

A SPATIO-TEMPORAL ANALYSIS OF VOTER TURNOUT IN THE ASSEMBLY ELECTIONS IN WEST BENGAL (2006-2016): A STUDY IN ELECTORAL GEOGRAPHY

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ABSTRACT

India is the largest democracy in the world. Democracy is a social philosophy and the most geographic form of government wherein people have the power to make decision about issues of politics and also they chose their representative. The paper attempts to study a spatio-temporal analysis of voter turnout in the West Bengal assembly elections from 2006 to 2016. Electoral geography is relatively a very later emerging field of research in geography and remained as the sub-field of political geography. It is the study of geographical aspects of organization, management and the result of elections. Voting turnout means the percentage of eligible voters who cast a ballot in an election. Voting turnout is measured as the percentage of registered voters in a constituency (a geographical area) who actually exercise their voting right at time of election. So, it is clear that identification of the spatial pattern and trends of voter turnout can be used as an effective tool to assess the level of political awareness in a region. The study analyze spatial and changing pattern of voter turnout and find out the impact of socio-economic variables on voter turnout. The present study is conducted in West Bengal assembly election (2006-2016). West Bengal is one of the most densely populated states of India and located in the eastern part of the country. The entire study is based on secondary source of data. The electoral data have been collected from Election commission of India, New Delhi, Chief Electoral officer, Kolkata, CSDS (Centre for the study of Developing Societies). All the analysis is done through various statistical techniques like mean, standard deviation, coefficient of variation, correlation. Choropleth maps are used to depict the spatial distribution of different levels of voting and spatial variation of voting turnout is depicted in the form of Z-scores of percent votes polled. It finds out that 2011 assembly election has been recorded highest voter turnout, the south western part of the state has concentrated high change of voter turnout and low change of voter turnout has been found in southern and south-east part of the state. It shows increase trend of voter turnout among female electorate from 2006 to 2016 assembly elections. Several socio-economic

variables i.e. agricultural labourers, agricultural workers, electorate density, sex ratio, rural population and SC population are strong positively associated with voter turnout during all study elections.

Keywords: Assembly election, Electoral geography, Political geography, Voter turnout.

INTRODUCTION

Electoral geography is relatively a very new emerging interested field of research in geography. Electoral geography is one of the important branches of political geography. The subject is essentially concerned with the spatial and environmental perspective of political decision making processes. In other words, electoral geography is the study of geographical aspects of organization, management and the result of elections. Golledge et al. (1972) has pointed out that electoral geography is one of the main sources of fresh insights into the general field of human spatial behaviour. The school of electoral geography was first developed by the pioneer work of Andre Siegfried in 1913 and known as the 'father of electoral geography'. The main role of electoral studies in political geography is to investigate the spatial variations in the distribution of votes cast which goes in favour or against the party or candidate. Now-a-days, it is being realized that geography is profoundly affected by governments (Busteed 1975, p.54). Voter turnout means the percentage of eligible voters who cast their votes during an election. Voter turnout is generally measure as the percentage of registered voters in each constituency who actually exert their voting right during the time of election. The study of voter turnout is important because it can potentially set insight into the extent of citizen support for a political system (Dikshit, 1988). Palmer (1976)) has explained that Voting is the most common and the most widely discussed form of political participation related to the electoral process. Electoral participation has been found in greater modern societies as comparison to the traditional society. Lipset (1960, p.184) has also summarized that the situation in which the results is high participation by members of a group which normally has a higher potential for democracy i.e. for the maintenance of an effective opposition than one where few people show interests or participate in the political process. In other hand, a society in which a large proportion of the population is outside the political arena is potentially more explosive than one in which most citizens are regularly involved in activates that give some sense of electoral participation in decision making process which may affect their lives. The assembly elections in India are one of the election in which the Indian electorate select the members for state legislative assembly (Vidhan Sabha). The number of constituencies in West Bengal assembly election is 294 in which 68 seats are reserved for Scheduled Caste (SC) and 16 seats reserved for Scheduled Tribes (ST) population. The first assembly election in West Bengal was started in 1952, at that time voter turnout was 42.23 percent. The present research work analyzes the spatio-temporal pattern and trends of voter

turnout, changing pattern of voter turnout, spatial pattern and variation of male and female voter turnout in assembly elections of West Bengal from 2006 to 2016. The study examined and find out the effects of socio-economic variables on voter turnout.

AIMS AND OBJECTIVES

The present research paper is based on following principle objectives

- I. To analyze the spatial pattern and trends of voter turnout during 2006, 2011 and 2016 assembly elections in West Bengal.
- II. To analyze the changing pattern of voter turnout from 2006 to 2016 assembly elections.
- III. To study the spatial pattern of male and female voter turnout in 2006, 2011 and 2016 assembly elections in West Bengal.
- IV. To examine the effects of socio-economic variables on voter turnout.

DATABASE AND METHODOLOGY

The present research analysis is based on the secondary source of data. The electoral data have been collected from Election Commission of India, New Delhi, CSDS (Centre for the Study of Developing Societies), Census of India, Chief Electoral officer, West Bengal, district statistical handbook and various published research journals, articles, magazine. The relationship between socio-economic variables and voter turnout has been examined with the help of Karl Pearson's technique of product moment correlation coefficient through SPSS (Version20). This relationship has been clearly presented with scattered diagram. Arc-GIS (Version10) based digitize choropleth maps prepared for the spatial distribution of different levels of voter turnout and spatial variation in voter turnout depicted in the form of Z-scores.

Z-scores Formula:
$$\text{Smith's } Z = \frac{X - \bar{X}}{SD}$$

Where, Z= Standardized value of variables, X= Actual value of each variables, \bar{X} = Mean value of variables, SD= standard deviation of variables

Karl Pearson Correlation Coefficient:
$$\text{Pearson's } r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where, r = correlation, n = total number of variables/ observation, x = independent variables, y = dependent variables,

Study Area:

West Bengal is an Indian state which is located in the eastern part of the country. Since independence, West Bengal has been become one of the important state in terms of India's political scenario. The geographical profile of West Bengal is known as diversified as its culture. The northern part of the state is bounded by the country Nepal, Bhutan and Indian state Sikkim. The Assam state bounded it in north-east portion of the state. The eastern part of the state has surrounded by the country Bangladesh and southern portion by Bay of Bengal. The two Indian state Jharkhand and Bihar bounded it in west and south-west by Orissa. West Bengal is located between 85° 50' and 89° 50' East longitude, and 21° 10' and 27° 38' North latitude. The state has a total area of 88,750 Sq.kms. (34,267 sq mile). The state is divided into three administrative divisions and it has 20 districts. According to 2011 population census, the total population of West Bengal is 90.32 million. It has population density of 1028 persons per sq km. The literacy rate is 74.08% which is higher than national average literacy rate. According to 2011 population census, the sex ratio in West Bengal is 950 females per 1000 of males. West Bengal is a home of different religious people i.e. Hindu (70.54%), Muslim (27.01%), Christian (0.72%), Sikh (0.07%), Buddhist (0.31%), Jain (0.07%). West Bengal has 31.87 percent urban population and rural population is 68.13 percent according to 2011 population census. Agriculture is the main occupation of the people in West Bengal. Approximately 75 percent of the total working population of West Bengal is still possessed by agricultural activities.

