Spatial and Temporal Voting Patterns in 2017 and 2022 in Nepal

Jayanti Karki, Chhabi Lal Chidi[ID], Puspa Sharma[ID]*

Central Department of Geography, Tribhuvan University, Kathmandu, Nepal.
*Corresponding email: puspa.sharma@cdg.tu.edu.np

Abstract

The present study analyses the spatial distribution patterns of voting and vote differences, and gender composition based on the results of the direct elections by the eligible people at three levels, viz. House of Representatives, Provincial Assembly, and Local Units in Nepal conducted in the years of 2017 and 2022. The study also analyzes the spatial voting patterns of major parties such as the Nepali Congress, the United Marxist Leninist, and the Maoist Center by the rural-urban and three ecological regions. Based on the data published by the Election Commission of Nepal, three methods such as the contiguity technique, quadrant technique, and chi-square test of independence have been used for finding the spatial voting patterns. While the GIS technique has been used to measure the contiguity and quadrant analysis, SPSS has been used to get chi-square values. The results of the election data show that the spatial pattern of the three major political parties differed remarkably at the three government levels between the two election years. At the individual party level, the party, who got the largest number of votes in the 2017 election for making government, did not get the same result in the 2022 election. Further, none of those three large major parties could get the required size of votes for making governments at all three levels. Thus, the analysis reveals mixed patterns of spatial and temporal voting distribution in Nepal.

Keywords: Spatial distribution, voting pattern, contiguity measures, quadrant analysis, chi-square

Introduction

Electoral geography, an intriguing subfield within the extensive discipline of political geography, which itself is an essential branch of human geography, examines the complex

geographical dimensions of elections (Adhikari, 1999; Varma, 2022). Each geographic space has unique features such as notable characteristics, significant attractions, varied functions and resources, and influential power dynamics, which are often distributed unevenly across the entire regions in the world. These diverse attributes contribute to the individuality and distinctiveness of each geographic space. The notable role, inherent value, and substantial influence of the spaces profoundly affect the shaping of human thought, influencing their behaviors, and guiding their functions. Elections serve as a fundamental mechanism for the allocation of power, making decisions, formulation of policies, and establishment of goals within these influential spatial paradigms (Kavinanirad & Rasouli, 2015). The overall goal of the election is to develop the electoral districts or regions by the elected governments. Based on these frameworks, this paper aims to analyze the spatial patterns of three large political parties of Nepal, viz. Nepali Congress (NC), United Marxist Leninist (UML), and Maoist Center (MC) by the rural and urban regions and by the three ecological regions such as mountain, hill and Tarai, exploring the gender composition, and looking into the voting disparities between the first and the second political parties at three government levels, viz. House of Representatives (HoR), State or Provincial Assembly (SA), and Local Units (urban and rural municipalities) between two election years of 2017 and 2022.

Over the period of six decades, Nepal has adopted six different constitutions. The interim constitution underwent revisions eight times in three and a half years. In 2007, the Unified Communist Party of Nepal (UCPN)-Maoists concluded their conflict by signing peace agreements and extending the interim constitution. Subsequently, the Seven Party Alliance declared Nepal a secular state, abolished the monarchy, and shifted army control to civilian authorities in 2008. An election for drafting a new constitution, involving 601 Constituent Assembly (CA) members, was held in 2008 (Dahal, 2010). The initial CA election, dissolved in 2012, was succeeded by a second election in 2013, conducted under the same regulations as the 2008 election under the Interim Constitution of 2007. During the 2008 election, 575 members were elected—240 through First-Past-The-Post (FPTP), 335 via Proportional Representation (PR), and 26 were appointed to complete the 601-member CA (EC, 2018). The 2017 election was significant due to the successful election process, which established 753 local bodies, seven provincial assemblies, and the federal parliament (EC, 2018). Nepal was organized into 165 constituencies for the House of Representatives (HoR) election, with one constituency divided into two for the State Assembly (SA). The HoR comprised 275 members, while the SA consisted of 550 members, with a 60% election rate through FPTP and 40% through PR. Local elections were conducted using the FPTP system. The 2022 election was historic as it marked the first simultaneous nationwide voting. Local elections occurred on 13 May 2022, while the HoR and state assembly elections took place on 20 November 2022.

Subsequent by-elections were conducted on 23 April 2023 in the constituencies of Bara, Chitwan, and Tanahu (EC, 2023).

Analysis of the voting patterns is assumed to aid in showing political parties and their respective areas of influence. These patterns can be assessed through various lenses, including ecological regions and rural-urban distinctions. Concurrently, an analysis of voting disparities elucidates the competitive dynamics between political parties. The margin between the first and second ranks in votes enables predictions about electoral outcomes and offers insights into a party's strength within a given spatial context.

Given the relatively nascent development of Nepal's electoral system, there has been a limited examination of electoral geography within the Nepalese context. Shrestha *et al.,* (2020) analyzed electoral politics, focusing on shifts in voting patterns through comparable methods. In a related study, Shrestha (2020) explored the status of the Nepali Congress across all elections conducted from 1959 to 2017. Furthermore, Dahal (2010) investigated the conflict and transformation within Nepal's political system. The Carter Center undertook a comprehensive study including the analysis of the electoral environment surrounding the Constituent Assembly election and focusing on the periods before, during, and after the election day in 2008 (TCC, 2008). The Asian Report (2008) offers a succinct historical overview of democratic elections, with an emphasis on electoral systems and procedures. Rijal (1999) conducted a review of various elections held in Nepal, examining patterns of competition and alliances among political entities. Baral (1995) underscores the fluid nature of Nepalese politics, referencing fluctuations in party preferences and electoral outcomes. Koirala (2008) presents an analysis of voting behavior among Nepali voters through a spatial lens. Further, GEOC (2018) investigated voter behavior and election practices, focusing on observations spanning 40 years.

Study Area

Nepal lying in the South Asia is a landlocked country sharing its border with two giant nations, India on three sides: east, west and south, and China on the north. It is situated between latitudes of 26° 22' and 30° 27' North and longitudes of 80° 40' to 88° 12' East. The country has a total area of 147,516 km^2 extending to 128.7 km north-south wide and 885.1 km east-west long (MoLMCPA, 2020). The elevation ranges from 59 m above sea level in the south to 8848 m in the north (DoS, 1994). Its geographic features include fertile plains, as a part of the Indo-Gangetic Plain in the south, intermontane hills in the middle, and high mountains with eight of the world's ten highest peaks, including Mount Everest in the north. These diverse geographic features possess not only varying environmental resources, but also exhibit assorted people having multi-ethnic cultures.

