

Indian General Election Analysis 1977-2014

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Abstract—Women in different societies are often restricted from participation in the political field. There are changes in the status of women in the last few decades as women are rising in the public domain. Women have been under-represented in political participation and decision making in India. Our objective in this paper is to study different factors and reasons using statistical data on how women participation has changed and finding the empirical evidence if women participation is really growing.

Index Terms—Women, winning, social science

I. INTRODUCTION

Women empowerment in the light of women's political presence gives the opportunity for diversity in governance (Afridi, Iversen, Sharan, 2017). As per UNDP 2013 the Gender Inequality Index and Global Gender Gap Index, India stood at 136th of 186 countries and 105th of 135 countries respectively. It is noted that economic participation and opportunity is a sub-component of the Gender Gap Index. Gender Gap Index of India is at 123rd rank of 135 countries. (Ghani, Mani, OConnell, 2013). In India, a large number of women do not participate in the labour force. In 1991, 22 per cent of the women were in the workforce compared to 52 per cent of men. In recent years, a large portion of women have turned out to vote and the gender gap is decreasing still the political participation of women is not well represented. In light of this, Parliament and state legislative assemblies have passed amendments 73rd and 74th in the Constitution to address the issue of low participation of women in local governments, where one-third of the seats would be reserved for women including the Chairman position in the local government at the grass-root level (village level). This law mandates that women be elected for these positions and make women active in political life (Chhibber, 2002). India is trying to increase

the representation of women in the Parliament by trying to reserve 33 per cent of all seats to the Lower House of Parliament by introducing 108th Constitutional Amendment Bill 2008, which is still pending past 11 years (Constitution of India BE, 2008). This paper we focus on the historical data of national elections from 1977-2015. Our focus is in understanding if there is growth in women winning. We have used participation, vote share, year on year growth of vote share and political party affiliation to understand if these could be the reason that impacts women winning in the national election, by calculating the participation gap, productivity gap and year on year vote bank growth respectively. Our analysis was quite interesting as we found unseen relations between these factors and winning.

II. RESEARCH QUESTIONS

Our main research question is "Women winnings in the national elections in India, is it steadily growing over the years? Why? What are its implications?"

The sub-questions that help to answer the main research questions are:

- a) Participation of women in the general elections over the years
- b) Total vote share received by women candidates
- c) Year on Year (YoY) growth of votes obtained by women candidates
- d) Winning of women in the general elections over the years

We have detailed candidate level data for the Indian national election that took place between 1977 to 2014. Our focus is on the women winning in these national elections over this period. Our motivation for this research question was, even though Article 15 of the Indian Constitution upholds no person shall be discriminated based on the religion, race,

caste, sex or place of birth. We find a very small number of women winning in the national elections. We wanted to investigate based on the national election data by considering the following factors. We decided on four factors, which we planned to investigate as their relationships would give more insight into our final research question. Firstly, the participation of women over the years, as it would indicate if there is growth in it as more participation might lead to more winning. Second, total vote share received by women, just participation might not result in an increase in the support for women. If there is growth in vote share then there is a higher chance for women candidate winning. Third, Year on Year growth of votes, it would tell us if there is a variation in the growth if there is a variation then by what amount as this would indicate if there is consistency in change or there is an abrupt change. Forth, winning of women in general elections, here we used the party system in India. We divided into the national party, the state party and independent to understand if women need to be in any of these three groups to increase the chances of winning. We believe these four important factors would guide us in understanding the why part and implication in our final research question.

