

# Spatio-Temporal Variation in Sex Ratio and Growth of Population in Rajasthan: A District Level Study

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**Abstract:** Sex ratio, which is defined as the number of females per thousand males, helps us in understanding the socio-economic and cultural status of the study area. Sex ratio is one of the most important aspect of demographic study because it helps in understanding the relative survival of both male and female population. When the number of females exceeds that of males, sex ratio becomes favorable and it becomes adverse when the number of males exceeds to females. Sex ratio in Rajasthan as well as in India as a whole remained adverse to women, because it has been declining decade after decade. Present paper studies the spatio-temporal variation in sex ratio and growth of male and female population in Rajasthan at district level. Through this research paper, we will also analyze the various reason behind this declining sex ratio. In a state like Rajasthan sex ratio becomes a key factor in understanding the development, because sex ratio has got both demographic and socio-economic implication because the inequality between the growth of male and female population has been associated with several socio-economic factors. Due to cultural preferences in our country as well as in Rajasthan, gender discrimination is a common problem. Right from her own house to other places, women have to face discrimination, everywhere. As we know that Rajasthan the land of kings is known for its women folk who remained valiant, but in today's patriarchal society women are leading a backward existence. Rajasthan the largest state of India and 8<sup>th</sup> most populous state, makes up 5.6 percent of country's population in 2011, lags behind national average in terms of sex ratio by 15 points, with a sex ratio of 928 females per thousand males. A preference for son over daughter is deep rooted in the culture of Rajasthan, which has got important socio-economic implications and influences the fertility and mortality. Despite, modern day progress and women's day celebration gender discrimination and inequality is dominant in Rajasthan. Present paper is mainly based on secondary sources of data collected from various government offices and website of Rajasthan government. To analyze the spatio-temporal variation in sex ratio and growth in male and female population, simple percentage method has been applied and different cartographic techniques like line growth and choropleth maps have been used for the comparative analysis.

**Keywords:** Sex Ratio, Spatio-temporal Variation, Growth of Population, Rajasthan Trend of population growth

## 1. Introduction

Sex ratio is one of the most important aspect of demographic studies, because socio-economic and cultural status of an area is affected by sex ratio. Sex ratio has been defined as the number of females per thousand males in India. In other words it is a ratio between female and males population. Sex ratio reflects the biological, social, economic and migration characteristics of the population. Therefore, it acts like a key factor in various types of planning, which helps in the development of any region. Because of the imbalance in sex ratio, a lot of problems may crop up like, lower fertility and slower growth of population. To understand the various demographic attributes of any region like Rajasthan, an understanding of sex ratio of human population and growth of male and female population in terms of spatial and temporal variation at district levels, will be of utmost importance.

Due to cultural preferences in India and especially Rajasthan gender discrimination is a common problem, like other Hindi speaking state like, Bihar, Madhya Pradesh and Uttar Pradesh. Right from her own home to other places, women have to face discrimination, everywhere. It is deeply rooted in the cultural fabric of Rajasthan. Historically, Rajasthan is known for its women folk, who remained valiant, but in today's patriarchal society, it fails to present the status of women as, it was in the past and women are leading a backward existence. Rajasthan the largest state of India, and the 8<sup>th</sup> most populous state, makes up 5.6 per cent of the country's population in 2011 and 5.4 percent in 2001, lags behind national average in terms of sex ratio by 15 points,

with a sex ratio of 928 females per thousand male. A preference for son over daughter is deep rooted in the culture of Rajasthan, which has got important social and economic implications and influences the fertility and mortality, substantially. Not only in Rajasthan, but in all the Hindi speaking state of India, girls are considered to be a liability, because of high expenditure in weddings as well as dowry system. In spite of the fact that in Hindu culture it is sacrament to give a daughter away to groom selflessly in marriage, like Kanya Daan. Son preference is responsible for many discriminatory practices against girls, like food, health, clothing as well as education. Female infant and child mortality is greater than the male child because of discrimination against girls in healthcare and nutrition. Attaining gender justice is not an easy task in Rajasthan. Girl child has been considered as unwanted and burden on parents. Female foeticide and infanticide are the reflection of discrimination against girl child even before her birth. Majority of women of Rajasthan even in other parts of India are unable to enjoy the rights and privileges, as it has been provided equally for both men and women by the constitution of India. Gender discriminants may be attributed to poverty, illiteracy, unemployment, social belief and custom as well as attitude of the society against women encouragement in all walks of life.

Therefore, we can say despite modern day progress, and women's day celebration, gender discrimination and inequality is dominant in Rajasthan. If we go through the girl child sex ratio, we find that since 1961, it has been continuously declining and 2011, registered a steep decline in girl child sex ratio (0-6 years) from 909 in 2001 to 883 in

2011, which is markedly below the average girl child sex ratio of 915 in India. Rajasthan, a patriarchal society, deeply ingrained customs and traditions, which passed down through the generations, has comfortably accepted the discrimination against girl child. Rajasthan is the state, where percentage of women married between the age of 10-14, is highest and recorded as one of the lowest sex ratios.

## 2. Study Area

Rajasthan the land of kings is the largest state by area in India. Rajasthan with a total area of 342239 sq.km. is located between 23°30' to 30°11' North latitude and 69°29' to 78°17' East longitude. The study area lies along the international border with Pakistan in the famous Thar Desert of Indian subcontinent, which itself occupies 19.84 million hectares or 58 percent of the geographical area of Rajasthan state and 6 percent of the geographical area of India.