Figure 1

Location of the Study Area
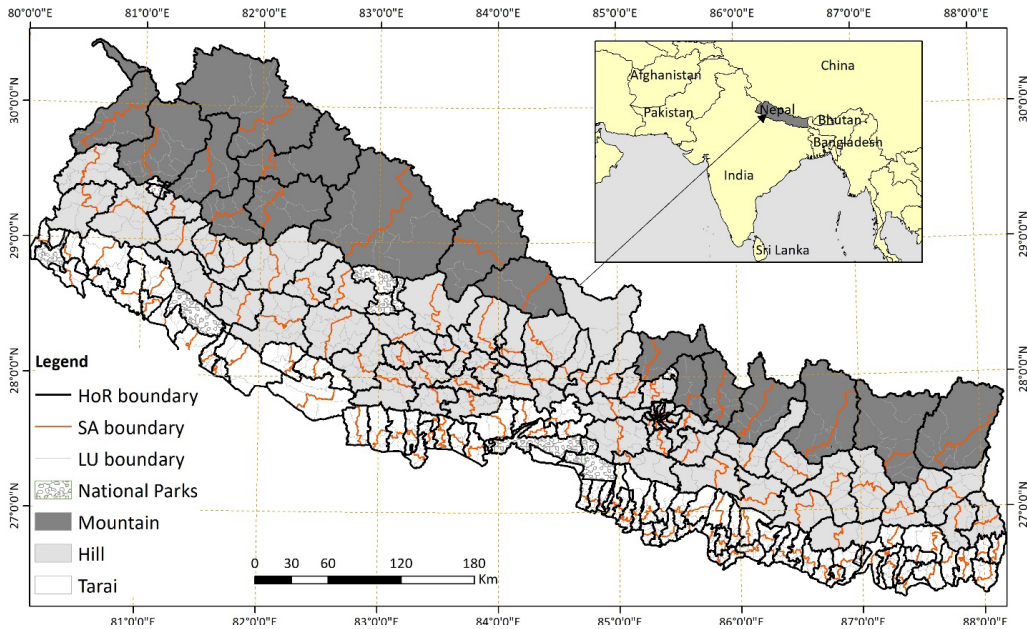
In 2015, the Local Level Restructuring Commission (LLRC) reorganized local governance into 753 units within seven provinces, including 6 metropolitan cities (*Mahanagarpalika*), 11 sub-metropolitan cities (*Upa-mahanagarpalika*), 276 urban municipalities (*Nagarpalika*), 460 rural municipalities (*Gaunpalika*) with 6743 Wards within 77 districts (LLRC, 2016; NR, 2016). The Nepali people elected 35,041 representatives to the newly formed Local Governments (LG). A Mayor and Deputy Mayor (in the case of Urban Municipalities) and a Chairperson and Vice Chairperson (in the case of Rural Municipalities) head the LG. Local units are further subdivided into wards, which are represented by a Ward Chairperson and four Ward Members. Of the four ward members, two must be women, and one of the two women must be a Dalit. All locally elected representatives comprise the Village or Municipality Assembly, which has local legislative power. In this study, only the Mayors and Chairpersons were taken for the analysis of local units' election.

The electoral division of the House of Representatives is based on the district's population size. Seventy-seven districts are subdivided into 165 units for the House of Representatives and each HoR unit is subdivided into two State Assembly (SA) with a total of 330 (CDC, 2017) (Figure 1).

Methods and Materials

Conceptual Framework

The demographic segments of the population, that engage in the electoral process and are subject to specific legal and spatial constraints, are called the electorate. These segments show particular social, economic, and demographic characteristics. The geographic location, or "space," of the target electorate exerts an influence on the electoral landscape.

Election is an intricate process whereby geographical location, electoral context, and regulations interconnect and manifest through voter behavior. Consequently, a triangular relationship exists between the electorate, spatial dimensions, and elections. The primary concern from a geographical perspective is to understand the impact of voting behavior and election outcomes within specific geographical settings. This study examines the characteristics of temporal and spatial variations in the election results or electoral patterns using an aerial approach, thus easing the generation of electoral insights. The aerial approach primarily concentrates on the spatial distribution of seats secured by major political parties. The findings are depicted through choropleth maps, which offer clear visual representations of the spatial and temporal patterns of dominant parties (Figure 2).

Figure 2

Conceptual Framework
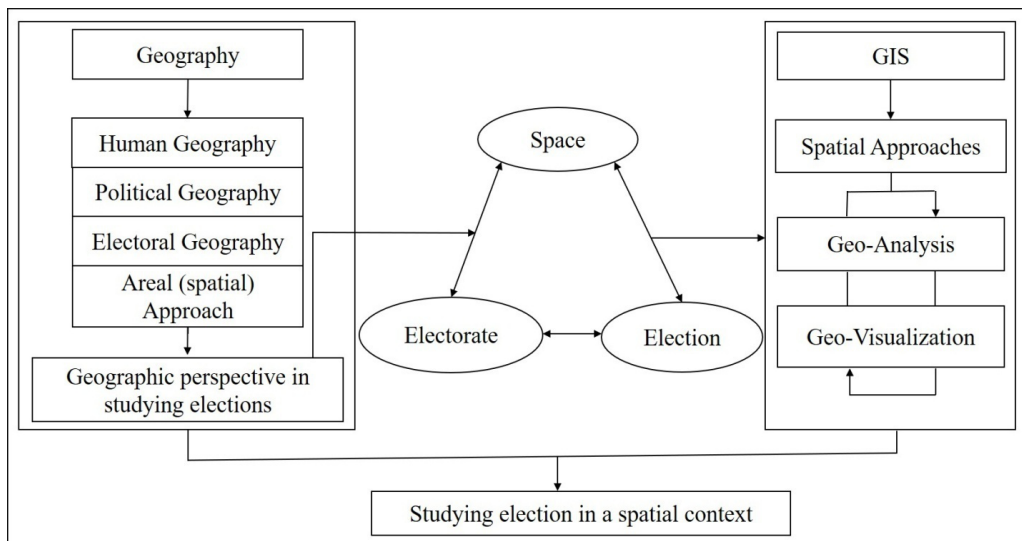
Adopted from Naturalium (2007) and modified

Data Sources

The main source of data for this paper is the election results published by the Election Commission of Nepal (www.election.gov.np). Other sources include newspaper articles, published scientific research papers and election-related reports (published and unpublished documents including web-based). The local unit boundary has been collected from the websites of the Survey Department, Ministry of Land Management, Cooperatives and Poverty Alleviation (https://dos.gov.np/), Ministry of Federal Affairs and General Administration (https://mofaga.gov.np/) and Election Commission Nepal (https://election.gov.np/). The boundaries of the House of Representatives and State Assembly within the district have been further created from the local units using GIS.

