



Spatio-temporal Analysis of Voting Behaviors of Parliamentary Election in Haryana

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Abstracts

This study presents a comprehensive spatio-temporal analysis of voting behaviors in the parliamentary election held in Haryana. Drawing upon election results data at the constituency level, demographic information, and geographical data, we examine the spatial and temporal dynamics of voter preferences across Haryana's constituencies. Our analysis incorporates exploratory data analysis techniques to uncover patterns and trends in voting behavior, utilizing spatial analysis to discern spatial dependencies and temporal shifts. The findings of this study shed light on the nuanced interplay between spatial context, temporal dynamics, and socio-economic factors in shaping voting behaviors in Haryana's parliamentary election. In this research paper, voting trends and patterns in the parliamentary elections of Haryana have been studied. The nature of the study is spatial with the unit of analysis being the parliamentary constituency. The study covered all 10 parliamentary constituencies of Haryana, though the pattern of elections in 2009, 2014 and 2019 has been studied. Secondary data have been used for the study and voting patterns, gender gaps in voting and socio-economic determinants of voting are the main parts of the research. A clear spatial pattern of voting emerges in Haryana which is depicted with the help of maps. Tables and maps may also be used to understand the gender gap's temporal and spatial fluctuation. The seven primary elected factors of voting show a strong link with urbanization, which is the primary determinant of other proletariat, total proletariat, cultivators, and scheduled castes.

Keywords: Trends, Patterns, Gender gaps, Parliamentary Election



Introduction

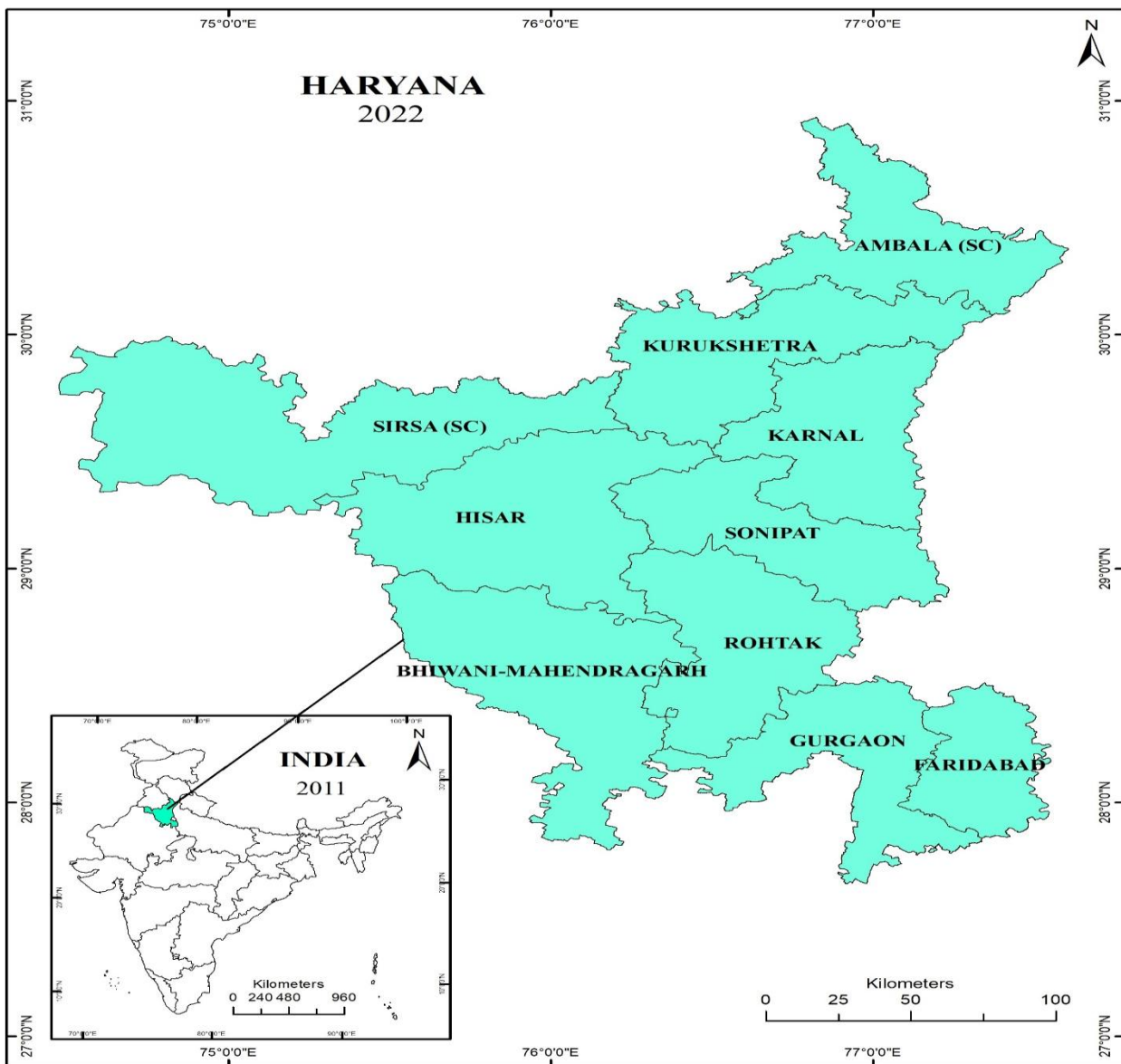
Voting has been studied by political scientists, besides political geography has a long tradition in it. Over a period of time, these studies came to be counted under electoral geography. The emergence of electoral geography as a subdiscipline of political geography coincided with the rise of the quantitative revolution in the social sciences as electoral data provides an opportunity for the study of large quantities of detailed geographical units (Dixit, 1995).