III. DATASET

Indian Election data comprise the candidates detailed data for India's national election. This data is from 1977 to 2014, every 5 years candidates from all over India stand in the national election from a party. Initially, between 1977 and 2000, the Indian national elections have been set up with a year gap of less than 5 due to political instability. Altogether the dataset used for analysis consists of 73082 candidates from Election year 1977 to 2014. The candidate's details are clustered and grouped in such a way that results from the dataset can be extrapolated to calculate several fields, including turnout, vote shares, winning status, the effective number of parties and so forth (Bhavnani, 2014). Data is available for download off the web at no cost under CC0 "Public Domain Dedication" license through Harvard Dataverse, this is a web application which has a repository of 75,000 datasets in this website the researcher and data creators can prepare and keep the data. All records are completely de-

identified for Indian election participation information. Participating candidates (and their party) vary for different election years. The dataset is in the form of excel file which allows easy to access and use although there is not much description of the dataset present on the website of Harvard Data verse. It is also important to note that data of the candidates have sourced from Election Commission of Indias reports and field visits as per the notes provided on the website.

Before using the data for analysis we did some Pre-processing on the data

- 1) Handling errors in data values spelling errors in party names and abbreviations of parties. Also, there were spelling mistakes in the name of the state for some years.
- 2) Calculated winner for all constituencies, added as a column variable (binary value) To find the winning trends we created the winning column to store the election result for every candidate of all the years. Which holds the value 0 or 1 if the candidate won the value will be stored as 1 and if the candidate loses in that election, the algorithm will store 0 in that candidates row. We had to group the whole data sets according to constituencies in each year to find the respective winning candidate.
- 3) Calculated party type representation for winning candidates, added as a column variable (ternary value). In order to correlate winning with party type we created a column in which party type will be assigned to the candidate based on partys abbreviation name the party type is classified in 3 value (N, S, I) where N represents the national party S represents state party and I represent independent party. This column uses dataset which was created manually by providing the list of national party per election year as national party-list has been changed during these election years.
- 4) Classified the overall Indian states into regions, added as a column variable (String value) To find out the trends in a different region of India we have divided the states into 2 clusters. These clusters are named as north and south region which will be further discussed in Methods & Research Approach.

The variables in the national election data file are (Bhavnnani, 2014):

Variable name	Storage type	Variable contents
Year	Int	General election year
pc_no	Byte	Parliamentary constituency number
pc_name	str25	Parliamentary constituency name
pc_type	str3	Parliamentary constituency type
cand_name	str70	Candidate name
cand_sex	str1	Candidate sex
partyname	str57	Party name
partyabbre	str10	Party abbreviation
totvotpoll	Long	Votes received
electors	Long	Number of registered voters

IV. METHODS & RESEARCH APPROACH

To depict the role of the woman in Indian Lok Sabha Elections and their winnings four methods are used. Elections are usually a complex process where the results depend on many various aspects. One important aspect for winning in elections is the party with which the candidate is contesting representation. Woman winnings also depend on the place where she is contesting because the place may or may not be very supportive of the woman candidate. The elections in India is prevalent male-dominated. So it is important to check into different aspects to get an idea about the woman winning and participation. The four different methods used in this paper are listed below.

A. Participation Gap

It is already mentioned that the Indian elections are male-dominated but with the years passing by the difference is decreased or not is to be checked to know the trend. Hence the method was utilized. The number of candidates in each year with respect to the different region was considered. Participation Gap was taken as the ratio between the Male candidates and the female candidates in the selected region for the year. Increase in Participation Gap will show that the number of women has been in rising to come in par with the number of male candidates. This will show how willing are the women in the nation to participate in the election and to represent people in the administration. In this paper, we used the following equation as the productivity gap (Avila-Santamaria Useche, 2016)

Participation gap =

$$\frac{\text{Number of the female candidates}}{\text{Number of male and transgender candidates}} * 100$$

This value will show significant participation difference between the male and the female candidate since it is the ratio between two different entities. Thus a change in the values of numerator and denominator will directly reflect on the output

B. Productivity Gap

This is to show female candidates who have won the election out of all the participated woman. This figure will give us insight into how the voters of India has been supporting the woman participants. We wanted to check how the women participants have turned out to be a member of the Indian administration. Thus the formula was derived. The values vary from 0-1 and the higher the values higher the conversation rate. (Avila-Santamaria Useche, 2016).