Methods of Analysis

The study is fundamentally rooted in quantitative methods. Contiguity measures, quadrant technique and Karl Pearson's chi-square test of independence analysis were employed to examine the spatial patterns. Generally, three types of spatial distribution patterns such as clustered (signifying dominated electoral districts of a particularly political party, dispersed (meaning scattered of electoral districts), and uniform (widely distributed of electoral districts) can be ascertained. These patterns often associated with the political parties having won larger seats. In addition, other sources such as secondary thematic layers were also acquired as ancillary data.

Contiguity Technique

Contiguity is evaluated based on the connectivity between regions, characterized by shared boundaries and vertices. The areal unit, consisting of homogeneous and heterogeneous categories, was computed in ArcMap using various tools, including analysis tools, proximity assessments, polygon neighbor evaluations, and the quarry method (Cam & Marie, 1960).The concept of contiguity measures is used in spatial analysis to understand the relationships between neighboring areas or units. These measures assess the connectivity of a specific areal unit with others based on their shared boundaries or adjacency. The contiguity of each areal unit with similar and dissimilar categories has been assigned. For example: "a" represents one party (e.g., UML), "b" represents another party (e.g., NC), and "Others" refers to any additional categories. L (a, b) denotes the quantity of contiguous boundaries shared by similar areal units classified in the category "A". L (a, b) represents the number of shared boundaries between the areal units belonging to category "A" with "b", "c", or other dissimilar categories. L (b, b) indicates the number of shared boundaries among areal units within category "b" itself, denoting similarity. The high contiguity with similar units (e.g., L (a, a), L (b,

b)) indicates clustering of areas with the same category. Dissimilar units (e.g., L (a, b)) suggest a mixed neighborhood. Here, "L" denotes the value of the set and "Lk" signifies the total contiguities of the areal unit, and "P(a)" is the proportion of the number of areal units in category "a" to the total number of areal units. This method is applied to identify distribution patterns of parties (UML, Maoist, and NC) for HoR and SA election units.

The contiguity technique is calculated by using the following formula:

Half of the sum of AB gives the observed number = L (a b)/2

Expected value is obtained using the given formula = Lk× P (a) ×P (b)

Quadrant Technique

Initially, the grid was developed using Geographic Information Systems (GIS). The grid cell size measures 20 km by 20 km per quadrant, within the study area's boundaries. This method partitions the study area into 447 quadrants, each encompassing an area of 400 square kilometers. The method of quadrat is among the oldest techniques in spatial pattern analysis and was first introduced by Pound and Clements in 1898 as cited by Saleem, *et.al* (2019). The area of each quadrat is calculated using the formula, double the area (2A) divided by the number of points (N): (2A/N), equating to 2 * 400 / 447 = 1.79. Consequently, each quadrant covers about 1.79 square kilometers, which is smaller than the original 2 km by 2 km size. Therefore, the analysis is confined to this methodology, focusing solely on the local unit election with a specified size (Figure 3). The quadrat method, as introduced by Pound and Clements in 1898 as cited in Saleem et al. (2019), comprises counting table records of points within the grid. This process is carried out following the same procedure using the specified formula:

 Here,

Number of quadrants $(Q) = \sum f$

Number of points $(n) = \sum f\text{x}$

Density is (mean) = n/Q

The Coefficient of dispersion C is calculated by using the (C) = Variance/mean.

The variance is the number of points per quadrant $(V) = Q(\sum f x^2) - (\sum f x)^2 / Q(Q - 1)$

## Karl-Pearson Chi-square Test of Independence

The level of significance of the Chi-square value's is figured out by employing the suitable degree of freedom, referring to the Chi-square table (Moore, 1994, as cited in

Turhan, 2020). The Chi-square test serves two primary goals: to evaluate the hypothesis of no correlation among two or more groups, populations, or criteria, and to assess the extent to which the observed value corresponds to the expected value. The Chi-square test formula is applied when obtaining the observed value (O) and expected value (E) of the same categorical data set. The expected value (E) is calculated by multiplying the row total by the column total and dividing it by the overall total (Fadden, 2020). The Chi-square distribution table provides a significant P-value; to obtain the P-value, the degree of freedom (DF) must be calculated using the formula: DF = (R-1) × (C-1). The P-value shows whether the correlation between two or more groups is statistically significant. The accepted significance level for the P-value is 0.05. If the P-value is greater than or equal to the calculated value of the Chi-square, the null hypothesis is accepted (Turhan, 2020).

The Chi-square test formula: $x^2 = \sum \dfrac{(O-E)^2}{E}$

Figure 3

Method of Quadrant Identification
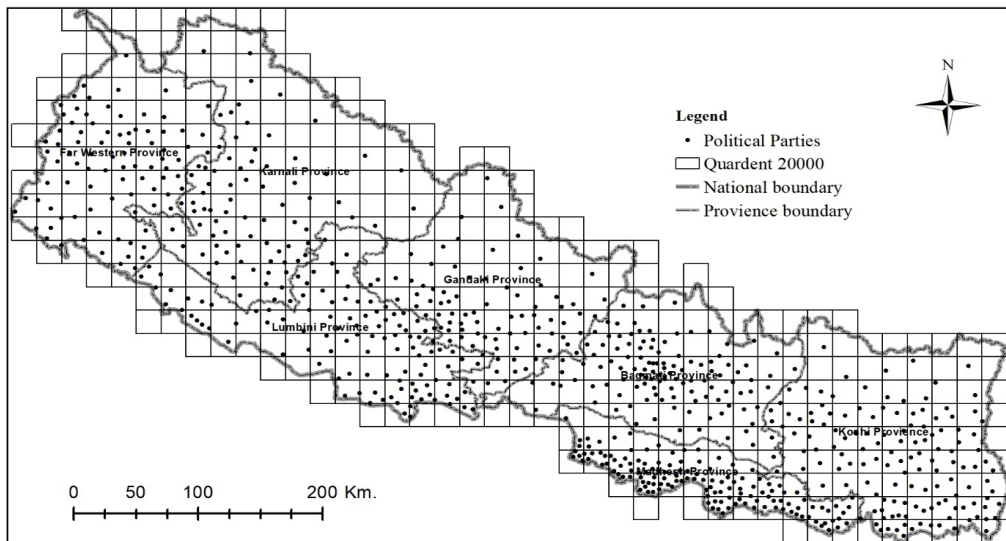
Results and Discussion