In the early period, the main objective was to display election data on the map. So initially it came to be known as the geography of voting. Since the quantitative revolution, however, such studies have been based on analysis of factors influencing voting, they *have come to be called* geographical influence studies in voting(Dixit, 2001). At present, electoral geography as a sub-branch of political geography is successfully studying various aspects of elections. The parliamentary elections are also called general elections or national elections in India because these elections are nationwide elections held in different phases. The different states of the Indian Union have their own political background. On this basis, various political parties prepare their election campaign strategy based on the phase of these elections and the politics of the province. Various regional parties in the provinces also influence it. Now various regional parties have started taking more interest in the politics of the center. Thereby, the party system is changing in the parliamentary elections (Pai, 1998).

Studying survey data from the National Election Study (NES), Deshpande found evidence of increased female voter participation in elections in India since the 1990s. Since then, the gender gap can also be seen declining. At the same time, understanding and sensitivity of women's issues has also increased in Indian society. Although the participation of women voters has not yet distinguished Indian politics and political parties on the basis of gender and there are also provincial variations, it is a positive sign in this direction (Deshpande 2004 and 2009) ^{4,5}. The participation of women voters is still less than men. Possible reasons for this could be women's sociality, marriage, maternity, employment, property rights and fewer resources. There are also social, economic, demographic and gender factors (Bhadane, 2015).

Study Area

Haryana came into existence in 1966 as a province. Haryana was the 17th province of India. Initially, there were 09 parliamentary and 81 Assembly constituencies in Haryana. At present, Haryana has 10 parliamentary constituencies and 90 assembly constituencies.



Source: Prepared by Author

Map 1: Location of the Study Area



In the context of parliamentary elections, the geographical location of Haryana is in Hindi heartland. Political speakers also give a special importance to Haryana province being a neighboring state of Delhi. However, Haryana is counted among the small states in terms of numbers in the Lok Sabha. But the political importance of Haryana can be understood in the light of the fact that despite having 10 parliamentary seats, this state has been Deputy Prime Minister and Cabinet Minister in the Central Government. The parliamentary constituencies in Haryana each possess distinct profiles shaped by their geographical, socio-economic, and political attributes. Ambala, situated in the northern region, encompasses a blend of urban centers and rural expanses, with the Ambala Cantonment symbolizing its strategic importance. Kurukshetra, centrally located, boasts historical significance alongside agricultural and industrial prowess, particularly in Karnal. Sirsa, in the southwest, predominantly relies on agriculture, complemented by its religious institutions. Hissar, in the central-west, balances urban and rural dynamics, with educational institutions enhancing its profile. Karnal, in the central-north, serves as a thriving agricultural and industrial hub. Sonapat, witnessing rapid urbanization, fosters growth in sectors like manufacturing and education. Rohtak, centrally positioned, flourishes as an educational and industrial center with a focus on infrastructure. Bhiwani-Mahendragarh, southwest, remains primarily agrarian while embracing growing industrialization. Gurgaon, in the south, stands out as a commercial powerhouse, driven by its IT and corporate sectors. Faridabad, southeast, thrives as an industrial city, fostering development in manufacturing and infrastructure. These constituencies represent diverse facets of Haryana's landscape, each contributing uniquely to the state's socio-economic fabric and electoral dynamics.