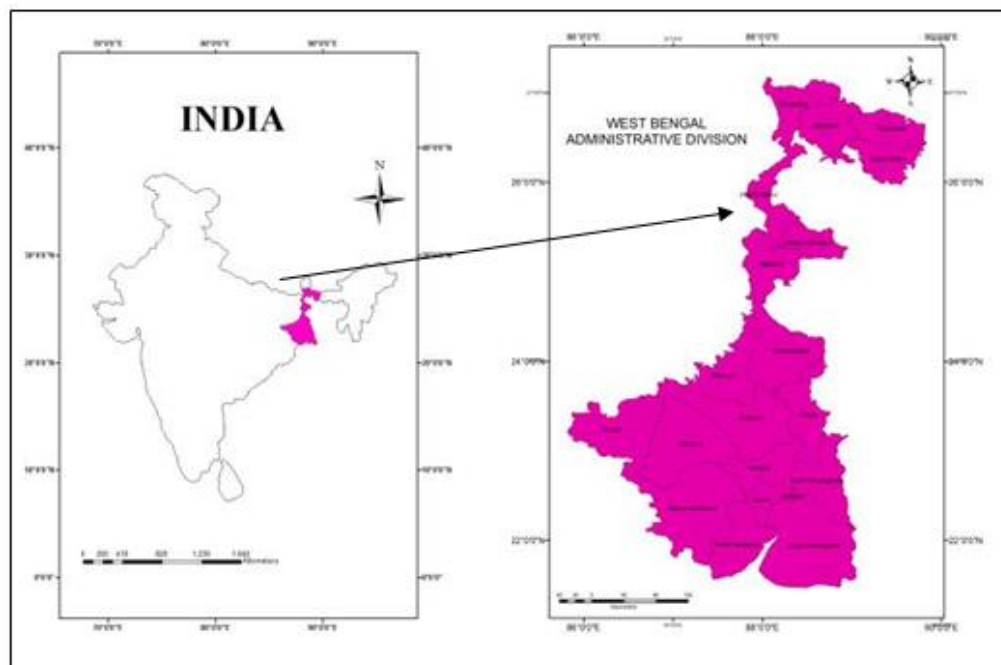


Fig 01: Study Area: West Bengal Administration Division

RESULTS AND DISCUSSION

Spatial Pattern and Trends of Voter Turnout:

Voting is the most common and the most widely discussed form of political participation related to the electoral process during an election. The spatial pattern of voter turnout in West Bengal has clearly evidenced that these have been major channel of political participation. It has involved a large number of people in voter turnout than in any other single national endeavor which bringing political leaders in to a direct contact the masses. Thus, the spatial patterns of voter turnout in West Bengal assembly election from 2006 to 2016 has discussed below.

Table 1: Spatial pattern and trends of voter turnout in West Bengal assembly elections (2006-2016)

Election Years	Voter Turnout (%)
2006	81.97
2011	84.33
2016	82.66

Source: Based on Statistical Report in 2006, 2011 and 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The above table 1 shows the percentage of voter turnout in the assembly elections of West Bengal from 2006 to 2016. It reveals that the voter turnout of 2011 assembly election is highest i.e. 84.33 percent whereas 2006 assembly election recorded as the lowest voter turnout i.e. 81.97 percent. The voter turnout from 2006 to 2011 assembly election has shown an increasing tendency but the voter turnout has declined to 82.66 percent in the 2016 assembly election (figure: 02).

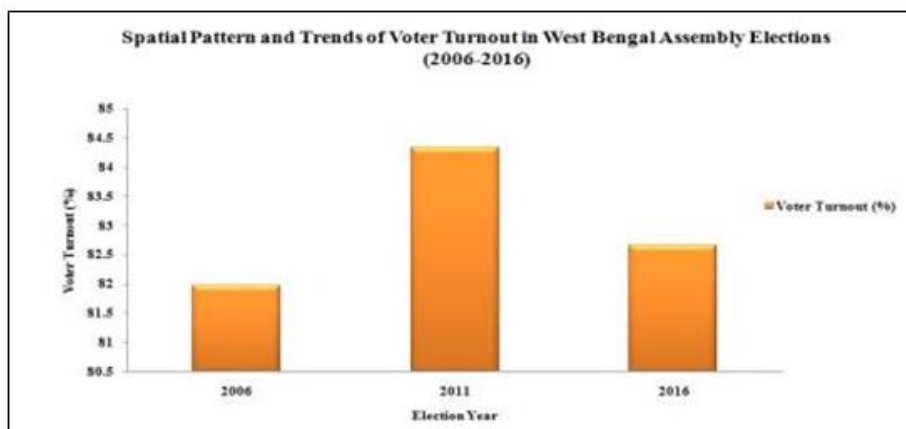


Fig 02: Spatial Pattern and Trends of Voter turnout in West Bengal Assembly Elections (2006-2016)

Table 2: Constituency wise spatial pattern of voter turnout in 2006 assembly election

Categories	Voter Turnout (%)	Frequency Distribution of Constituencies
Very Low	50.51-66.88	14
Low	67.61-76.49	41
Medium	76.84-82.22	75
High	82.37-86.82	81
Very High	86.92-94.19	83
Total		294

Source: Computed by the researcher Based on Statistical Report in 2006 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 2 clearly shows constituency wise spatial pattern and frequency distribution of constituencies of voter turnout in 2006 assembly election in West Bengal. It reveals that 14 constituencies are come under very low voter turnout category. It includes Jorasanko, Chowrangee, Bhabanipore, Rashbehari Kharagpur, Entally, Darjeeling, Howrah Uttar, Sreerampur etc constituencies. Out of these 14 constituencies, the very low voter turnout has been recorded in Jorasanko constituency i.e. 50.51 percent voter turnout. There are 41 constituencies are fall in the low voter turnout categories. They are Kashipur-Belgachia, Kalimpong, Asansol Uttar Bhatpara, Bidhan Nagar, Barangar etc constituencies. Among 41 constituencies, the low voter turnout has found in Kashipur-Belgachia constituency i.e. 67.61 percent voter turnout. The table 1.2 shows that 75 constituencies are under moderate voter turnout categories i.e. Sankrail (SC), Kashipur, Kamarhati, Para (SC), Joypur, Durgapur Purba, Uluberia Purba, Bankura, Behala Purba, Siliguri, Magrahat Purba (SC), Jhargram, Noapara etc. There are 81 constituencies are fall in the high voter turnout division. Out of 81 constituencies, the highest voter turnout has been recorded in Dum Dum Uttar constituency i.e. 86.82 percent voter turnout. It also shows that 83 constituencies are come under very high voter turnout categories. Among 83 constituencies, the very highest voter turnout has been found in Sabang constituency i.e. 94.19 percent. The high and very high voter turnout has been concentrated in the southern part of the state whereas low voter turnout concentrated in the western part of the state (Fig: 03).

Table 3: Constituency wise spatial pattern of voter turnout in 2011 assembly election

Categories	Voter Turnout (%)	Frequency Distribution of Constituencies
Very Low	54.43-70.97	12
Low	72.52-79.34	32
Medium	79.48-84.13	56
High	84.32-88.57	121
Very High	88.73-93.34	73
Total		294

Source: Calculation Based on Statistical Report in 2011 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 3 shows that 12 constituencies are come under very low voter turnout categories. Out 12 constituencies, the very low voter turnout has been obtained in Chowrangee constituency i.e. 54.43 percent voter turnout. There are 32 constituencies are recorded in low voter turnout categories, it includes Howrah Uttar, Metiabruz, Maniktala, Goalpokhar, Kulti, Bally, Sreerampur etc. Howrah Uttar constituency has been recorded as the lowest voter turnout i.e. 75.52 percent out of 32 constituencies. The table 3 depicts that 56 constituencies are come under medium voter turnout categories i.e. Barangar, Mothabari, Behala Purba, Bijpur, Manickchak, Bankura, Purulia, Barbani, Ratua etc. There are 121 constituencies in high voter turnout category. Among these, highest voter turnout is found in Canning Paschim (SC) constituency i.e. 88.57 percent voter turnout. The table 3 further shows that 73 constituencies are recorded in very high voter turnout category. Like 2006 assembly election, Sabang constituency has also been found very high voter turnout in 2011 assembly election i.e. 93.43 percent. The figure 04 shows that the southern part of the state has recorded high voter turnout and western part indicates moderate and low voter turnout.