Spatial Pattern of Political Parties in Three Tires of Election

The spatial pattern of the results of the election years as depicted in Table 1 is that NC has shown a near-random pattern in the HoR elections in both years (2017 and 2022),

while MC has depicted a near-random pattern only in the election year of 2017. Unlike these, UML has exhibited a cluster pattern in both election years, whereas the cluster pattern of MC was found in 2022 only, where the observed value was lower than the expected value. In the SA election of 2022, NC and MC have shown a random pattern, indicating dispersal occupancy with NC almost equal to the expected values (Table 1). MC has shown a cluster pattern, signifying dominance in certain electoral districts in the 2017 SA election, with NC showing a close cluster pattern in the 2022 SA election, while UML has depicted a cluster pattern in the SA election of both years. In the 2017 election, UML had depicted towards clustering pattern, while in the 2022 LU election, it exhibited a uniform pattern indicating its impacts spreading over several electoral districts. In the LU elections in both years, the spatial election pattern of the NC was close to uniformity, with MC indicating a near-random pattern.

The UML lost numerous seats in the 2022 HoR election, compared to the 2017 election, with a cluster pattern in all three tires. In the 2017 HoR election, all six provinces had a cluster pattern except Madhesh province. But in the 2022 HoR election, UML's cluster voting pattern was confined only to the Koshi, Gandaki, and Lumbini provinces. In the 2022 LU election, the voting pattern for the UML appeared to have hanged into a uniform pattern in all six provinces except the Gandaki province where the party had a cluster pattern of winning votes (Figure 4).

Table 1

Spatial Pattern of Political Parties in Three Tire Elections 2017 and 2022

Party	Tires of Government	2017	2022
	HoR	Cluster	Cluster
UML	SA	Cluster	Cluster
	LU	Cluster	Uniform
	HoR	Near Random	Cluster
MC	SA	Cluster	Near Random
	LU	Uniform	Uniform
	HoR	Near Cluster	Near Random
NC	SA	Near Random	Cluster
	LU	Uniform	Cluster

Source: Karki, 2024.

Figure 4

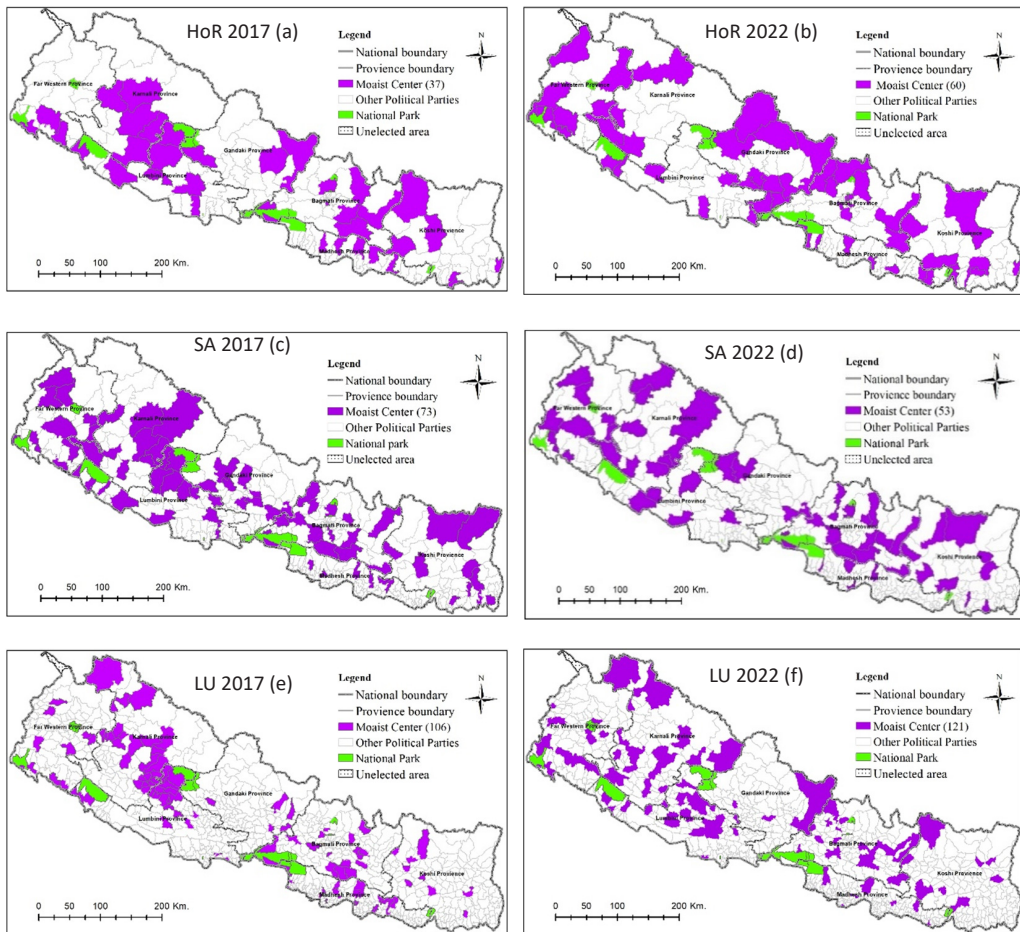*Spatial Pattern of UML in Three Tires (HoR, SA, and LU Elections) in 2017 and 2022*
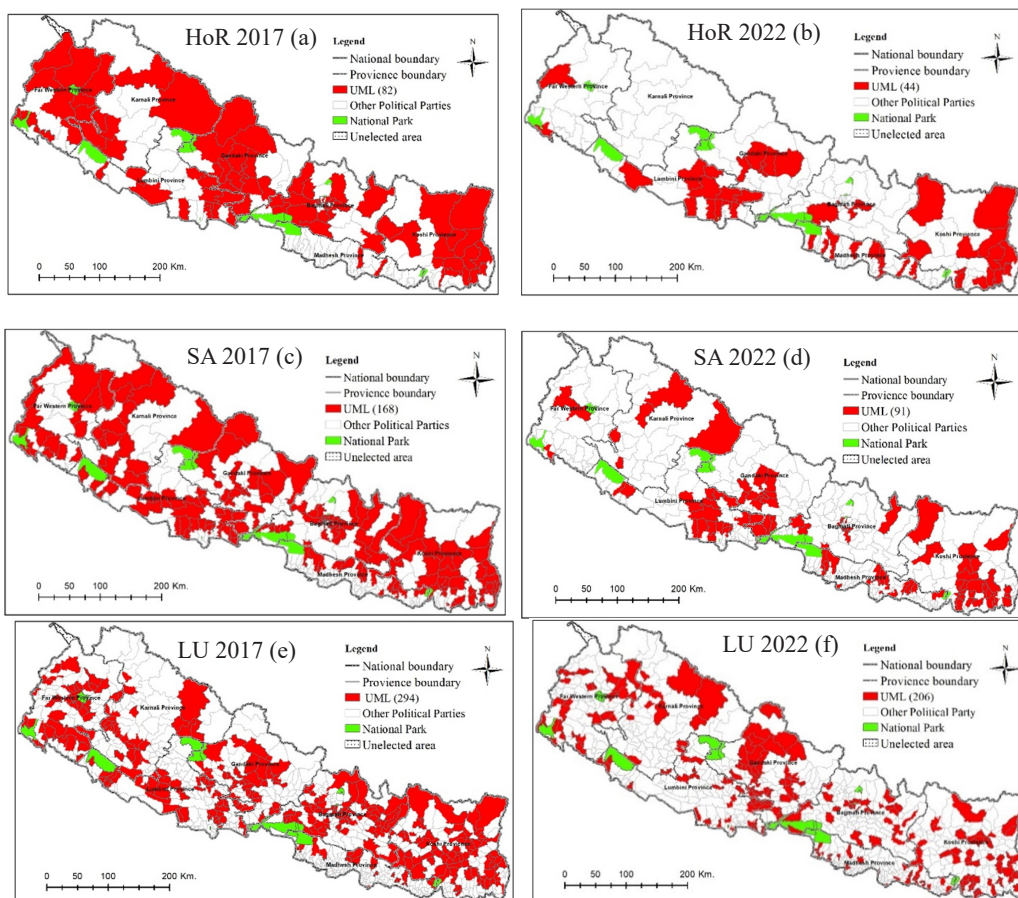
In the HoR election, the MC shifted from a near-random pattern in 2017 to a cluster pattern in 2022. In the 2017 HoR election, however the MC party had greater seat coverage in three provinces, viz. Karnali, Lumbini, and Bagmati. This party in the 2022 HoR election had won fewer seats than in the previous election but the seat coverage was spread nationwide. In the SA election nationwide, the MC had shown cluster or concentrated pattern of winning votes in 2017 but that changed to a near-uniform pattern in the 2022 election. At the provincial level, this party had depicted more clustered pattern in Karnali and Lumbini provinces in the 2017 SA election, In the case of total seats in 2022, the number won by this party decreased in Gandaki, Lumbini, and Madhesh compared to other provinces.