Objectives

- i. To study the spatial pattern of voting in parliamentary elections 2009, 2014 and 2019 in Haryana.
- ii. To examine the spatial analysis of the gender gap in voting pattern in parliamentary elections 2009, 2014 and 2019 in Haryana.

Database & Methodology

The present research uses secondary data whose main sources are Election Commission of India, Election Commission of India's Election-wise Statistical Report, Census of India, Primary Census Report of Census, various published researches. The analysis unit of the study has been selected as parliamentary constituency, which covers all the 10 parliamentary constituencies of Haryana state.



Various enumerated tables, diagrams and maps have been used for analysis. A comparative study have been done through maps of different elections to understand the spatio-temporal change of variables. The proposed research has been based on local structural approach and local ecological approach. Arc GIS software has been used to generate the necessary maps. This helps in understanding the geographical distribution of different dimensions of voting and its importance in a pattern.

Result & Discussion

Spatio-temporal of Voting Trend 2009-2019

Voting is an important factor demonstrating participation in elections. The total voting percentage is the real indicator of any democratic election because it really tells how many citizens the elected representatives are representing from the said election. Since Haryana came into existence till the 2019 parliamentary elections, we will try to understand the voting trend with the following diagram: It is clear from the voting of the above 14 parliamentary elections that male turnout has been higher than female voting in Haryana. The highest voter turnout in the above-mentioned years was 73.26 in the 1977 elections and the highest turnout of 75.81 per cent and 70.39 per cent for women and men respectively in the same election. The minimum turnout for women was 63.68 per cent in the 1999 elections, while the minimum turnout for women was 58.27 per cent in the same election while the lowest turnout among men was 67.78 per cent in the 1971 parliamentary elections. The average gender gap during this period was 6.07 per cent and the lowest gender gap was recorded in the 2019 election.

The table 1 shows voter turnout percentages for various parliamentary constituencies in Haryana for the years 2009, 2014, and 2019, alongside the differences in turnout between consecutive years. In 2009, Ambala had a turnout of 68.51%, which increased to 72.09% in 2014 but decreased slightly to 71.10% in 2019. Similarly, Kurukshetra saw an increase in turnout from 75.04% in 2009 to 75.82% in 2014, followed by a decline to 74.29% in 2019. On the other hand, constituencies like Hisar and Gurgaon experienced significant fluctuations in turnout, with Hisar witnessing a substantial increase from 69.35% in 2009 to 76.23% in 2014, followed by a decrease to 72.43% in 2019, while Gurgaon saw a notable increase from 60.80% in 2009 to 71.58% in 2014 but a subsequent decrease to 67.33% in 2019. Overall, the table highlights varying voter engagement levels across different constituencies over the specified time period (Table 1).



Table 1: Trends of Voting Pattern of Parliamentary Election in Haryana, 2009-2019

Sr. No.	Parliamentary Constituency	2009	2014	2019	Differences (2009-14)	Differences (2014-19)
1	Ambala	68.51	72.09	71.10	3.58	-1.00
2	Kurukshetra	75.04	75.82	74.29	0.78	-1.54
3	Sirsa	74.93	77.04	75.99	2.11	-1.05
4	Hisar	69.35	76.23	72.43	6.88	-3.80
5	Karnal	66.64	70.87	68.35	4.23	-2.52
6	Sonipat	64.75	69.61	71.02	4.86	1.41
7	Rohtak	65.56	66.71	70.52	1.15	3.81
8	Bhiwani-Mahendragarh	71.34	69.97	70.48	-1.37	0.50
9	Gurgaon	60.80	71.58	67.33	10.78	-4.25
10	Faridabad	56.66	64.98	64.10	8.32	-0.88
Haryana		67.36	71.49	70.56	4.13	-0.93