Table 4: Constituency wise spatial pattern of voter turnout in 2016 assembly election

Categories	Voter Turnout (%)	Frequency Distribution of Constituencies
Very Low	53.73-68.30	12
Low	69.51-75.49	25
Medium	76.63-81.92	53
High	82.05-86.23	108
Very High	86.30-90.96	96
Total		294

Source: Based on Statistical Report in 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 4 represents that 12 constituencies are come under very low voter turnout category. The very low voter turnout has been found in Jorasanko constituency i.e.53.73 percent out of 12 constituencies. There are 25 constituencies are come in the low voter turnout division. It includes Bijpur, Maniktala, Bally, Entally, Kalimpong, Kandi, Champdani, Barangar, Raniganj etc. Among theses Bijpur constituency has recorded as low voter turnout i.e. 69.51 percent. The table 4 also disclosed that 53 constituencies are come under medium voter turnout division. There are 108 constituencies come fall in high voter turnout category. Out of 108, highest voter turnout is found in Alipurduars, Nabadwip constituency both has 86.23 percent voter turnout. It also shows that 96 constituencies are recorded in very high voter turnout division. The very high voter turnout has been obtained in Narayangarh constituency i.e. 90.96 percent. The figure 05 reveals that southern and middle portion of the state has recorded very high and high voter turnout and some portion of northern part has found low voter turnout.

Table 5: Constituency wise changing pattern of voter turnout in assembly elections in West Bengal (2006-2016)

Categories	Changing Voter Turnout (Z-Scores of % Change Voter Turnout)	Frequency Distribution of Constituencies
Low	-2.22 to -0.56	78
Medium	-0.57 to 0.65	149
High	0.66 to 6.51	67
Total		294

Mean () = 1% St. Deviation (σ) = 4.40%

Source: Calculation by the researcher on the basis of Statistical Report in 2006 to 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

(i) Low (Z-Score -2.22 to -0.56): There are 78 constituencies have been observed in low change of voter turnout. They are Kharagpur Sadar, Bagdah (SC), Kolkata Port, Ranaghat Uttar Purba (SC), Chakulia, Domkal, Bongaon Dakshin (SC), Khardaha, Jalangi, Chanchal, Ballygunge, Habra, Tamluk etc. Table 1.5 analyzed that Kharagpur Sadar (-8.77%), Bagdah (SC) (-8.41%) and Kolkata Port (-8.16%) etc constituencies has been recorded low change of voter turnout.

(ii) Medium (Z-Score -0.57 to 0.65): The moderate change of voter turnout has been recorded in 149 constituencies. It observed that Ballygunge (-1.5%), Goalpokhar (-1.45%), Kalchini ST(-1.37%), Jadavpur (-1.35%), Karimpur (-1.33%), Dhupguri (SC)(-1.22%), Bally(-1.2%), Budge Budge (+3.87%), Baghmundi (3.83%), Saptagram (3.76%) etc constituencies has found high moderate change of voter turnout.

(iii) High (Z-Score -0.10 to -0.20): It observed 67 constituencies are high change of voter turnout. Among them, Kharagpur (29.67%), Raidighi (19.09%), Asansol Dakshin(11.66%), Bhabanipore (11.64%), Matigara-Naxalbari-SC (11.53%), Tehatta (10.56%), Diamond Harbour

(9.82%), Raghunathpur-SC (8.93%), Magrahat Purba-SC (8.11%), Rashbehari (7.98%), Uluberia Uttar-SC (7.59%), etc constituencies are observed high change of voter turnout. The south-western constituencies of the state has recorded as high change of voter turnout and low change has been found in southern and south-east constituencies of the state (Fig: 06).