In the LU election, the MC had maintained uniform pattern in both election years. In the 2017 LU election, this party had less coverage in four provinces except Karnali, Bagmati, and Lumbini. While in the 2022 LU election, its coverage increased countrywide except in Gandaki (Figure 5).

Figure 5

*Spatial Pattern of MC in Three Tires (HoR, SA, and LU) in 2017 and 2022*

Unlike the two parties as stated above, NC had depicted a different pattern of winning HoR seats in both election years. It exhibited near-random pattern in the 2017 election and near-cluster patterns in the 2022 election (Table 3). There was not a single seat won by this party in the Karnali province in the 2017 election and it had won only one seat in each of Bagmati, Gandaki, and Far-Western provinces. But its seat coverage increased

significantly nationwide in the 2022 SA election. A near-random pattern was observed in the 2017 SA election, shifting to a cluster pattern in Bagmati, Gandaki, Karnali, and Far-Western provinces in 2022. In the LU election, the seat pattern won by this party changed from uniform in 2017 to cluster countrywide in 2022 (Figure 6).

Figure 6

Spatial Pattern of NC in Three Tiers (HoR, SA, and LU) in 2017 and 2022
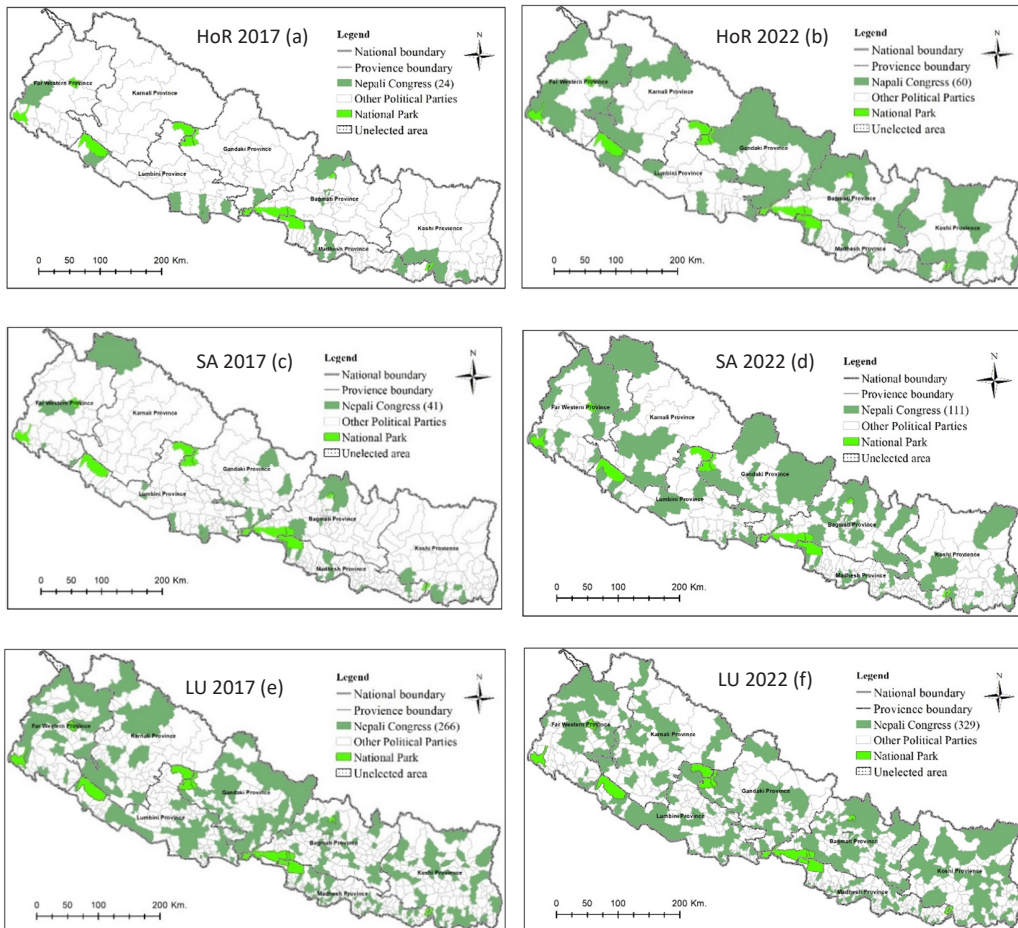
Vote Differences in HoR, SA, and LU Elections, 2017 and 2022

Vote differences can be used to predict the future outcome of the election. The minimum the difference in the votes, the higher the chance to be in power in the next election, and

the maximum the difference in votes, the less the chance to be in power in the future election.