Source: Election Commission of Haryana, 2009-2019

Spatio-temporal of Male Voting Trend 2009-2019

The table 2 delineates the trends in male voter participation in parliamentary elections across different constituencies in Haryana spanning from 2009 to 2019. It showcases the percentage of male voters who exercised their franchise in each constituency for the specified years, along with the variations in turnout between successive elections. For instance, in Ambala, the male voter turnout stood at 70.09% in 2009, rose to 73.78% in 2014, and then decreased to 71.43% in 2019. This represents an increase of 3.69% from 2009 to 2014, followed by a decrease of 2.36% from 2014 to 2019. Similarly, other constituencies exhibit fluctuations in male voter turnout over the years, highlighting shifts in political engagement and participation among male electorates across Haryana. Voting allows men to hold elected officials accountable for their actions and decisions. Through regular elections, male voters have the opportunity to evaluate the performance of incumbents and decide whether to re-elect them or support alternative candidates. Male voters view elections as a chance to drive societal change and reform by voting for candidates advocating for specific policy initiatives. Voting holds historical significance for men, particularly those who have fought for the right to vote. Men have historically participated in social and political movements, and



voting upholds their rights and freedoms. Voting strengthens social cohesion and contributes to the overall well-being of society by engaging in collective decision-making.

Table 2:Trends of Male Voting Pattern of Parliamentary Election in Haryana, 2009-2019

Sr. No.	Parliamentary Constituency	2009	2014	2019	Differences (2009-14)	Differences (2014-19)
1	Ambala	70.09	73.78	71.43	3.69	-2.36
2	Kurukshetra	75.88	76.92	74.16	1.04	-2.76
3	Sirsa	75.66	78.29	76.21	2.64	-2.09
4	Hisar	70.55	77.68	72.33	7.13	-5.34
5	Karnal	68.97	73.30	69.33	4.33	-3.97
6	Sonipat	66.97	71.31	70.52	4.34	-0.79
7	Rohtak	68.61	69.47	69.66	0.85	0.19
8	Bhiwani-Mahendragarh	72.80	72.09	68.40	-0.71	-3.70
9	Gurgaon	63.93	74.58	67.69	10.65	-6.89
10	Faridabad	59.95	67.36	64.86	7.42	-2.50
Haryana		69.34	73.48	70.46	4.14	-3.02

Source: Election Commission of Haryana, 2009-2019

Spatio-temporal of Female Voting Trend 2009-2019

The table 3 illustrates the voting patterns of female voters in parliamentary elections across different constituencies in Haryana for the years 2009, 2014, and 2019, alongside the differences in turnout between successive elections. For instance, in Ambala, the female voter turnout stood at 67.58% in 2009, increased to 70.72% in 2014, and slightly decreased to 70.20% in 2019. This reflects an initial rise of 3.14% from 2009 to 2014, followed by a marginal decline of 0.52% from 2014 to 2019.



Table 3: Trends of Female Voting Pattern of Parliamentary Election in Haryana, 2009-2019

Sr. No.	Parliamentary Constituency	2009	2014	2019	Differences (2009-14)	Differences (2014-19)
1	Ambala	67.58	70.72	70.20	3.14	-0.52
2	Kurukshetra	74.59	75.04	73.96	0.45	-1.09
3	Sirsa	74.27	75.75	75.39	1.47	-0.36
4	Hisar	68.70	75.14	71.63	6.44	-3.51
5	Karnal	64.29	68.42	66.83	4.13	-1.58
6	Sonipat	62.91	68.22	70.61	5.31	2.40
7	Rohtak	64.23	65.65	69.61	1.42	3.96
8	Bhiwani-Mahendragarh	72.23	69.81	70.44	-2.41	0.63
9	Gurgaon	58.46	69.31	66.26	10.84	-3.04
10	Faridabad	52.83	62.30	62.78	9.47	0.48
Haryana		66.01	70.04	69.77	4.03	-0.26