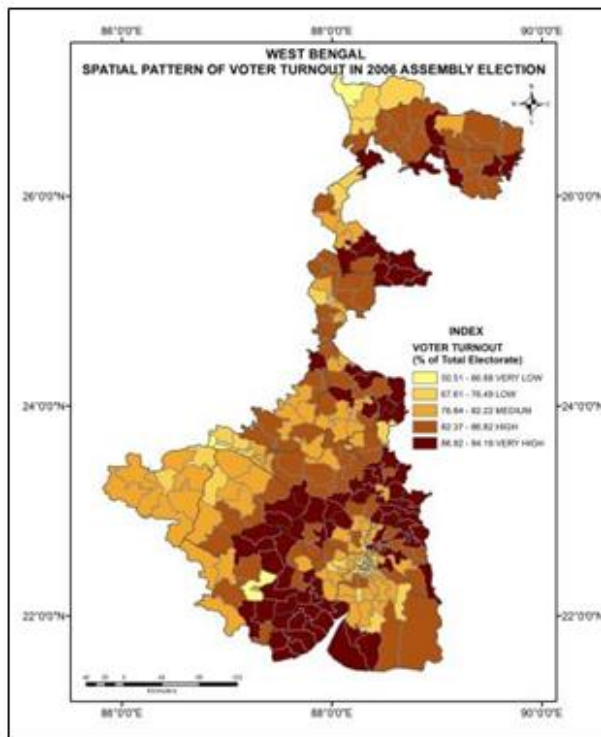


Fig: 03 Spatial pattern of voter turnout in 2006

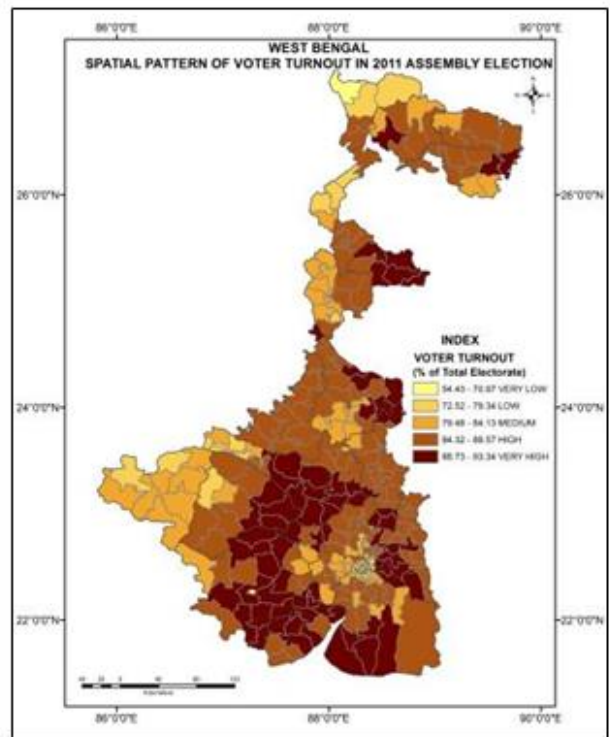


Fig: 04 Spatial pattern of voter turnout in 2011 assembly election

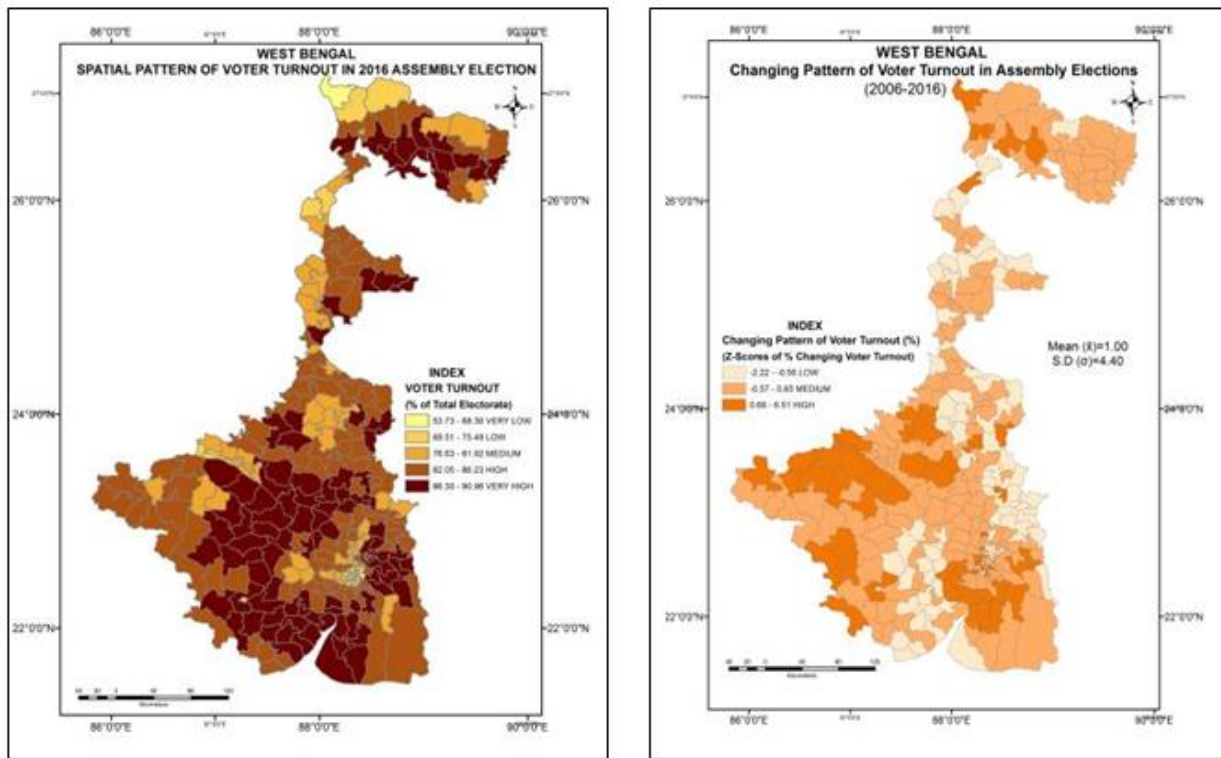


Fig: 05 Spatial pattern of voter turnout in 2016 assembly election Fig: 06 changing pattern of voter turnout in the assembly (2006-2016)

Table 6: District wise spatial patterns of voter turnout in the assembly elections in West Bengal (2006 to 2016)

S.N	Districts Name	Voter Turnout (%) 2006	Voter Turnout (%) 2011	Voter Turnout (%) 2016
1	Cooch Behar	82.30	86.08	78.12
2	Alipurduar	83.97	85.21	84.19
3	Jalpaiguri	85.90	86.12	86.55
4	Darjeeling	78.05	79.40	77.32
5	Uttar Dinajpur	83.45	82.30	81.74
6	Dakshin Dinajpur	90.95	89.10	86.72
7	Malda	83.86	82.73	81.77
8	Murshidabad	84.76	85.97	82.33
9	Nadia	88.01	87.88	85.58
10	North 24 Parganas	84.89	85.20	82.11
11	South 24 Parganas	85.96	84.29	83.35
12	Kolkata	63.29	65.64	64.65
13	Howrah	82.01	81.73	79.94
14	Hooghly	83.75	84.80	82.80
15	Purbo Medinipur	89.36	90.23	87.34

16	Paschim Medinipur	83.98	88.49	86.36
17	Purulia	79.69	81.06	82.98
18	Bankura	83.98	87.05	86.32
19	Bardhaman	85.40	86.17	83.40
20	Birbhum	83.96	86.84	85.18
	West Bengal	81.97	84.33	82.66

Source: Computed by the researcher based on Statistical Report in 2006, 2011 and 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 6 shows district wise spatial patterns of voter turnout in the assembly elections in West Bengal from 2006 to 2016. It clearly reveals that the turnout to the 2011 assembly election in West Bengal is the highest i.e. 84.33 percent, whereas at the 2006 assembly election, it is recorded as the lowest voter turnout i.e. 81.97 percent. So the voter turnout in assembly elections from 2006 to 2011 has shown an increasing tendency, whereas the voter turnout decreased to 82.66 percent in 2016 assembly election. It analyzed that in 2006 assembly election the highest voter turnout has been recorded in Dakshin Dinajpur district i.e. 90.95 percent whereas the lowest voter turnout is found in Kolkata district i.e. 63.29 percent. The table 6 shows that Purbo Medinipur district has recorded as the highest voter turnout i.e. 90.23 percent in 2011 assembly election in West Bengal but again Kolkata district has recorded as lowest voter turnout i.e. 65.64 percent. It also displays that Purbo Medinipur district again keep maintain their highest voter turnout i.e. 87.34 percent. One of the most important notable points is that Kolkata districts have been found very lowest voter turnout in three consecutive elections.

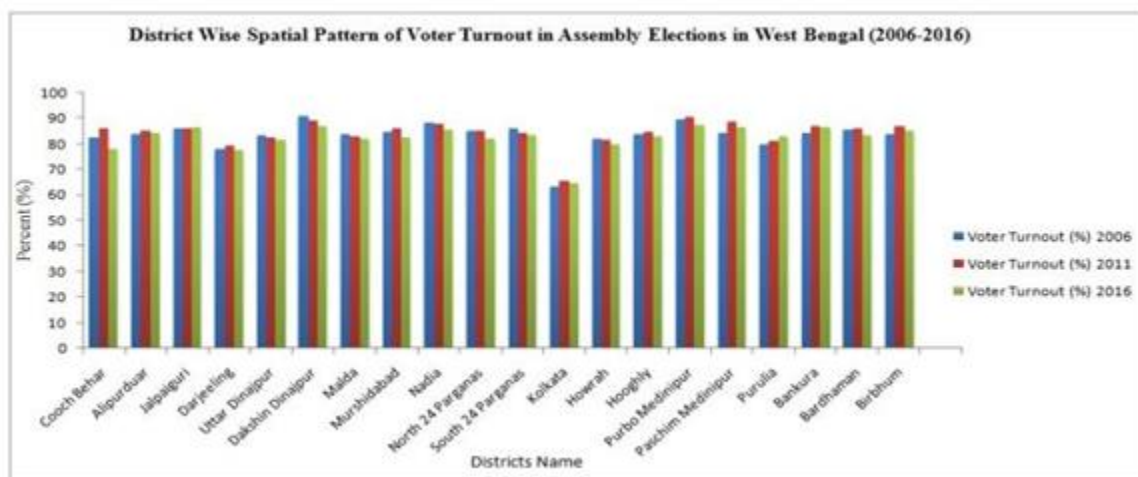


Fig 07: District wise spatial patterns of voter turnout in the assembly elections in West Bengal (2006 to 2016)

**Table 7: District wise spatial patterns of voter turnout in 2006
assembly election in West Bengal**

Categories	Voter Turnout (%)	Number of Districts	Name of Districts
Very Low	63.29	1	Kolkata
Low	63.30-79.69	2	Darjeeling, Purulia
Medium	79.70-83.98	9	Howra, Coach Behar, Uttar Dinajpur, Hooghly, Malda, Birbhum, Alipurduar, Bankura, Pashim Medinipur
High	83.99-85.96	5	Murshidabad, North 24-parganas, Burdwan, Jalpaiguri, South 24-Parganas
Very High	85.97-90.95	3	Nadia, Purbo Medinipur, Dakshin Dinajpur

Source: Based on Statistical Report on 2006 the Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The above table 7 reveals districts wise spatial patterns of voter turnout in 2006 assembly election in West Bengal. It analyzed that only Kolkata district has very low voter turnout i.e. 63.29 percent. Darjeeling and Purulia districts are fall in the low voter turnout categories i.e. 78.05 and 79.69 percent respectively. The present table 7 also depicts that 9 districts are come under medium voter turnout, it includes Howra, Coach Behar, Uttar Dinajpur, Hooghly, Malda, Birbhum, Alipurduar, Bankura, Pashim Medinipur. There are 5 districts are belongs to high voter turnout division, they are Murshidabad, North 24-parganas, Burdwan, Jalpaiguri, South 24-Parganas. Out of 5 districts, South 24-Parganas has been recorded high voter turnout i.e. 85.96 percent. The remaining 3 districts namely Nadia, Purbo Medinipur and Dakshin Dinajpur has been found very high voter turnout i.e. 88.01, 89.36 and 90.95 percent respectively (Fig: 08).