There was a significant change in the vote differences among the three parties between the two election years. Overall, the vote differences in the 2022 election at the constituency level, five categories, viz. below 1%, 1-5%, 6-10%, 11-15% and above 15% were obtained, in which there was an increase by 10, 10, 2, and 8 constituencies respectively in all first four categories, while the category above 15% experienced a decrease of 20 constituencies (Figure 7a).

The constituency with the smallest vote margin between the two parties in the 2017 election was Panchthar-1, with a margin of only 46 votes, while in the 2022 election, Humla-1 showed the narrowest vote gap with 47 votes. Conversely, Chitwan-2 recorded the largest vote gap at 62% in 2017, and Dolpa-1 had a 57% vote gap in 2022. In 2017, three constituencies showed a more than 50% vote difference, while in 2022, this was seen in two constituencies. The provinces of Koshi, Bagmati, Lumbini, and Karnali experienced the greatest vote differences in the 2017 HoR election, while the Madesh, Gandaki, and Far-Western provinces saw the least. In the 2022 HoR election, the Karnali and Bagmati provinces had shown the highest vote differences, while the provinces of Gandaki, Koshi, Madesh, Lumbini, and Far Western had the smallest vote differences.

Figure 7

*Vote Differences in the HoR [a] and SA Elections [b], 2017 and 2022*
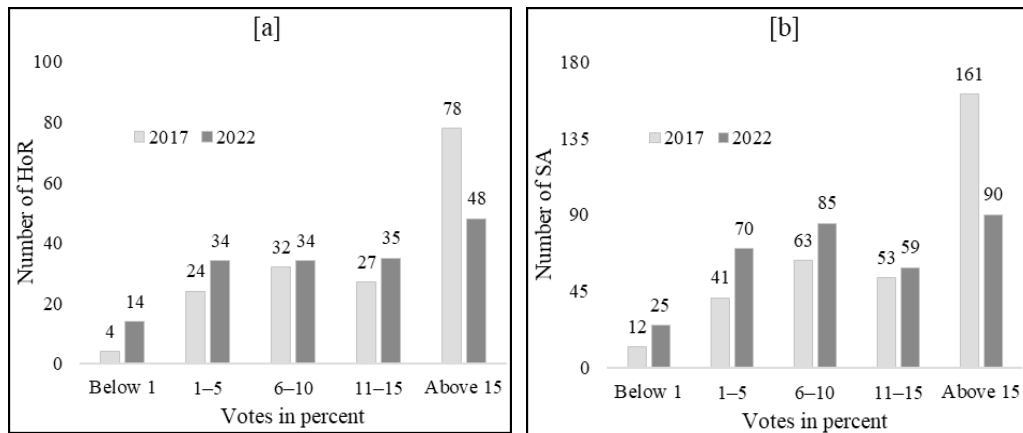
The vote differences in the SA election in 2017 and 2022 show a quite different scenario from that of the HoR elections. In the 2022 election, there were remarkable differences

in the increase of the SA constituencies by 13, 29, 22, and 20 respectively in four classes, viz. below 1%, 1-5%, 6-10%, and 11-15%. The vote difference above 15% decreased by 71. In the 2022 SA election, there was unopposed in constituency 2 of Manang-1. The smallest differences were five votes in Tanahu-2, constituency-1 in 2017 while there were three votes in Kavrepalanchok-1, constituency-2 in 2022. The largest differences were 91% in Myagdi-1, constituency-3 in 2017, whereas it was 80% in Bhaktapur-1, constituency-2 in 2022. Five constituencies exceeded a 50% difference in both election years. In 2017, the smallest differences were in Gandaki and Far Western regions, with the largest in the Koshi, Madesh, Bagmati, Lumbini, and Karnali provinces. In 2022, the smallest vote differences were in Koshi, Gandaki, Lumbini, and Far Western provinces while the largest differences were associated with the Madesh, Bagmati, and Karnali provinces (Figure 7b).

Figure 8

Vote Differences in LU Elections, 2017 and 2022
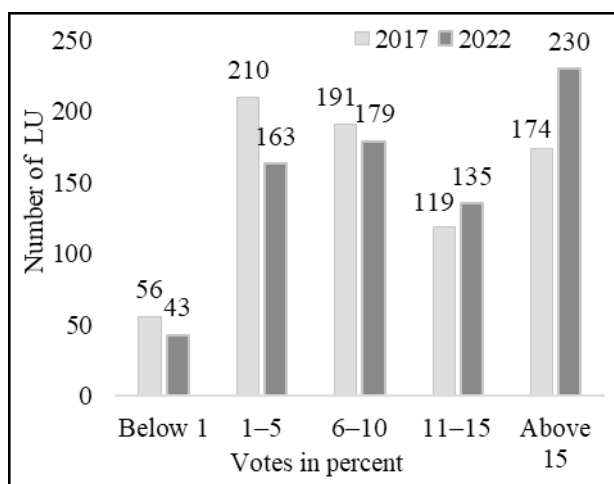
During the 2017 elections, two *Gaunpalikas* (rural municipalities) comprising SheyPhoksundo in Dolpa and Narphu in Manang district faced no opposition. Similarly, in 2022, three *Gaunpalikas*, namely SheyPhoksundo, Kaike, and ChharkaTangsong of Dolpadistrict were unopposed. There was a quite different vote scenario between the 2017 and 2022 LU elections. In the 2017 LU election, for instance, five out of seven provinces showed the highest vote differences. But there was an enhancement in the vote differences nationwide in the 2022 LU election compared to the same in the 2017 elections, except in Gandaki Province, where there was the largest vote difference in the LU elections (Figure 8).

Overall, compared to 2017, the UML experienced a reduction in its candidates, while the NC achieved a greater number of candidates than in 2017 in three tires of elections. Despite a decline in the number of candidates held by MC in the 2022 provincial elections relative to 2017, there appears to be an increase in the representation of other LU and HoR representatives (Table 2).