Source: Election Commission of Haryana, 2009-2019

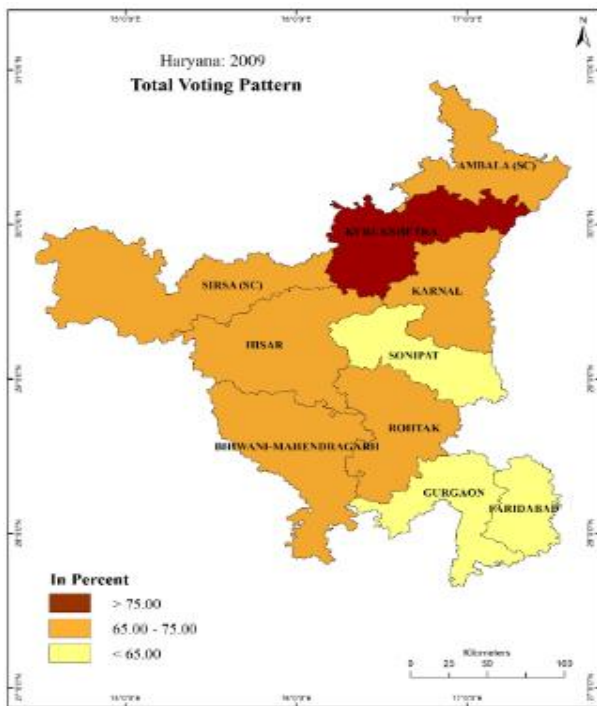
Similar fluctuations in female voter turnout are observed across other constituencies, indicating varying degrees of engagement and participation over the specified time period. Overall, while some constituencies experienced steady increases in female voter turnout over the years, others witnessed slight fluctuations, highlighting the dynamic nature of female voting behavior in Haryana.

Parliamentary constituency-wise polling pattern

In Haryana, there are 10 parliamentary seats. Ambala and Sirsa are the two restricted zones, and there are eight general areas. When it comes to election-wise voting, Kurukshetra parliamentary constituency achieved the highest turnout in the 2009 parliamentary elections, while Faridabad parliamentary constituency recorded the lowest turnout. Similarly, in the parliamentary constituencies of Sirsa and Faridabad, the highest and lowest vote percentages were registered in the elections of 2014 and 2019, respectively. To display the vote trend, the maps have been separated into three voting groups. The first group, with 67 percent or less votes, is classified as having low voter participation. The second falls into the moderate voting group, with turnout exceeding 67% and reaching up to 72%. Over 72% of respondents turned up for the third.

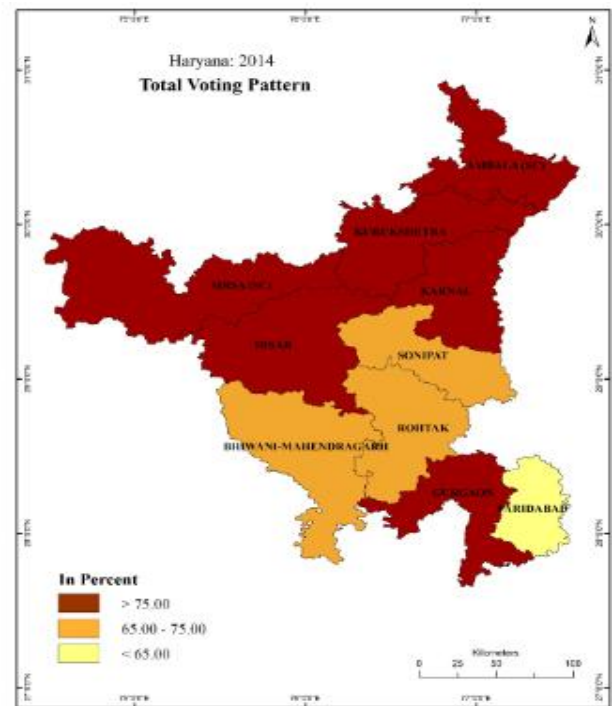
The maps make it evident that the parliamentary seats of Bhiwani-Mahendragarh, Sirsa, and Kurukshetra continued to get a high percentage of votes in the 2009 elections. The parliamentary seats of Karnal, Sonapat, Rohtak, Gurgaon, and Faridabad were in the low voting group, while Ambala and Hisar were in the medium voting category. In the 2014 parliamentary elections, Ambala, Kurukshetra, Sirsa, Hisar, and Gurgaon were the constituencies with the highest voter turnout. Faridabad stayed in the lower category while Karnal, Sonipat, Rohtak, and Bhiwani-Mahendragarh in the medium category. In the same way, the highest category polling constituencies in 2019 were Kurukshetra, Sirsa, and Hisar. The middle-class parliamentary constituencies were Ambala, Karnal, Sonapat, Rohtak, Bhiwani-Mahendragarh, and Gurgaon; Faridabad had the lowest voter participation for the third straight election.

