial literacy.
2. To examine the impact of women's empowerment and financial literacy.

Literature Review

Raman (2022), among the main rising economies, India has the lowest rate of financial literacy, which is explained by differences between states, a lack of formal education, and general ignorance. While some emerging economies have higher rates of financial literacy than others, there is still a great deal of space for improvement. According to a research by Tinghog et al. (2021), there is still a gender disparity in financial literacy even when discussing non-numerical financial matters. This implies that the disparity goes beyond numerical data and involves comprehending financial ideas that are presented in disparate ways. Furthermore, it was discovered that variations in confidence levels were not the cause of the gender disparity in financial literacy.

According to a research by Koomson et al. (2021), how the course is designed and presented has an impact on how financial literacy influences family spending. Lessons on financial literacy delivered separately have a less noticeable impact. Incorporating financial literacy training into a curriculum focused on women's empowerment, however, has a more immediate influence on household spending. Iran et al. (2021) demonstrate how loss aversion, regret aversion, mental accounting, and self-control have a significant impact on women entrepreneurs' financial literacy and investment decision-making processes.

According to Bhaskaran et al. (2021), rural women are aware of the variety of investment possibilities on the market, but familiarity, safety, and guaranteed returns have an impact on their decision-making. This report emphasises how important it is for governments to focus on raising financial awareness instead of just financial literacy programs. Islam et al.'s (2020) study explores the complex relationship between financial literacy and women's empowerment and makes the case for combining sound financial literacy with entrepreneurship to increase women's empowerment. The findings of Kumari et al. (2020) demonstrate that financial literacy significantly affects rural poor women's capacity to direct their own economic destiny. The results of the study, according to Niazi and Malik (2019), show that the respondents had a poor degree of financial knowledge.

Hypothesis of the Study

H1: Financial knowledge significantly affects women empowerment

People's attitudes towards money and financial affairs are summed up in their financial beliefs, feelings, and values, which influence how they spend, save, invest, and handle debt (NRB, 2022). Empirical studies demonstrate the connection between favourable financial attitudes—like anticipating needs and being eager to learn about personal finance—and better financial results. Decision-making is impacted by the interaction of attitudes towards risk, debt, and financial objectives; this interaction provides insights into how to encourage prudent financial decisions (Lown & Grable, 1993; Mann, 2013). Refining financial education tactics and encouraging healthy financial habits for people and families are made easier with an understanding of the relationship between financial attitudes and behaviours.

H2: Financial behaviour significantly affects women empowerment

A person's degree of comprehension and familiarity with different financial ideas, goods, and procedures is referred to as their financial awareness (NRB, 2022). It includes having knowledge of things like retirement planning, taxes, loans, investments, savings, and budgeting. People with a strong understanding of money are better able to set objectives, make well-informed decisions, and negotiate the challenges of personal finance. According to research, financial education is crucial for raising awareness and has a good effect on people's financial well-being (Hastings, Madrian, & Skimmyhorn, 2013). A greater understanding of finances enables people to organise their finances more skilfully and make decisions that support their long-term financial objectives.

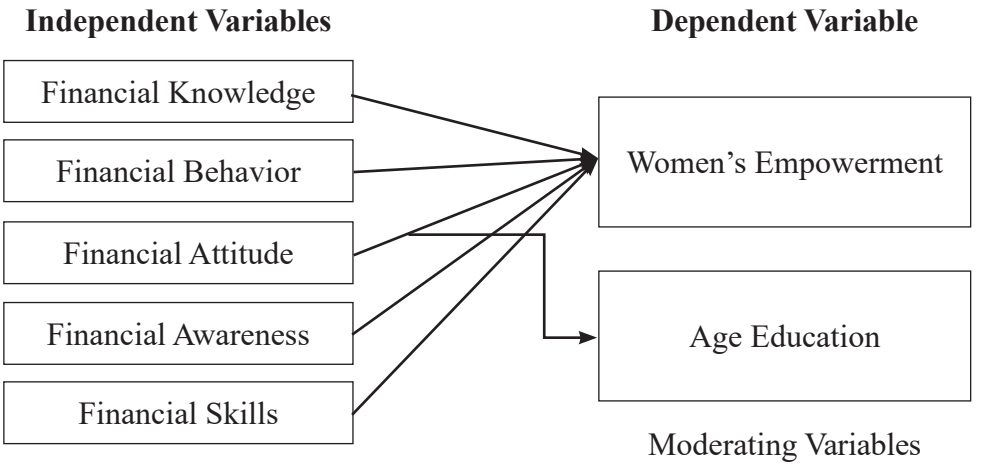
H3: Financial attitude significantly affects women empowerment