Table 2

Gain and Losses of Candidates of HoR, SA and LU Elections, 2017 and 2022 by Three Parties

Major Party	Election unit	% of elected candidates		
		2017	2022	Differences
	HoR	49.7	26.7	-23
UML	SA	73	39.6	-33.5
	LU	39	27.4	-11.7
	HoR	14.5	36.4	21.8
NC	SA	17.8	48.3	30.4
	LU	35.3	43.7	8.4
	HoR	22.4	36.4	13.9
MC	SA	31.7	23	-8.7
	LU	14.1	16.1	2

The results acquired by the chi-square method in Table 3 reveal a great association in sex composition between rural-urban areas. In the 2017 LU election, the chi-square ($\chi2$) values for the rural and urban regions were 1.261 and 2.701 respectively. Analogously, for the 2022 election, the chi-square values for the rural and urban areas were recorded at 0.978 and 2.398 respectively. These chi-square results were below the critical thresholds at $p < 0.05$ and $p < 0.1$, which equated to 5.991 and 4.605 respectively, with a degree of freedom (df) of 2. Thus, the null hypothesis is accepted, showing a correlation between gender and rural-urban composition.

In the case of the ecological region, the analysis displayed a meaningful association with the sex composition in the local elections in both years of 2017 and 2022. For the 2022 election, the chi-square statistics ($\chi2$) for the Mountain, Hill, and Tarai regions were 0.265, 0.181, and 2.606 respectively. Conversely, for the 2017 election, the chi-square statistics ($\chi2$) for Hill and Tarai were 2.449 and 1.03 respectively. These chi-square statistics were still lower than the critical values (p) of 0.05 and 0.1, positioned at 5.991 and 4.605, with a degree of freedom of 2. Thus, the null hypothesis was accepted,

signifying a relationship between the gender composition and the ecological regions. The findings from the chi-square test, as depicted in Table 4, showed a significant association between sex composition and the three electoral levels (HoR, SA, and LU elections) in both years of 2017 and 2022. The chi-square value ($\chi2$) for the LU in 2017 was 1.853, while in 2022, the values for the LU, SA, and HoR elections were 2.413, 1.1769, and 3.011 respectively. These chi-square values were below the critical thresholds (p) of 0.05 and 0.1, equating to 5.991 and 4.605, with a degree of freedom (df) of 2. Therefore, the null hypothesis was accepted, demonstrating a relationship between gender and the levels of elections (HoR, SA, and LU elections).

Table 3

Rural-urban, Ecological Region, LU, SA, and HoR Sex Composition in 2017 and 2022

Rural/Urban	2017			2022		
	$\chi2$	df	P - value	$\chi2$	df	P - value
Rural	1.261	2	0.523	0.978	2	0.953
Urban	2.701	2	0.59	2.398	2	0.301
Ecological region						
Mountain				0.265	2	0.987
Hill	2.449	2	0.294	0.181	2	0.913
Tarai	1.03	2	0.598	2.606	2	0.272
Tires of government						
LU	1.953	2	0.377	2.413	2	0.29
SA				1.769	2	0.413
HoR				3.011	2	0.222

Source: Karki, 2024.

Discussion

Studies carried out across different countries of the World reveal that voting behavior is shaped by individual attitudes and socioeconomic, ethnic, and psychological determinants, with variables such as age, gender, culture, and political campaigns serving as pivotal elements (Kerekes, 2020; Tamas, 2019; Allison, 2013; Giugal, 2013; Antunes, 2010; Aiba, 2002; Visser, 1996). Likewise, voting patterns are influenced by political environments and have a reciprocal effect on behavior (Lee & Repkine, 2022; Kavianirad & Rasouli, 2015). Further, the voting pattern is also influenced by the coalition of different participated political parties in the election. It is often seen that different political parties contest with their own capacity or separately, and later

if a single party did not get an adequate number of seats to form the government, then two or more participated political parties having likely mindset will be allied in order to get a required number of seats for making government. Unlike this, in case of Nepal, two or more political parties got to be allied for the election. It is unnatural because voters get to be confused to vote to which party, as there is a distinctive voting sign or symbol for each of the contested party. There is a tradition that every established or renowned political party has its own party sign or symbol. People know the party by its symbol. In the election, the same sign or symbol will often be given to the party. In case of coalition, hardline cadres of the particular party, as well as the well aware people having knowledge of the party's sign have to vote on sign of other allied party. This is confusion. The ultimate goal is to get adequate vote to form the government. In such case, winning candidates of a particular political party are often found to be diverted from what they told or promised to perform development activities or facilities in their electoral district during the election campaign. In other words, this is a cheating or disloyal to the people or against the democratic political system. Other factors such as poverty, illiteracy, geographical terrains, poor infrastructure, etc are assumed to be existed to affect in the voting pattern in Nepal. The rise in the number of constituencies exhibiting a reduced margin between the leading and secondary candidates (or parties) in the vote distribution may be attributed to several factors, including voter absenteeism, migration, a decline in party enthusiasm, and attraction toward an emerging party and frustration towards the old parties.

As a result, the spatial voting pattern in both election years is complex and away from the general prediction. Apart from the factors as described above, this factor appears to be very dominant in case of the three largest political parties, as the MC formed alliance with the UML in the 2017 election while the same MC allied with the NC in the 2022 election particularly at the HoR level across the country. This is a newly emerged practice in Nepal and hope the major parties would not do this in the forthcoming election.

Conclusion

There is a change in the governmental leadership in each of the two elections, a shift in voting preferences, and an alteration in spatial voting patterns across all districts of Nepal. A significant and potentially transformative shift in public sentiment has resulted in changes in electoral behavior. The electorate appears to be expressing dissatisfaction with the performance of the traditional large political parties and their entities, thereby seeking alternatives or changes within the political landscape. For instance, in the 2022 local elections, major cities of Nepal such as Kathmandu, Dharan, and Dhangadi have demonstrated quite different election outcomes, with independent candidates secured election victory in the Mayer position. This reflects a clear public disaffection towards

the dominant political parties and their poor performance. The voting patterns in the election of both years were influenced by the alliance among the major political parties. The pattern scenario might have been different had there been no party alliances for the elections. The difference in vote ratio between winning candidates and immediate losing the next candidates in the election indicates the degree of competitiveness. There is a gradual tendency of decreasing vote differences between the candidates of major political parties at all three levels. This is a good indication of competitiveness, as no individual candidate or political party has dominance, or in other words, better candidates have been nominated or selected by the political parties. Another important issue is the minimal women's participation in the direct elections in Nepal. With around 5% of female candidates participating at all election levels, which is not fair if we look at the gender composition in the national population, which is over 50%. Female candidates were overwhelmingly overshadowed and dominated by male candidates. Even in the Tarai and Mountain regions, the female representation showed extremely poor compared to the hill region in both election years. The alliance of two or more political parties for the election or making government purpose is indeed not a good democratic practice, which is simply due to lack of confidence in their own parties' performance. This is a newly emerged practice in Nepal and hope the major parties would not do this in the forthcoming election and the future governments will undertake measures for the fair participation of women and other disadvantaged groups in the election. More research is required however to get fair participation of all groups in the election and more factors affecting the voting patterns.