**Table 8: District wise spatial patterns of voter turnout in 2011
assembly election in West Bengal**

Categories	Voter Turnout (%)	Number of Districts	Name of Districts
Very Low	65.64	1	Kolkata
Low	65.65-82.73	5	Darjeeling, Purulia, Howra, Uttar Dinajpur, Malda
Medium	82.74-85.21	4	South 24-Parganas, Hooghly, North 24-parganas, Alipurduar
High	85.22-87.05	6	Murshidabad, Coach Behar, Jalpaiguri, Burdwan, Birbhum, Bankura

Very High	87.06-90.23	4	Nadia, Pashim Medinipur, Dakshin Dinajpur Purbo Medinipur,
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Source: Calculation based on Statistical Report in 2011 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

Table 8 analyzed that Kolkata district has been recorded very low voter turnout district i.e. 65.64 percent in 2011 assembly election in West Bengal. There are five districts namely Darjeeling, Purulia, Howrah, Uttar Dinajpur, Malda has come in the low voter turnout categories. Out of 5 districts, the low voter turnout has been recorded in the Darjeeling districts i.e. 79.40 percent. The present table 8 expressed that four districts are fall in medium voter turnout divisions. These districts are South 24-Parganas (84.29%), Hooghly (84.80%), North 24-parganas (85.20%), Alipurduar (85.21%). The district of Murshidabad, Coach Behar, Jalpaiguri, Burdwan, Birbhum, and Bankura has been found as the high voter turnout districts in 2011 assembly election. In which Bankura district has recorded highest voter turnout i.e. 87.05 percent. In the very high voter turnout categories, four districts are recorded namely Nadia(87.88%), Pashim Medinipur (88.49%), Dakshin Dinajpur (89.10%), Purbo Medinipur (90.23%). It shows that the very high voter turnout has been recorded in Purbo Medinipur (90.23%) district (Fig: 09).

Table 9: Districts wise spatial patterns of voter turnout in 2016 assembly election in West Bengal

Categories	Voter Turnout (%)	Number of Districts	Name of Districts
Very Low	64.65	1	Kolkata
Low	64.66-79.94	3	Darjeeling, Coach Behar, Howra,
Medium	79.95-83.40	8	Uttar Dinajpur, Malda, North 24-parganas, Murshidabad, Hooghly, Purulia, South 24-Parganas, Burdwan
High	83.41-85.58	3	Alipurduar, Birbhum, Nadia
Very High	85.59-87.34	5	Bankura, Pashim Medinipur, Jalpaiguri, Dakshin Dinajpur, Purbo Medinipur

Source: Based on Statistical Report in 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 9 clearly explained districts wise spatial pattern of voter turnout in 2016 assembly election in West Bengal. Since 2006 assembly election in West Bengal, Kolkata has been recorded very lowest voter turnout i.e. 64.65 percent in 2016 assembly elections. There are three districts are come in low voter turnout categories. It includes Darjeeling (77.32%), Coach Behar (78.12%) and Howra (79.94%). Out of these three districts, lowest voter turnout is found in Darjeeling district i.e. 77.32 percent. The present table 9 shows that eight districts are recorded

under medium voter turnout categories, it includes Uttar Dinajpur (81.74%), Malda (81.77%), North 24-parganas (82.11%), Murshidabad (82.33%), Hooghly (82.80%), Purulia (82.98%), and south 24-Parganas (83.35%), Burdwan (83.40%). Only three districts are come under high voter turnout divisions, it includes Alipurduar (84.19%), Birbhum (85.18%) and Nadia (85.58%) whereas Nadia district has been recorded high voter turnout in 2016 assembly elections. There are five districts are included in the very high voter turnout categories i.e. Bankura, Pashim Medinipur, Jalpaiguri, Dakshin Dinajpur, Purbo Medinipur. But very high voter turnout has been recorded in the Purbo Medinipur district i.e. 87.34 percent out of five districts (Fig: 10).

Table 10: District wise changing pattern of voter turnout in assembly elections in West Bengal (2006-2016)

S.N	Districts Name	Voter Turnout (%) 2006	Voter Turnout (%) 2016	Changing pattern of Voter Turnout (%) (2006 to 2016)
1	Cooch Behar	82.30	78.12	-4.18
2	Alipurduar	83.97	84.19	0.22
3	Jalpaiguri	85.90	86.55	0.65
4	Darjeeling	78.05	77.32	-0.73
5	Uttar Dinajpur	83.45	81.74	-1.71
6	Dakshin Dinajpur	90.95	86.72	-4.23
7	Malda	83.86	81.77	-2.09
8	Murshidabad	84.76	82.33	-2.43
9	Nadia	88.01	85.58	-2.43
10	North 24 Parganas	84.89	82.11	-2.78
11	South 24 Parganas	85.96	83.35	-2.61
12	Kolkata	63.29	64.65	1.36
13	Howrah	82.01	79.94	-2.07
14	Hooghly	83.75	82.80	-0.95
15	Purbo Medinipur	89.36	87.34	-2.02
16	Paschim Medinipur	83.98	86.36	2.38
17	Purulia	79.69	82.98	3.29
18	Bankura	83.98	86.32	2.34
19	Bardhaman	85.40	83.40	-2.00
20	Birbhum	83.96	85.18	1.22
	West Bengal	81.97	82.66	0.69

Source: Calculated by the researcher based on Statistical Report in 2006 to 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

Table 11: District wise spatial distribution of changing pattern of voter turnout in assembly elections in West Bengal (2006-2016)

Categories	Changing Voter Turnout (%)	Frequency Distribution of Districts	Name of Districts
Low	-4.23 to -2.05	8	Dakshin Dinajpur, Coach Behar, N & S 24-parganas, Murshidabad, Nadia, Malda, Howrah
Medium	-2.06 to 0.06	5	Purbo Medinipur, Burdwan, Uttar Dinajpur, Hooghly, Darjeeling
High	0.07 to 3.29	7	Alipurduar, Jalpaiguri, Birbhum, Bankura, Kolkata, Pashim Medinipur, Purulia
Total		20	

Source: Based on Statistical Report in 2006 to 2016 Legislative Assembly Election of West Bengal, Election Commission of India, New Delhi

The table 10 analyzes district wise changing patterns of voter turnout in assembly elections in West Bengal from 2006 to 2016. It shows that the voter turnout in 2006 assembly election is 81.97 percent whereas in 2011 election, it is 82.66 percent. The table 10 displays the changing pattern of voter turnout has increased i.e.0.69 percent from 2006 to 2016. The table 11 explained spatial distribution of changing pattern of voter turnout in assembly elections in West Bengal (2006-2016) and also depicts the frequency distribution of districts. There are 8 districts are recorded in low changing pattern of voter turnout. It includes Dakshin Dinajpur (-4.23%), Coach Behar (-4.18%), North 24 Parganas (-2.78%), South 24-Parganas (-2.61%), Murshidabad (-2.43%), Nadia (-2.43%), Malda (-2.43%), Howrah (-2.09%). But low change of voter turnout has been recorded in the Dakshin Dinajpur district (-4.23) percent among of them. The medium change of voter turnout has been obtained in 5 districts of the state. It includes Purbo Medinipur (-2.02%), Burdwan (-2), Uttar Dinajpur (-1.71%), Hooghly (-0.95%), Darjeeling (-0.73%) districts. The highest moderate change of voter turnout is found in Darjeeling districts. It analyzed that 7 districts are fall in the high change of voter turnout categories. It includes Alipurduar (0.22%), Jalpaiguri (0.65%), Birbhum (1.22%), Bankura (1.22%), Kolkata (1.36%), and Pashim Medinipur (2.38%), Purulia (3.29%) districts. The high change of voter turnout has been recorded in the Purulia districts i.e. 3.29% percent out of 7 districts. Table 11 finally analyzed that 7 districts has been recorded as positive change of voter turnout i.e. Alipurduar, Jalpaiguri, Kolkata, Paschim Medinipur, Purulia, Birbhum, Bankura districts whereas 13 districts has been recorded as negative change of voter turnout in the assembly elections of West Bengal from 2006 to 2016. These districts are Dakshin Dinajpur, Coach Behar, N & S 24-parganas, Murshidabad, Nadia, Malda, Howrah, Purbo Medinipur, Burdwan, Uttar Dinajpur, Hooghly, and Darjeeling districts. The figure 11 shows that western part of the state and two northern districts

i.e. jalpaiguri and Alipurduar has concentrated high change of voter turnout from 2006 to 2016 assembly elections, whereas the eastern and south-eastern part of the state has been recorded low change of voter turnout since 2006 to 2016 assembly elections in West Bengal.