Productivity gap =

$$\frac{\text{Number of the female candidates won}}{\text{Number of female candidates participated}} * 100$$

As mentioned in the previous method here also for the productivity gap we have exploited the concept of ratio to get the clear picture of the productivity gap.

Modified version of the above mentioned formula is also used to find out the conversion rate of the woman candidate which contested for a popular party. This method give us hindsight about how the people has supported party or the woman candidate.

Productivity gap (PartyBased) =

$$\frac{\text{Number of winning female candidates for the party}}{\text{Number of female candidates participated for the party}} * 100$$

C. Year on Year growth

This method is used to check if the vote share received by the woman is increasing each year with respect to the previous year. This conveys that the support for the women is increasing even

considering the case where the woman participant did not win but still managed to get votes from the people. The equation is formulated on the basic idea from the profit growth of financial records. Here we take the ratio of the vote share of the woman and the total vote cast in that respective year. The ratio is similar to normalizing of the values so that it can be easily interpreted.

$$YoY Growth =$$

$$\frac{\frac{\text{Total vote for women current year}}{\text{Total vote casted}} - \frac{\text{Total vote for women previous year}}{\text{Total vote casted}}}{\frac{\text{Total vote for women previous year}}{\text{Total vote casted}}} \times 100$$

D. Classification of Indian states

Since India is the 7th largest country in the world, we felt it is important to find any trends that are the results of the diversified community. One of the main reason for the different inclination toward politics can be due to different states because each of them is based on their language. So they tend to show the same interests. Thus we decided to split the Indian states on the basis of geography. We divided the country to different areas called North India and South India. The north cluster contains all the states which are above the Vindhya range which is the midpoint of India geographically. The south cluster contains all the states which are below the Vindhya range.

V. ANALYSIS AND RESULTS

The general election 2009 results were exceptional in the history of the Indian elections in terms of women winning being the highest. For the first time, women representation in Lok Sabha (House of the People in India) had crossed over the significant threshold of 10%. The winnability of a candidate is an important parameter for the performance of political parties and politics being a male-dominated domain, political parties are always reluctant to nominate women for elections. However, the proportion of women candidates in elections did not change rapidly but it has increased gradually which depict the fact that women are being supported by political parties. The increment in women representation cannot be attributed primarily to the only

factor of the decreased reluctance of political parties to nominate more women candidates. Since, from the empirical data analysis, we find that citizens are supporting women by giving their votes, which encourages more participation. Furthermore, blatant differences can be observed in the nomination of women candidates by political parties across different party types, states and regions.

The political empowerment can be measured using three variables (Vezhaventhan et al. 2018):

- 1) ratio of females to males in the parliament
- 2) ratio of females to males at the ministerial level
- 3) ratio of number of years with a female head of state to years with a male head of state

In our analysis, we choose the first variable to depict the political empowerment of women. Moreover, since elections in 2014, a new category for candidate sex type has been introduced to ensure the involvement of transgenders as well in politics. Hence, hereby we extend the underlying basic definition and we measure the ratio of females to males and transgenders participated to measure the participation gap. As evident from the analysis, we can see that the participation gap has monotonously increased gradually over the years. Even though women participation has increased, the gap was observed to be increasing as well. The reason is the fact that the number of male candidates is comparably quite higher than the number of female candidates. So despite an increase in women participation, the participation gap has increased as an overall trend. For instance, 70 women participated in the election year 1977 while 668 women participated in the election year 2014, which shows almost 10 times increment. While on the other hand, 2369 men candidates participated in the election year 1977, while 7578 men candidates participated in the election year 2014, showing almost 3 times increment. Even though after 10 times increment in participation numbers, the number of women candidates are still a fraction (only 10%) of all men candidates. Due to this reason, even though female participation has increased over the years, the participation gap has been observed to be increasing.