Therefore, a distinct voting pattern appears when the average turnout for the three elections is mapped according to parliamentary constituencies. Kurukshetra, Sirsa, and Hisar are in the high voting category, Ambala, Karnal, Sonapat, Rohtak, and Bhiwani-Mahendragarh are in the medium category, while Gurgaon and Faridabad are in the lower voting category, as per the results of the parliamentary elections.



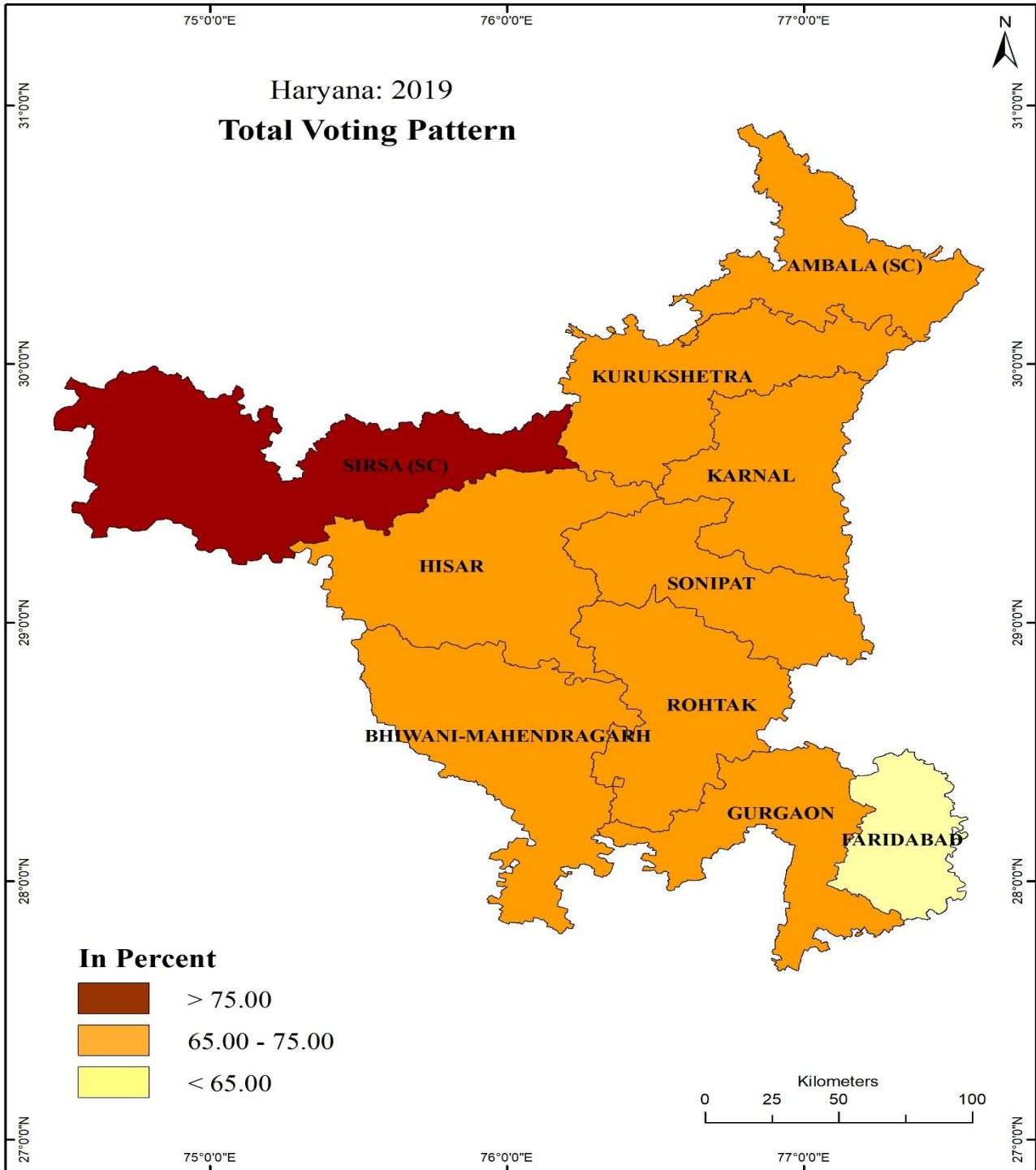
Source: Based on table 1

Map 1



Source: Based on table 1

Map 2



Source: Based on table 1

Map 3



From a geographic perspective, West-North Haryana is obviously a high voting area. The moderate polling areas in Haryana are North, North-East, and South; the low polling region is South-East Haryana. These mock ballot boxes show the geographic distribution of political engagement in the aforementioned locations in addition to the average voting behaviour of the three elections.