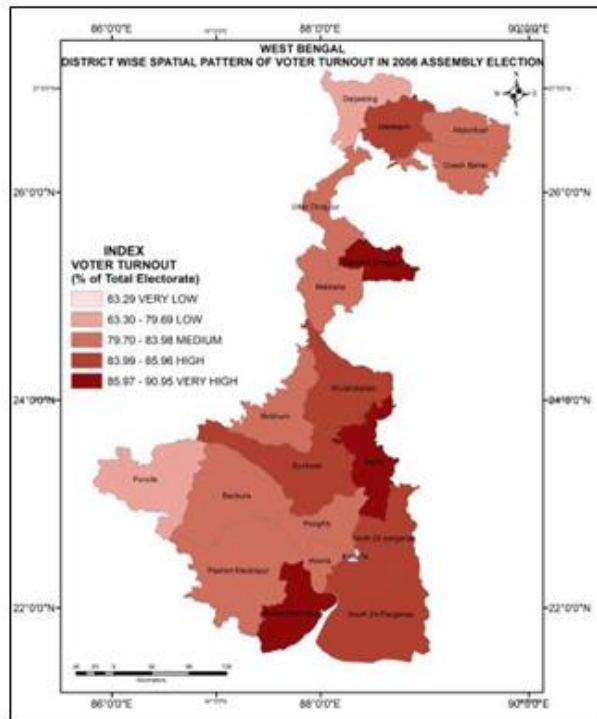


Fig: 08 District wise spatial patterns of voter turnout in 2006 assembly election

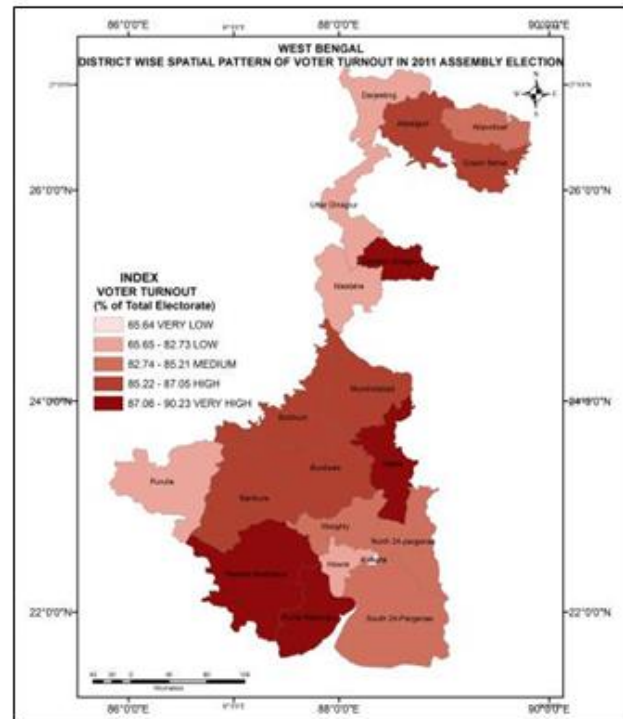


Fig: 09 District wise spatial patterns of voter turnout in 2011 assembly election

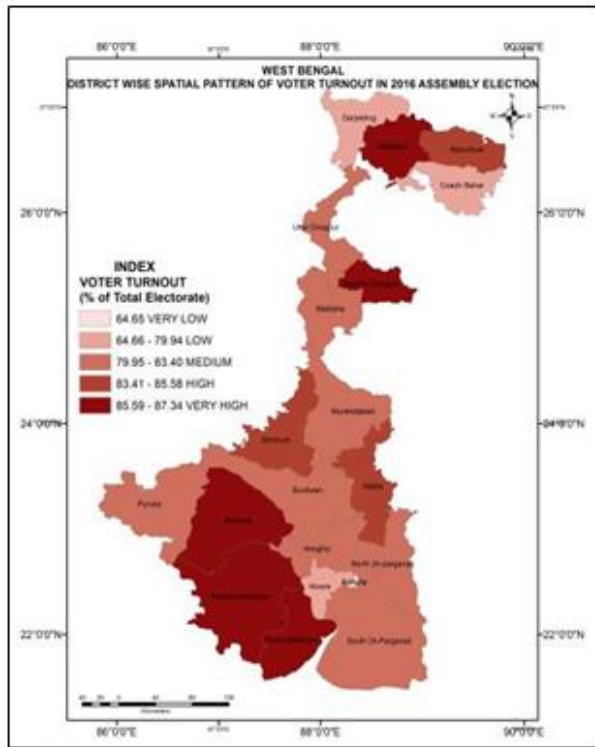


Fig: 10 District wise spatial patterns of voter turnout in 2016 assembly election

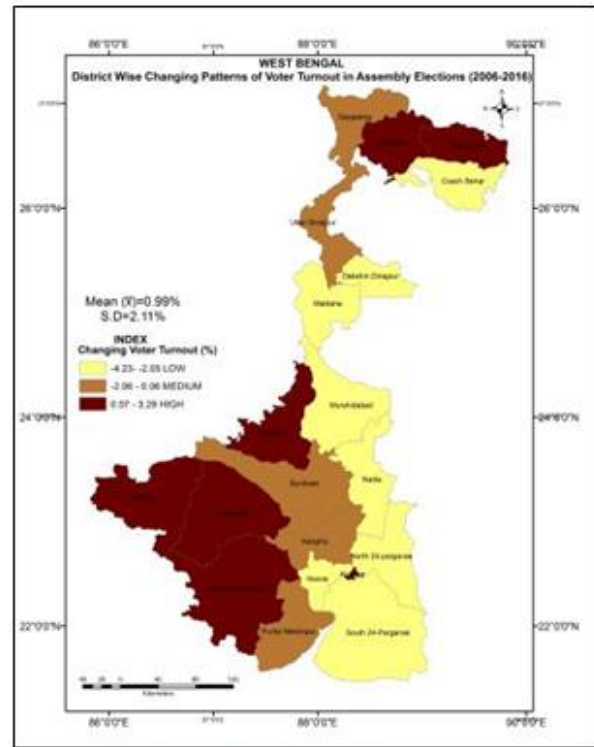


Fig: 11 District wise changing patterns of voter turnout in assembly election (2006-2016)

Table 12: Spatial pattern of Male and Female voter turnout in the assembly elections in West Bengal (2006 to 2016)