On a deeper analysis we found women participation in central India which contains states Madya Pradesh and Chattisgarh, in the year 1977

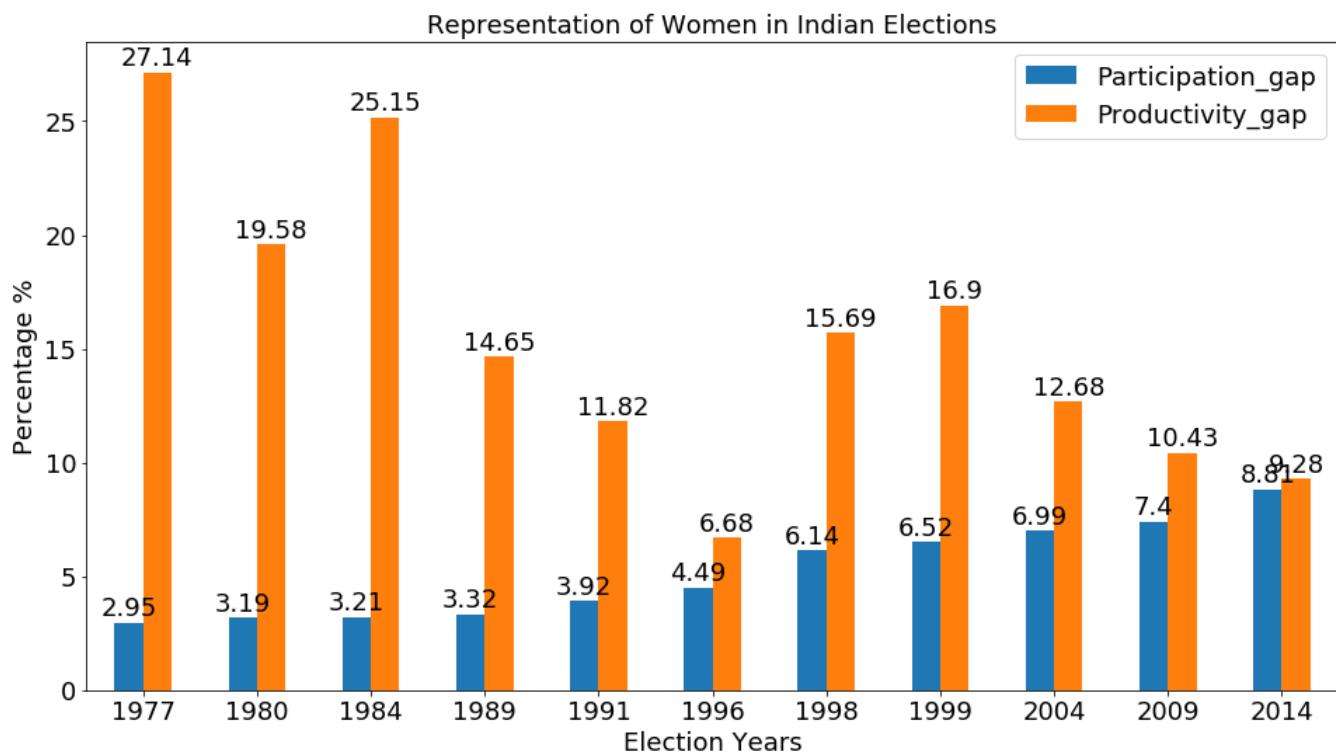


Fig. 1. Representation of women in Indian elections

the women participation was 1 women candidate for 151 male candidates and in the year 2014 was 1 women candidates for 9 male candidates, we observe there is an exponential growth of around 16x times. As compared to other regions which have grown in a linear fashion.

We observe that the average participation gap is 5.17 percentage. After the 1996 general election, never the participation gap matrix went below 5.17 percentage; this is a good sign for women candidates and a huge boost.