Although it is not the topic of this research article, this voting pattern may also be used to analyse the geographic distribution of various political parties. This suggests potential areas for further investigation. Thus, for all three of the aforementioned elections, the correlation of the seven determinants was in the same direction. That is, the correlation between urbanisation, literacy, and other working people, as well as the sex ratio, total worker, farmers, and scheduled castes, was negative for all three elections. But there was undoubtedly variation in each person's worth and status. After the aforementioned research, the seven factors can be referred to as the primary socio-economic determinants of voting. Some empirical researches have also discovered that caste, religion, creed, language, money, election campaign, ideology, and policies are additional variables (Zahida & Shaikh, 2014).

Conclusion

The research examines voting patterns, and gender gap in Haryana. The voting percentage has consistently been above 60 since 1967, with the highest turnout in 1977 and the lowest in 1999. Male turnout has been high, but the gender gap is narrowing. The minimum voting gap was 0.72 per cent in the 2019 parliamentary elections. The lowest voter turnout was recorded in Faridabad parliamentary constituency in all the three elections. Haryana's western and northern Parliamentary constituencies, Sirsa, Hisar, and Kurukshetra, form high voting boxes, while Faridabad and Gurgaon are lowest. Ambala, Karnal, Sonapat, Rohtak, and Bhiwani-Mahendragarh form medium ballot belts. As a result, the vote pattern appears on the map as three distinct boxes. According to the current study, the gender gap is the discrepancy between the voter to electorate sex ratio (female number per thousand males). When it was plotted using a bar diagram on the map of Haryana, it was discovered that the seats for the Parliamentary with the highest vote percentages had smaller gender gaps.

The gender disparity has increased in accordance with the same pattern in cases when the voting percentage has been low. As an illustration, the Parliamentary seat with the largest gender disparity



and the lowest vote percentage was Faridabad. Nevertheless, statistical analysis is also required to make this trend clearer.

Of the three Parliamentary elections, the biggest gender difference was observed in 2014. The smallest gap was observed in 2019. All seven of the variables chosen to represent the socioeconomic factors of voting showed a correlation with voting. They discovered unfavorable relationships with literacy, urbanization, and other working individuals. Furthermore, a positive link was discovered with the scheduled caste, total working class, sex ratio, and cultivator. Additionally, there is a strong positive link with all working people, cultivators, and scheduled castes, and a strong negative correlation with urbanization and other working people.

Refences

1. Bhadane, K. R. (2015). Gender Gap and Women Participation in the Democratic Process of Assembly Elections and Socio-Demographic Factors: Affecting on Women's Voting Patterns in India. *Human Rights International Research Journal*, Vol. 3, issue 1.
2. Deshpande, R.A . (2004). How gendered was women participation in elections 2004? *Economic and Political Weekly*, 39(59), 5431-5436.
3. Deshpande, R.A. (2009). How Did Women Vote in parliamentary Elections 2009? *Economic and Political Weekly*, 44 (39), 83-89.
4. Dixit, R. D. (1995) *Geography of Alexions the Indian Context* . Rawat Publications, Jaipur and New Delhi.
5. Dixit, R. D. (2019). *Political Geography: Contemporary Perspectives* . Learning Private Limited, Sixth Edition, p. 10
6. Election Commission of India Statistics Report, Parliamentary Elections 2009.
7. Election Commission of India Statistics Report, parliamentaryElections 2014.
8. Election Commission of India Statistics Report, parliamentaryElections 2019.
9. Pai, S.(1998). The Indian Party System under Transformation. *Parliamentary Elections Asian Survey*, 38(9), 836-852.
10. Zahida, A .&Shaikh, U. (2014). Determinants of Voting Behaviour in India: Theoretical Perspectives.*Public Policy and Administration Research*, 4(8), 236-253.