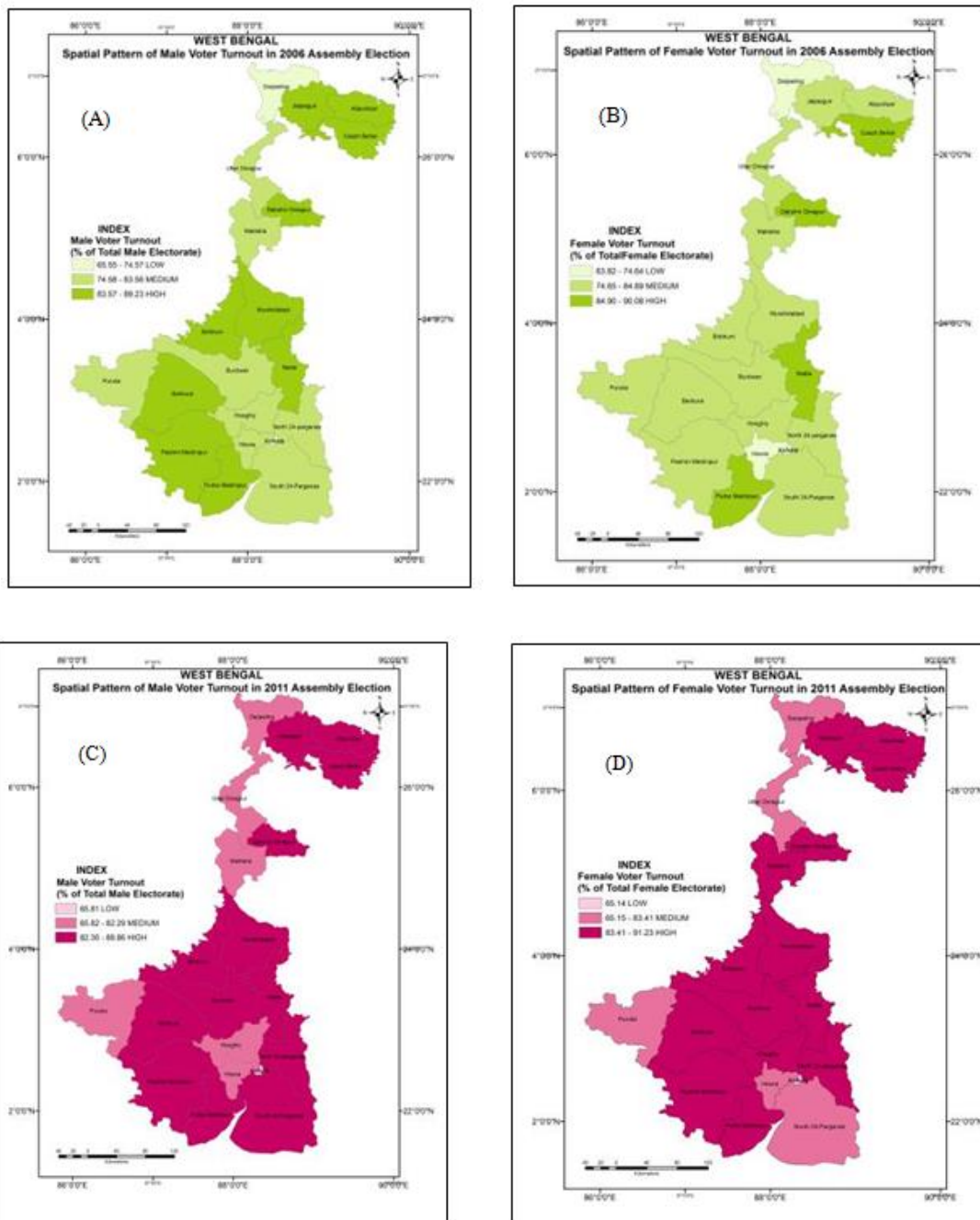
Name of the Districts	Voter Turnout(%) 2006		Voter Turnout(%) 2011		Voter Turnout(%) 2016	
	Male voter Turnout (%)	Female Voter Turnout (%)	Male voter Turnout (%)	Female Voter Turnout (%)	Male voter Turnout (%)	Female Voter Turnout (%)
Coach Behar	85.65	86.40	84.78	86.59	84.66	87.69
Alipurduar	85.35	84.66	83.89	85.56	82.02	85.30
Jalpaiguri	84.44	83.34	85.46	85.79	85.70	86.46
Darjeeling	74.57	74.14	79.94	79.50	76.67	77.07
Uttar Dinajpur	81.15	82.69	80.39	83.41	77.87	84.50
Dakshin Dinajpur	88.51	88.12	88.35	88.64	84.54	87.76
Malda	81.35	83.01	79.31	85.43	77.44	85.38
Murshidabad	84.93	84.08	85.08	86.51	79.17	84.91
Nadia	88.07	88.18	86.85	88.57	83.25	87.04
North 24 Parganas	83.56	81.67	85.61	84.25	83.07	80.08
South 24 Parganas	82.47	78.28	85.66	82.28	84.84	81.94
Kolkata	66.55	63.82	65.81	65.14	65.88	63.10

Howrah	78.58	74.64	82.29	80.77	80.40	78.54
Hooghly	83.06	80.76	84.17	84.71	82.32	82.52
Purbo Medinipur	89.23	90.08	88.86	91.23	84.59	89.57
Paschim Medinipur	86.03	84.89	87.81	88.58	81.24	86.79
Purulia	79.66	75.23	81.55	80.00	82.05	83.00
Bankura	84.63	79.84	86.88	86.55	86.20	85.97
Bardhaman	82.12	78.42	86.44	85.44	83.67	82.51
Birbhum	84.67	80.07	87.45	85.49	85.30	84.38
West Bengal	82.34	80.75	84.22	84.45	82.23	83.13

Source: Based on Statistical Report in 2006 to 2006 Assembly Election of West Bengal, Chief Electoral Officer, W.B, Kolkata

Table 12 shows the percentage of male and female voter turnout from 2006 to 2016 assembly elections in West Bengal. It is apparently shown in 2011 and 2016 elections that female have always voted more than male whereas male electorate have voted more than female in 2006 assembly election. It shows that the percentage of female voter turnout was found higher than that of male voter turnout in 2011 and 2016 elections. But the percentage of male voter turnout was recorded higher than that of female voter turnout in 2006 assembly election. In 2006 election the male voter turnout was 82.34 percent against female voter turnout of 80.75 percent while in 2011 assembly election the percentage of male voter turnout was lower i.e. 84.22 whereas the percentage of female voter turnout was higher i.e. 84.45 percent. In the 2016 election the percentage of female voter turnout is also higher i.e. 83.13 percent whereas male voter turnout is 82.23 percent. It has shown increasing trends of female voter turnout from 2006 to 2011 elections but decline to 83.13 percent in 2016 election. However, the percentage of female turnout has increased from 2006 to 2016 assembly elections i.e. 2.38 percent. It testifies and proved that the variation in male and female voter turnout is narrowing day by day and the female are more aware about their rights to electoral participation. But the percentage of male voter turnout has declined i.e. -0.11 percent from 2006 to 2016 assembly elections. The table 12 shows district wise spatial variation in male and female voter turnout in the three successive elections in West Bengal. In 2006 election, through the districts wise analysis that the highest male and female voter turnout has been found in Purbo Medinipur i.e. 89.23 percent and 90.08 percent respectively while lowest male and female voter turnout has been found in Kolkata district i.e. 65.55 percent and 63.82 percent respectively. As like 2006 election, in the 2011 election the highest male and female voter turnout has been recorded in Purbo Medinipur district i.e. 88.86 percent and 91.23 percent respectively and lowest male and female voter turnout is found in Kolkata district i.e. 65.81 and 65.14 percent. In 2016 election, the highest male voter turnout is recorded in Bankura district i.e. 86.2 percent whereas highest female turnout is found in Purbo Medinipur district i.e. 91.23 percent. While the lowest voter turnout both male and female has been recorded in Kolkata district i.e. 65.88 and 63.1 percent respectively. The figure

12 a,b,c,d,e,f has clearly shows the spatial patterns of male and female voter turnout from 2006 to 2016 assembly elections in West Bengal. These entire figures clearly explained high, medium and low voter turnout of male and female during three successive assembly elections.