Furthermore, we observe that the productivity gap has not monotonously increased or decreased as an overall trend. However, if we look at the last 4 elections, i.e. in the last 20 years, we observe that the productivity gap has decreased continuously. The primary reason is that a higher number of women are able to win the elections when compared with the number of women participated in the first place. If we compare the election year 1977 and 2014, we see a 10 times increase in women participation, however, the number of winning women candidates have been grown just by 3 times. We observe the average productivity gap is 15.45 percentage since

1977. We have found, out of 11 elections there are 7 elections where the productivity gap has fallen below the average. The last 3 elections 2004, 2009 and 2014 is showing a downward trend below the productivity gap average. In 2019 elections 723 women participated out of which 78 seats won by women which leads to 10.78 percentage as per the Election Commission of India. This indicates the fact that even though a higher number of women are participating in elections, however, the number of winning women candidates as compared with participating women candidates is comparatively lower.

As women participation has increased over the years. It is a worthwhile idea to find out which type of political party the winning women candidates belong to? To measure this, we segregate winning women candidates in three clusters, the first cluster having representation from national parties, second one from state parties and the last one from independent representations. The winnability of women candidates, combined with representation from a particular type of political party give us insightful information as depicted in the graph.

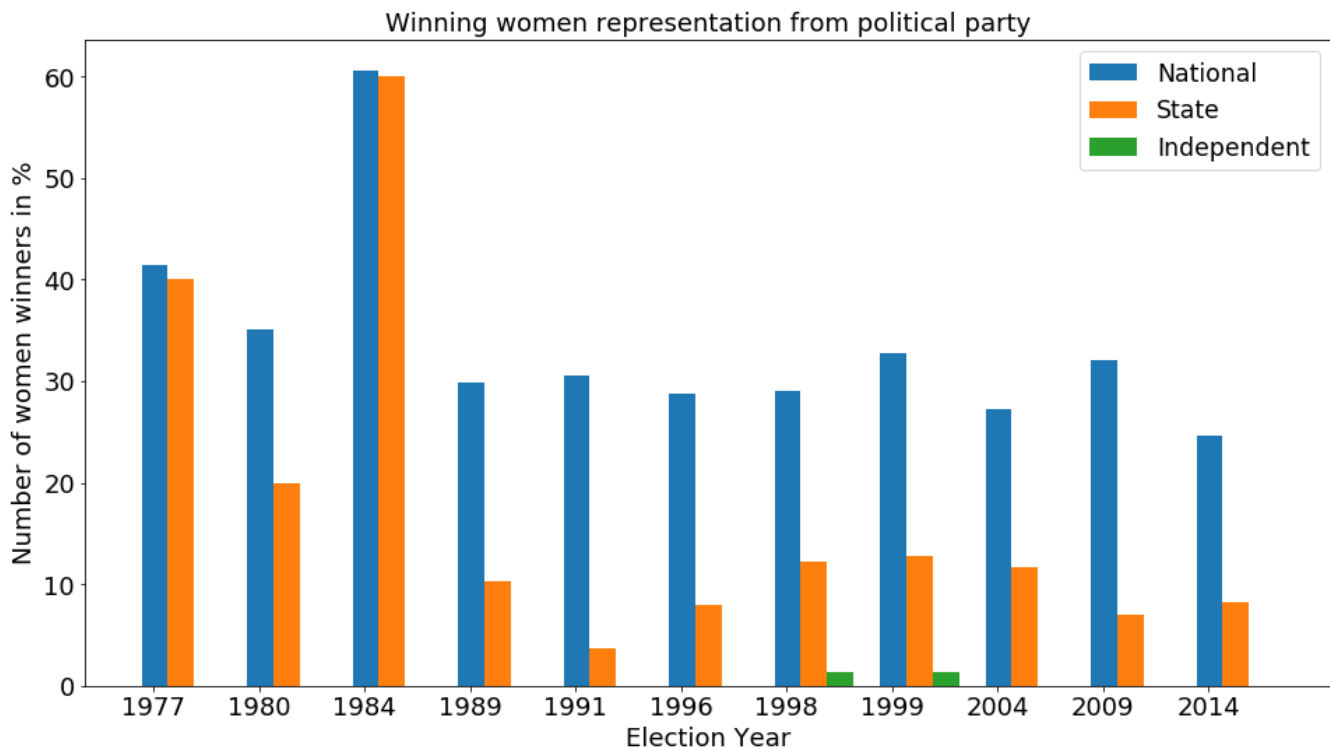


Fig. 2. Political party affiliation for winning women