Acknowledgments

References

Adhikari, S. (1999). *Political geography*. Rawat Publication.

Aiba, J. (2002). Reviewing the theories of voting behaviour. *Memoirs of Nara University, 31,* 283–304.

Allison, B. K. (2013). *Ethnic politics and urban voting behavior in India: Explaining variation in electoral support for the Bharatiya Janata Party, 1999-2009*. (Unpublished Doctoral dissertation), University of Maryland. Maryland, USA. https://core.ac.uk/download/56110632.pdf. Accessed: 10.11.2024.

Antunes, R. (2010). Theoretical models of voting behaviour. *Exedra, 4*, 145–70.

Asian Report. (2008). *Nepal's election: A peaceful revolution*? International Crisis Group Working to Prevent Conflict Worldwide.

Baral, L. R. (1995). *The 1994 election: Emerging trend in party politics*. Asian Survey, 35(5), 426–440, University of California press. https://doi.org/10.2307/2645746

Cam, L., & Marie, L. (1960). Locally asymptotically normal families of distributions. *University of California Publications in Statistics, 3*(2)*,* 37–98. University of California.

CDC. (2017). *Report of the Constituency Delimitation Commission 2016*. Constituency Delimitation Commission (CDC), Kathmandu, Nepal.

Dahal, D. R. (2010). *Elections and conflict in Nepal*. International Policy Analysis.

DoS. (1994). *Topo-sheet no. 2786 04 – 1:50,000, 2685 08C and 2685 08D – 1:25000*. Department of Survey (DoS), GoN, Nepal.

EC. (2018). *Election history of Nepal.* Election Commission, Nepal. http://www.election.gov.np. Accessed: 10.11.2024.

EC. (2023). *Election History of Nepal.* Election Commission, Nepal. http://www.election.gov.np. Accessed: 10.11.2024.

GEOC. (2018). *Elections of members of HoR and provincial assembly 2018*. General Election Observation Committee, Nepal Law Society, Kathmandu, Nepal.

Giugal, A. (2013). Electoral geography: The concept and its evolution in Post-Communist Romani. *Annals of the Ovidius, 2,* 123−133. University of Constanta.

Karki, J. (2024). *Spatial and Temporal Voting Pattern of Nepal after Building New Constitution (2017 and 2022)*. (Unpublished Master's thesis). Tribhuvan University, Central Department of Education, Kirtipur, Nepal.

Kavianirad, M., & Rasouli, M. (2015*).* Explanation of the relationship between geography and elections (Electoral Geography). *Geopolitics Quarterly*. *10*(4), 93-108. %U https://journal.iag.ir/article_55904_cbe33daf5dca858cf1df7993e87d0e15.pdf. Accessed: 05.11.2024.

Kerekes, D. (2020). *The city as an onion? Case studies of electoral geography in Prague and Warsaw*. Department of Political Science, Masaryk University, *Sociológia - Slovak Sociological Review, 52*(3), 245–272. https://doi.org/10.31577/sociologia.2020.52.3.11

Koirala, H. L. (2008). Voting behaviour of Nepali people in Constitution Assembly Election 2008: Is there any spatial linkage? *Contributions to Nepalese Studies*, *35*(2),183-199, CNAS

Lee, H., & Repkine, A. (2022). A spatial analysis of the voting patterns in the South Korean general elections of 2016. *Social Sciences, 11*(9), 389. https://doi.org/10.3390/socsci11090389

LLRC. (2016). *Report of local level reconstruction commission (LLRC) 2016*. Local Level Reconstruction Commission (LLRC), Singhadurbar, Kathmandu, Nepal.

MoLMCPA (2020) *Political map of Nepal*. Ministry of Land Management, Cooperatives and Poverty Alleviation, Government of Nepal, Kathmandu.

Naturalium, R. (2007). *Elections in a spatial context a case study of Albanian Parliamentary Elections, 1991-2005*. (Unpublished Doctoral dissertation), University Potsdam, Tirana, Albania.

NR. (2016). Report of the commission on the number and demarcation of rural municipalities and special, protected or autonomous areas 2016 (Part 1-16). *Nepal Rajpatra-2073 (BS),* 1. Ministry of communication and Technology, Department of Printing. (n.d.). GoN, Nepal. http://rajpatra.dop.gov.np/welcome/list_by_type/1/2073. Accessed: 05.11.2024.

Pound, R., & Clements, F. E. (1898). *A method of determining the abundance of secondary species*. Minnesota Botanical Studies, pp. 2-19.

Rijal, S. P. (1999). Combination and competition of political parties in recent House of Representative elections in Nepal. *The Himalayan Review, 30*, 32–42. Nepal Geographical Society, Nepal.

Saleem, I., Mughloo, J., Mughal, A., & Baba, A. A. (2019). Quadrant standardization for herbaceous species of Benhama, Ganderbal area in Kashmir. *International Journal of Current Microbiology and Applied Sciences, 8*(03), 1697–1705. https://doi.org/10.20546/ijcmas.2019.803.197

Shrestha, A. K. (2020). Position of Nepali Congress in the Electoral Politics of Nepal. *Researcher: A Research Journal of Culture and Society, 4*(2), 32–42. https://doi.org/10.3126/researcher.v4i2.34623

Shrestha, A. K., Phuyel, S. P., & Poudel, K. K. (2020). Vote shifting patterns: Comparative cases from the constituent assembly elections in Nepal. *Journal of Social and Political Sciences, 3*(1), 1–12. https://doi.org/10.31014/aior.1991.03.01.141

Turhan, N. S. (2020). Karl Pearsons chi-square tests. *Educational Research and Reviews, 15*(9), 575–580. https://doi.org/10.5897/err2019.3817

Tamas, B. (2019), American disproportionality: A historical analysis of partisan bias in elections to the U.S. House of Representatives. *Election Law Journal 18*(1), 47–62.

TCC. (2008). *Observing the 2008 Nepal Constituent Assembly Election*. The Carter Center (TCC).

Visser, M. (1996). Voting: A behavioral analysis. *Behavior and Social Issues, 6*(1), 23–34. pahttps://doi.org/10.5210/bsi.v6i1.278