The practical aptitudes and capabilities people possess to efficiently manage their financial resources are referred to as financial skills (NRB, 2022). These abilities cover a variety of duties, such as managing debt, tracking spending, analysing financial documents, making investment decisions, and budgeting. Strong financial abilities are positively correlated with better financial outcomes, according to research, as these people are more likely to make wise financial decisions, reach their financial objectives, and overcome obstacles in their financial lives (Peng & Bartholomae, 2014). Increasing one's financial literacy through education and training provides people with the means to negotiate complicated financial environments, increasing one's economic flexibility and general comfort.

H4: Financial awareness significantly affects women empowerment.

Theoretical Framework

The study's dependent variable is women's empowerment, whereas the independent variable is financial literacy. Financial Knowledge, Financial Behaviour, Financial Attitude, and Financial Awareness are the operational definitions of financial literacy.



Research Methods

A descriptive and inferential research approach was employed in the study. This design aims to explain the facts and features related to the research problem, offer in-depth insights, and conduct a thorough examination of the research topic. These layouts are very useful for locating factual data (Cooper & Schindler, 2009).

The women people living in the Chitwan district who worked in jobs and were active in entrepreneurship, financial activities and decision-making were the population of this study. The research has a sample size of 385. Purposive sampling, or non-probability sampling, was used in this investigation. Purposive sampling involves choosing participants based on predetermined standards that match the goals of the study, such as women who actively make financial decisions and businesses who take part in microfinance programs. Primary data gathering was employed in the study. In order to get quantitative data, a structured questionnaire was used to collect primary data.

Results and Findings

To determine relationships between the variables, correlation analysis was examined. For variables with straightforward multi-option answers, Pearson's correlation analysis was performed. The degree of association between the research variables was evaluated by computing a correlation matrix. When two variables increase in response to each other's increase, there is a positive correlation, indicating that the relationship is positive in direction.

Table 1

Correlation Coefficients

	WE	FK	FB	FA	FW	FS
WE	1					
FK	.17**	1				
FB	.27**	.23**	1			
FA	.40**	.39**	.15**	1		
FW	.53**	.49**	.16**	.51**	1	
FS	.16**	.39**	.03	.27**	.52**	1

**. Correlation is significant at the 0.01 level (2-tailed).

(Source: Calculated by using SPSS)

Relationship between women empowerment and financial knowledge

Women Empowerment (WE) and Financial Knowledge (FK) have a 0.17 association coefficient. This positive correlation implies that people's degrees of women's empowerment tend to rise along with their level of financial literacy. The correlation is minimal even though it is statistically significant ($p = 0.001$).

Relationship between women empowerment and financial behavior

A moderately good association is indicated by the correlation coefficient of 0.27 between WE and Financial Behaviour (FB). This implies that people who engage in more advantageous financial practices typically have greater degrees of women's empowerment. At $p = 0.000$, the association is statistically significant.

Relationship between women empowerment and financial attitude

The relationship between WE and Financial Attitude (FA) has a 0.40 correlation coefficient. People who have more positive financial attitudes are more likely to have higher degrees of women's empowerment, according to this moderate to strong positive correlation. At p = 0.000, the association is very statistically significant.