The winning women representation from national parties has been observed to be comparatively quite higher than representation from state parties. As we find from analysis, only in two election years, this winner women representation from state parties was almost comparable with national parties, in the election year 1977 and 1984. Overall, to ensure better chances of women candidate to win the election, the representation from national parties has turned out to be a better strategy. Furthermore, the winner women representation as independent candidates have been observed to be almost negligible as an overall trend. As an interesting finding, we find that only two women candidates have won the election, one each in the election year 1998 and 1999 respectively. This gives us an insight that women candidates from independent representation have almost negligible chances to win the election. Although winning as an independent candidate has not been difficult only for women, but also for men candidates. The trend observed from historic data has proved to be true in results from election happened in 2019 too. Out of 543 seats contested, only 4 candidates could win the election being an in-

dependent candidate, and no gender gap is observed there since two women candidates and two men candidates were able to win the election with independent representations. Though the reason behind such low representation for independent candidates is evident, however, it is not researched enough and is a potential candidate for further research work in future. To measure the representation of women in politics, we can look at another variable to find if women are being welcomed and accepted in politics by calculating the vote share obtained by women candidates. Also, we looked into the growth on a year-on-year basis of total casted vote share obtained by all women candidates. For this, we calculate total casted vote share obtained by women candidates in the current election year and compare it with that from the previous election year. To look into differences between regions of India, we grouped all data into two clusters, namely north India and south India. From the results of the analysis, we find that total votes obtained by women candidates have increased as an overall trend in both northern and southern parts of India. Also, we find that as an overall trend, the growth on a year-on-