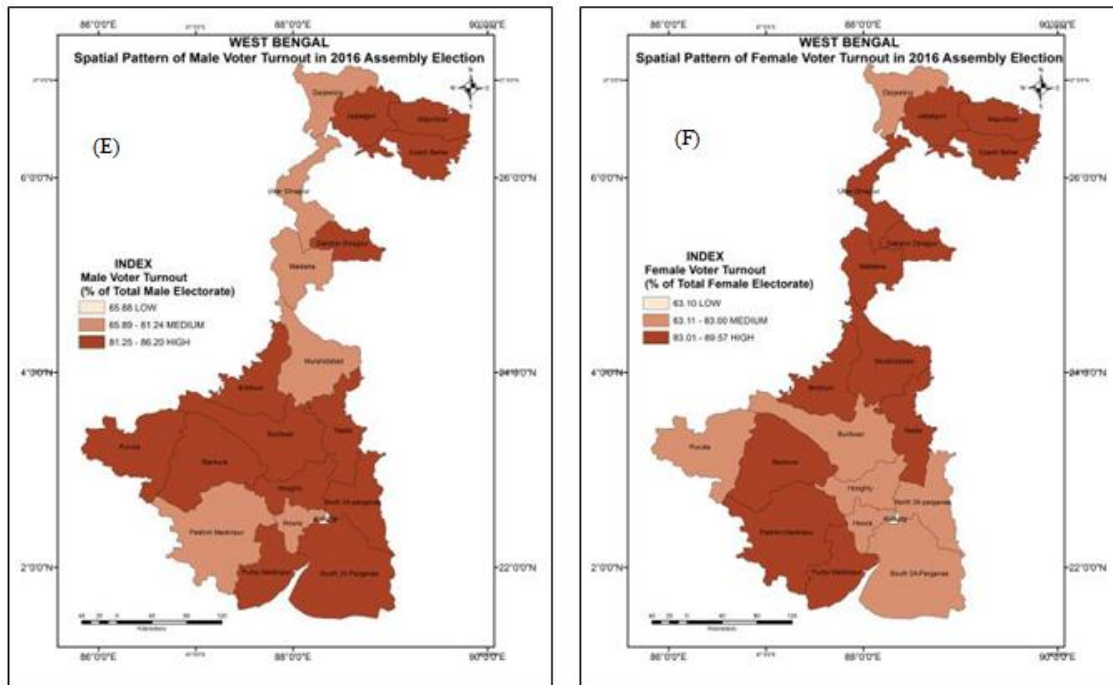


Fig: 12a,b,c,d,e,f Spatial Pattern of male and female voter turnout in 2006, 2011 and 2016 assembly elections

Effects of Socio-Economic Variables on Voter turnout:

All the three consecutive assembly elections in West Bengal have evinced that there are several socio-economic variables that affects actively and influenced the Voter turnout. Although voting is a single element of voter turnout, it tends to point out the whole electoral processes as well as important degree of underlying culture and social environment. Here, the following important socio-economic variables are independent variables and voter turnout as dependent variable.

Table 13: Lists of Selected Socio-Economic Variables

S.No.	Name of Variables
1	Density of Electorate
2	Urban Population
3	Rural Population
4	Literacy Rate
5	Working Population
6	Workers in other Services
7	Agricultural Labourers
8	Agricultural Workers
9	Scheduled Caste Population
10	Scheduled Tribe Population
11	Sex Ratio (female per 1000 male)

Table 14: Correlation Matrix showing Bivariate Correlations (Pearson’s product moment correlation coefficient) between selected Socio-Economic Variables and Voter Turnout

S.N	Variables	Assembly Election 2006	Assembly Election 2011	Assembly Election 2016
1	Density of Electorate	-0.832**	-0.846**	-0.850**
2	Urban Population	-0.722**	-0.741**	-0.754**
3	Literacy Rate	-0.232	-0.164	-0.284
4	Working Population	-0.063	-0.005	0.009
5	Workers in other Services	-0.572**	-0.681**	-0.652**
6	Agricultural Labourers	0.573**	0.679**	0.694**
7	Agricultural Workers	0.459*	0.564**	0.473*
8	Scheduled Caste	0.392	0.555*	.651**
9	Scheduled Tribe	0.133	0.101	0.273

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

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

Table 14 shows the correlation matrix between selected socio-economic variables and voter turnout in 2006, 2011 and 2016 assembly elections in West Bengal. The above Pearson’s product moment correlation coefficient clearly explained that density of electorate is strong negatively associated with voter turnout in all the three elections and there is found significant at 1% level of significance. Similar trend of strong negative relationship has been obtained between urban population and voter turnout in all the elections and significant statistical relationship has been found at 1% level of significance. The low negative relationship has been found between literacy rate and voter turnout during all elections and exists insignificant statistical relations. Except in 2016 assembly election, negative negligible relationship has been obtained between working population and voter turnout in 2006 and 2011 assembly elections. The strong negative

relationship between workers in other services and voter turnout has been found in consecutive three elections and there is found significant at 1% level of significance. In all the assembly elections, a strong positive relationship has been exists between agriculture labourers and voter turnout and recorded significant at 1% level of significance between agricultural labourers and voter turnout. The association between agricultural workers and voter turnout has been moderate positive in nature in all the elections and there is exists significant at 5% level of significance. Except 2006 assembly election, scheduled caste population is strong positively associated with voter turnout in 2011 and 2016 elections whereas low positive relationship has been found in 2006 election. There is found insignificant statistical relationship between SC population and voter turnout in 2006 assembly election but significant at 5% level of significance in 2011 and 1% level of significance in 2016. The scheduled tribe population is very week and low positively related with voter turnout in all the elections and insignificant statistical relationship has been exists between ST population and voter turnout in all the elections.

FINDING

- I. The study found that highest voter turnout has been recorded in 2011 assembly election i.e. 84.33 percent which is the highest voter turnout in the history of assembly elections in West Bengal.
- II. In the constituency wise analysis of voter turnout, the very low voter turnout has always been recorded in Jorasanko constituency.
- III. The Sabang constituency has continuously keep maintain their very high voter turnout in both 2006 and 2011 elections.
- IV. The study reveals that south-western constituencies of the state has recorded as high change of voter turnout whereas low change has been found in southern and south-east constituencies of the state.
- V. In the district wise analysis, Purbo Medinipur district has been recorded highest voter turnout in both 2011 and 2016 assembly elections.
- VI. One of the most important notable points is that Kolkata district has been found as the lowest voter turnout in 2006, 2011 and 2016 assembly elections.
- VII. In 2011 and 2016 assembly elections, the female electorate have always voted more than male electorate, but only in 2006 assembly election the male electorate have voted more than female.
- VIII. The highest male and female voter turnout has been found in Purbo Medinipur district and Kolkata district is recorded as the lowest male and female voter turnout in all the elections.

- IX. Socio-economic variables i.e. density of electorate, urban population, workers in other service, agricultural labourers, agricultural workers, scheduled caste population and sex ratio has always affected the voter turnout in all the three consecutive assembly elections.
- X. The rate of voter turnout is high in the high rural populated areas and vice versa. The study also shows that rural areas has higher voter turnout than urban areas.

CONCLUSION

Elections are known as a mirror by which we can see the true image of a democracy. The modern developed democracies have always set great emphasize on the study of election and voter turnout. Today, voter turnout is a common subject being discussed by geographers and political scientists. From the above discussion and analysis we can concluded that an increasing trend of voter turnout has recorded from 2006 to 2011 assembly election but it decline in 2016 assembly election. The 2011 assembly election has marked as the highest voter turnout ever in the history of assembly elections in West Bengal. The study shows a changing pattern of voter turnout from 2006 to 2016 assembly elections and found that southern-western part of the state has concentrated high change of voter turnout in last ten years, whereas south and south-east part of the state has been recorded as the lowest change of voter turnout in the last ten years of assembly elections in West Bengal. Through the district wise analysis, the Purbo Medinipur district has always recorded highest voter turnout, but in the same way, Kolkata district remained as the lowest voter turnout in all the three consecutive assembly elections in West Bengal. As we know that Kolkata district is the main political hub of West Bengal but their rate of voter turnout is low because of high level of urbanization. The result of Karl Pearson's correlation coefficient shows that urban population is negatively associated with voter turnout, therefore, Kolkata district has lowest voter turnout in all the elections. The female electorates are now growing conscious about their rights of voting casts. The study shows that both 2011 and 2016 assembly elections female electorates have voted more than male electorate. It shows an increasing trend of female voter turnout from 2006 to 2016 assembly elections. The Purbo Medinipur district has highest male and female voter turnout but Kolkata district has again lowest male and female voter turnout in all the study elections in West Bengal. The present study reveals that voter turnout has affected by several socio-economic variables i.e. density of electorate, urban population, sex ratio, rural population, agriculture labourers, agricultural workers, scheduled caste population.

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