Relationship between women empowerment and financial awareness

There is a strong positive correlation (r = 0.53) between WE and Financial Awareness (FW). This implies that people who are more financially conscious typically display higher degrees of women's empowerment. One of the strongest correlations in the table, the correlation is highly statistically significant (p = 0.000).

Relationship between women empowerment and financial skill

Indicating a comparatively weak positive relationship, the correlation between WE and Financial Skill (FS) is 0.16. This implies that although the relationship is not as strong as it is with other financial factors, people who are more financially literate also tend to be somewhat more empowered women. The correlation coefficient (p = 0.002) indicates statistical significance.

Multiple Regression Analysis

The aim of multiple regression is to model the relationship between the variables so as to facilitate testing hypotheses, making predictions, and providing an explanation.

Table 2

Model Summary

Model	R	R square	Adjusted R square	Std. Error of estimate
1	.61	.38	.37	.44

Predictors: (Constant), FK, FB, FA, FW, and FS

(Source: Calculated by using SPSS)

Table 2, which displays the model summary, shows the coefficient of determination, or R-square, which is a useful tool for explaining variance. 0.38 is the R-square value. Independent variables (FK, FB, FA, FW, and FS) account for 38%

of the variation in investment decisions. That still leaves 62% (100 percent - 38%) of the findings in this study unexplained.

Table 3

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.84	5	8.97	45.83	.00
	Residual	74.16	379	.19		
	Total	118.99	384			

a. Dependent Variable: WE

b. Predictors: (Constant), FS, FB, FA, FK, FW

(Source: Calculated by using SPSS)

The regression model, which includes the predictors FA (Financial Attitude), FB (Financial Behavior), FK (Financial Knowledge), and FW (Financial Awareness), is highly statistically significant ($F = 45.83$, $p < 0.001$), according to ANOVA table 3. This suggests that the dependent variable, WE (Women Empowerment), is significantly influenced by at least one of these financial factors. The large sum of squares for the regression (44.84) in comparison to the residual sum of squares (74.16) indicates that the model accounts for a significant amount of the variance in WE. These findings show that the financial variables taken as a whole are highly significant in predicting the levels of women's empowerment.

A group of statistics that are used to estimate the relationship between the independent and dependent subjects. Since this analysis is conducted under more than two variables, the results are displayed as follows.

Table 4

Multiple regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.86	.25		7.36	.00
	FK	-.13	.04	-.17	-3.55	.00
	FB	.23	.045	.20	4.77	.00
	FA	.19	.05	.19	4.05	.00
	FW	.32	.03	.55	9.89	.00
	FS	-.07	.03	-.11	-2.34	.02

a. Dependent Variable: Women Empowerment

(Source: Calculated by using SPSS)

The "Constant" component in Table 4 indicates the estimated value of WE when all independent variables are zero. In the context of unstandardised coefficients, this value is 1.86. The standardised measure of the contribution of each independent variable to the WE prediction for the standardised coefficients is called beta. Financial Awareness (FW), with a value of 0.55, is the highest of the predictors. This suggests that an increase in FW of one standard deviation is correlated with an increase in women's empowerment of 0.55 standard deviations. Furthermore, all three financial domains—financial behaviour, financial attitude, and financial knowledge—show positive values, indicating a favourable correlation between the level of women's empowerment and advances in these financial domains.

FS (Financial Skill) is negative (-0.11), suggesting that a rise in financial skill is correlationed to a fall in women's empowerment, however this effect is much smaller than that of the other predictors. It is noteworthy that each of these financial indicators strongly contributes to predicting women's empowerment, as indicated by the extremely low significance values (Sig.) correlationed with each coefficient (all < 0.05) in their t-statistics.