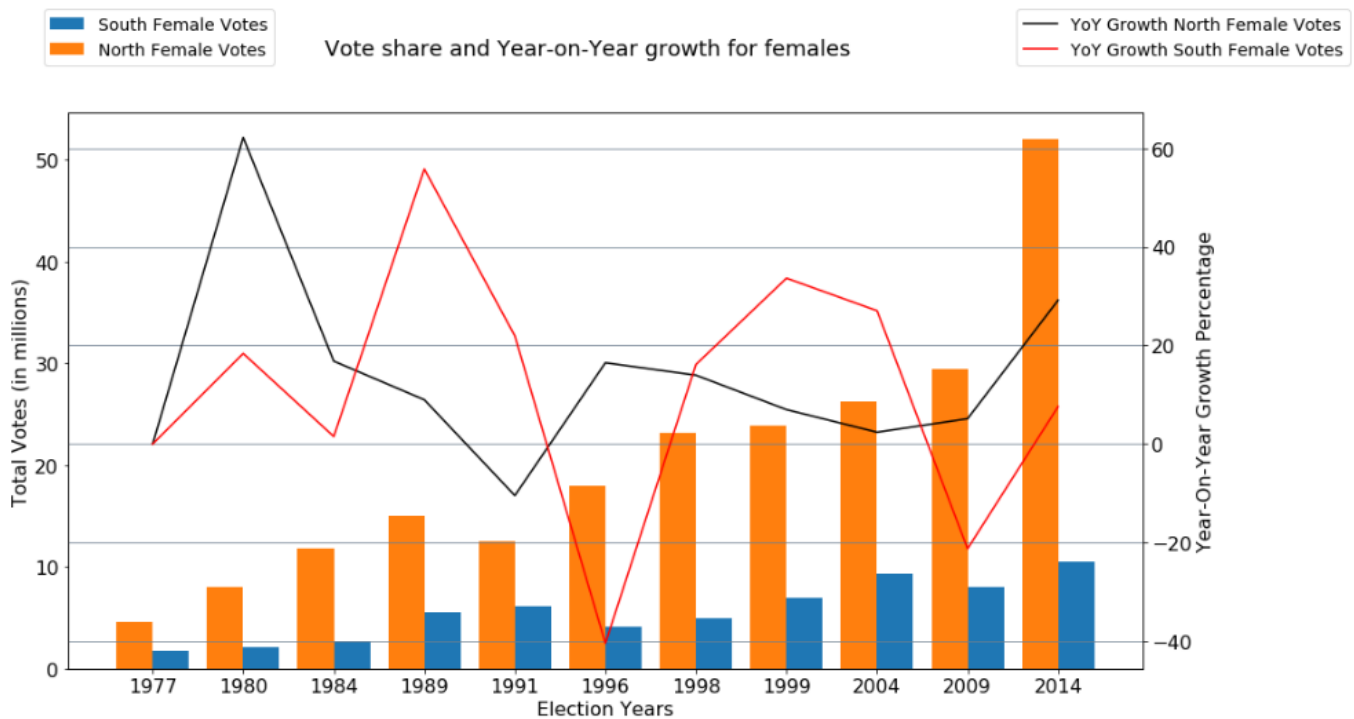


Fig. 3. Vote share and Year-on-Year growth for female candidates

year basis has been observed to be positive. Just as an exception for the particular election year 1991 when compared with 1989, the growth has been found out to be negative, with north Indian women candidates votes being 15 Million in 1989, while the same variable having value being 12 Million in 1991. Similarly, for the southern part, we find that as an exception, the growth of total casted vote share obtained by women candidates has been negative, in the election year 1996 when compared with the election year 1991. However, as an overall trend, the vote share growth has been positive for both northern and southern parts of India. Since political parties are often reluctant to give chances to women candidates due to historical low winnability. Our hypothesis is that since the number of votes obtained by women candidates has increased and also, the growth of vote share of women candidates has been observed to be positive, which implies that people are accepting women in politics by giving their valuable votes to women candidates.

VI. CONCLUSION

To conclude, over the election years the participation of women candidates, the total votes obtained

by women candidates, and political party support for nominating women candidates have been increased which is a good indication for women representation in Indian national elections. Also, when compared with male counterparts, the success rate of female candidates is observed to be high. For instance, in the election year 2009, the success rate was 11% for women candidates, while the same was only 6% for men candidates.

Even though the participation has linearly grown over years and linear growth in the year on year vote share, but it has not resulted in the increase of winning candidates compared with participation. Only one woman won to 11 women participation during the 2014 election as compared to only one woman won to 4 women participated during the 1977 election.

Even though women participation, representation in parliament as increased, still they are under-represented because of lack of women representation in decision making and policy creation positions. Also, the women reservation bill is pending in India since 2008, which will ensure 33% reservation for women. Since the similar bill for

women reservation in local elections has proved out to be better. The women representation in national politics in India has achieved the highest 14% in 2019 election year, still, it is far below the global average of 21%. The main challenges for women representation are proxy candidates fielded by parties to divide the vote share, various socio-cultural, religious and economic barriers, and gender-specific electoral violence, especially through the use of information and communication technologies.

A. *Related work*

The research paper 'From a Small to a Large Minority: Women in Scandinavian Politics' (Dahlrupe, 1988) goes into the topic of a 'critical mass' of women to make a difference in politics. They check 6 aspects where the minority has a significant impact on political culture.

The first aspect: Changes in the Reaction to women politicians, increase in the number of women in power reduces or makes insignificant the open resistance they previously faced.

The second aspect: Changes in the performance and efficiency of Women politicians, Quote: 'According to these studies. women politicians feel less satisfied with their job than their male colleagues. but nevertheless, they stay on with almost the same frequency. So even if they constitute 20 to 30 per cent today. women politicians have not obtained what one could call equal opportunity of carrying out their work as politicians.'