Moderating of Age

Table 5

One way ANOVA test of Age with women empowerment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.81	3	1.27	4.19	.01
Within Groups	115.19	381	.30		
Total	118.99	384			

(Source: Calculated by using SPSS)

The analysis of variance (ANOVA) presented in Table 5 indicates that there are statistically significant differences in the Women Empowerment (WE) ratings among the four distinct age groups. There is a statistically significant difference between the groups in terms of their Women Empowerment scores, as indicated by the between-groups variation ($F = 4.19$, $p = 0.01$). This shows that different conditions or factors are causing differences in women's empowerment across the dataset.

Moderating of Education

This table illustrates how women's empowerment and education are moderating each other.

Table 6

One way ANOVA test of education

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.38	2	2.69	9.04	.00
Within Groups	113.62	382	.29		
Total	118.99	384			

(Source: Calculated by using SPSS)

Table 6 presents statistically significant variations in the dependent variable (not included in the table) between different groups or categories. The significant sum of squares within groups (113.62) compared to between groups (5.38) indicates that the differences between these groups may account for a sizable amount of the variation in the dependent variable. The statistical significance of these differences is supported

by the F-statistic of 9.04, with a corresponding p-value of 0.00, which shows that the groups or categories under comparison have unique traits or contributing variables to changes in the dependent variable. To identify the precise conditions or groups causing these notable variations, more research or post hoc testing would be required.

Discussions and Conclusion

The findings indicate a significant and negative relationship between financial knowledge and empowerment, with a beta coefficient of -0.135 and a p-value of 0.00<0.05. Thus, a decline in women's empowerment is caused by an increase in financial knowledge. The findings, therefore, are inconsistent with those of (Abinfin et al., 2023), (Raman, 2022), and (Ali et al., 2021), which demonstrate the favourable connection with empowerment.

Studies by Abindin et al. (2023), Raman (2022), and Ali et al. (2021) demonstrate the beneficial association with empowerment. Therefore, there is a positive and significant association between financial behaviour and women's empowerment. This relationship differs from Rachmadini and Damayanti's (2023) finding of an insignificant relationship with empowerment, with a beta coefficient of 0.23 and a p value of 0.00<0.05.

Regression analysis demonstrates a positive and significant relationship between financial attitude and women's empowerment, with a beta coefficient of 0.198 and a P-value of 0.00<0.05. It implies that as financial attitudes rise, so does women's empowerment. Accordingly, studies conducted by Abinfin et al. (2023), Struckel et al. (2022), and Ali et al. (2021) have indicated that women who possess greater financial literacy are more likely to work for themselves.

The findings indicate a positive and statistically significant association between financial awareness and women's empowerment, with a beta coefficient of 0.324 and a P-value of 0.00<0.05. Thus, the outcome is comparable to that of Streckell et al. (2022) and Raman et al. (2022).it increases women's empowerment as financial understanding rises.

The findings indicate a statistically significant negative relationship (beta coefficient of -0.072 and P-value of 0.020) between financial skill and women's empowerment. The findings, therefore, are consistent with those of Rachmadini and

Damayanti (2023) and divergent from those of Abindin et al. (2023), Mishra, Pham, Cavaliera, et al. (2022), Struckell et al. (2022), and Ali et al. (2021), demonstrating a favourable influence on empowerment.

The moderating variables indicate that age and education are important factors in raising financial literacy. There appears to be a strong positive correlation between financial knowledge and women's empowerment. The findings indicate that financial literacy and empowerment rise with age and education.

Among the financial variables examined, it was found that financial behaviour, financial attitude, financial awareness, and financial skill had a significant and beneficial impact on women's empowerment. This implies that women's empowerment may be greatly increased by encouraging good financial habits, developing a positive financial mindset, raising financial awareness, and improving financial skills. These results offer organizations and legislators useful information for creating successful empowerment initiatives. In addition, one of the study's goals was to evaluate how demographic factors affected women's empowerment. Although the precise results about the demographic parameters are not provided, this goal emphasises how crucial it is to customise empowering tactics for certain populations. Developing contextually appropriate and successful empowerment programs requires an awareness of the variety of women as well as a comprehension of the ways in which demographic factors intersect with financial literacy.

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