The third aspect: Change in political culture, Women mostly adapt to the existing culture but they also change the existing culture as their proportion increases. The base culture like high conflict, however, has not changed.

The fourth aspect: Changes in the political discourse, The way issues related to women and the priorities assigned change as the number of women increase.

The fifth and sixth Aspect: Change in policy, and change in women's power, by making coalitions and by few critical acts on crucial issues women makes the whole minority is empowered.

The paper also discusses the various problems associated with women as a minority and asks the question: Is the concept of critical mass relevant? for answering this question the researchers take some

qualitative approaches, interviews from 28 Nordic women politicians, results from questionnaires sent to all national political parties in the 5 Nordic countries and the results of a questionnaire sent to all women's organisations and equality committees within the same political parties at the national level.

This research paper focuses on studying the performance of female political candidates in the Indian national elections.

One of the literature that we reviewed is 'Political Empowerment and Participation of Women in India' (Nisha & Vezhaventhan, 2018). In this research paper, the authors focused on the importance of the empowerment of women as it would solve many other problems of society.

They note that the representation of women in decision making roles is less world wide. In India, in particular, the women who can make a decision in the legislature has been less.

This underrepresentation can be due to many factors. The Indian constitution has many provisions to ensure gender equality. The factors covered are discrimination based on sex, class. Protection from crimes that affect women disproportionately like human trafficking and forced labour.

To ensure equal Representation the Indian constitution also has a concept of reservation. Under this provision, there is a minimum percentage of participants in an election that have been required by law to be women.

The initial enactment of the law making the minimum participation requirement was known to be good for the performance of women providing a sense of equality for them. Research and statistics show that more measures are required to further improve the Participation and therefore the Representation of women. Other countries like the UAE and even smaller countries like Nepal and Afghanistan have higher women representation.

There can be many reasons for the underrepresentation of woman, few that were considered in this research are social, cultural factors in which traditionally women were not involved/interested in politics as it is a man's job. Religious aspects and economic aspects as in these 2 aspects as well women are generally faring lower than men in a similar social setting.

They note that in particular economic resources are a major factor for lack of good participation of women. Most women are not financially independent and not only does this make it harder to pursue ventures like politics but it also causes a lack of certain required professional skills that a person would require in a field like politics.

B. Research question and methods used

The research paper considers the question of women participation when compared with other countries for this they use a few measures: Ratio of females to males at the Parliament, and ministerial levels. They also calculate the ratio of the number of years a state had a female head of state to the number of years a state had a male head of state.

They note that over time the participation and winning of the women have improved in recent times and are continuing to improve. They look at the various laws passed related to protecting against discrimination of women and other minorities. They also found that despite these laws passing the participation has not improved significantly.

The paper has a description of some specific problems describing why the participants did not improve despite the provisions provided, for example, the use of a woman as a proxy candidate for a male family member. Other factors are social and cultural in nature which is hard to change in smaller time-frames.

The paper concludes with some suggestions to improve the status quo, they point to the lack of quality education. This would provide women with the necessary knowledge about their rights, provide them with an opportunity to secure their own financial freedom. The social aspects need to be improved as well such as the provision of safety against gender-based violence that can provide more confidence to women.

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VII. APPENDIX - CONTRIBUTION

Table of Content	Primary Contribution	Secondary Contribution
Abstract, Introduction & Research Question	Sharatkumar Shantaram	Atul Sharma
Dataset	Atul Sharma	Mrudul Bhanu
Methods & Research Approach	Mrudul Bhanu	Manjunath Shankar Aditya Mehta
Analysis & Result	Aditya Mehta	Sharatkumar Shantaram Atul Sharma Manjunath Shankar
Conclusion	Manjunath Shankar	Aditya Mehta Sharatkumar Shantaram Mrudul Bhanu