Rajasthan, which is located in the northwestern part of the country is bounded on the west by Pakistan whereas, on the north and northeast, it is bounded by Punjab, Haryana and Uttar Pradesh. Apart from this Uttar Pradesh and Madhya Pradesh lie on the east and southeast boundary, whereas, Gujarat is located on its south west boundary. The area is devoid of natural drainage except river Ghaggar and a small stream, known as Kakni in Jaisalmer. The climate of Rajasthan is variable throughout the state. The rainy season lasts for very short period from mid-July to first week of September and east of Aravali mountain receives comparatively better rainfall and humidity than the western side which is very hot and dry in summer season but very cold in winter season. Western part of Rajasthan may be classified as arid plain according to Thornthwaite's method of classification, which experiences exceptionally strong wind, flowing from south-west to north-east and causes wind erosion.

The study area is thinly populated because of this harsh climatic conditions. According to 2011 census, total population of Rajasthan is 68 million, which is 5.6 percent of the total population of India. Out of the total population of Rajasthan, nearly 7.5 percent resides in the rural areas. The average density of population in Rajasthan is 200 persons per square kilometer, which is much below the national average density of population (382 persons per sq.km.). Like other states in India, the number of female is less than the number of males. Out of the total population of Rajasthan almost 51.86 percent are male population, whereas, 48.13 percent are females, which gives a sex ratio of 928 females per thousand males, which is 15 points lower than the national average sex ratio of 943 females per thousand male. The decadal growth rate of population in Rajasthan is 21 percent, which is the eleventh highest growth rate in the country. The overall literacy rate of Rajasthan is 66.1 percent. There is a significant difference in the literacy rate of male and female population. Out of the total population, male literacy rate is 79.2 percent, whereas the female literacy rate is 52.1 percent, which is much lower than the male literacy rate and this difference has been wider among the SC and ST population.

## 3. Objective of the Study

Present research paper has been designed to understand the spatio-temporal variation in sex ratio and the growth of male and female population at district level in Rajasthan, with the following objectives.

- 1) To discuss and examine the trends of growth in male and female population and sex ratio in Rajasthan and compare it with national growth of male and female population and sex ratio.
- 2) To study the district wise variation in growth of male and female population as well as their temporal changes.
- 3) To study the district wise variation in sex ratio as well as their temporal change.
- 4) To analyze various reasons behind this spatio-temporal changes in growth of male and female population as well as sex ratio.

## 4. Database and Methodology

The present paper depicts the spatio-temporal variation in growth of male and female population and sex ratio at district level in the census year 2001 and 2011 and trends of male female population growth and sex ratio of Rajasthan as well as its comparison with national growth of male and female population and sex ratio, from 1951 to 2011. Therefore, the present paper is mainly based on secondary source of data in published form. The data are collected from census records of Government of India as well as office of Registrar General and Census Commissioner of India, District Census Handbook of different districts of Rajasthan. Present study covers 33 districts of Rajasthan, therefore, for purposeful study of the collected data from different sources, have been tabulated, computed and analyzed with the help of simple percentage method. Different cartographic methods like line graph and choropleth maps have been applied for the comparative study of the statistical data.

### Trends of male and female population growth and sex ratio in India and Rajasthan

The sex ratio of India and Rajasthan has been declining continuously, in spite of the fact that Rajasthan has made an improvement from 905 females per thousand male in 1901 to 928 females per thousand male in 2011, but it is far away from the national average sex ratio, and equality between male and female. First census conducted in 19<sup>th</sup> century reflected the masculinity of population composition. Low sex ratio right from 1901 till now, both in India and Rajasthan may be attributed to the fact that there has been higher female mortality, especially during childhood, than male. It has been observed that girls receives less medical care as compared to boys. When girls fall sick, they are neglected as well as female infanticide is also responsible for the disadvantage in girl child survival. Apart from this, there has been a selective discrimination against girls by birth.

India second most populous country in the world after China and the total population of India was 1210854977 in 2011. During 1901 to 1911 there has been an increase of 5.75 percent in the total population of India, but 1911 to 1921, recorded a negative growth in population (-0.31 percent).

The decrease in population during this period may be attributed to the occurrence of famines, plague, malaria and influenza alone caused death of 140 lakh people in the country in 1918. From 1921 to 1951, the rate of growth of population remained moderate and may be irregular, because 1931 recorded a growth of 11 percent, which increased to 14.22 percent in 1941, but 1951 registered a growth of 13.31 percent, with a decline of 0.91 percentage point.

It is very important to mention here, that Rajasthan, which was earlier known as Rajputana, got its recognition and

name as Rajasthan on March 30, 1949, when it was formed with the unification of Kota, Tonk, Shahpur, Pratapgarh, Kishangarh, Jhalawar, Dungarpur, Bundi, Banswara, Jaipur, Bikaner and Jodhpur.

Therefore, after the formation of Rajasthan in 1949, total population of Rajasthan was 15970774 persons in 1951, with a percentage growth rate of 15.20 percent. The year 1951 is also known as year of population explosion. During 1941-51 India registered a

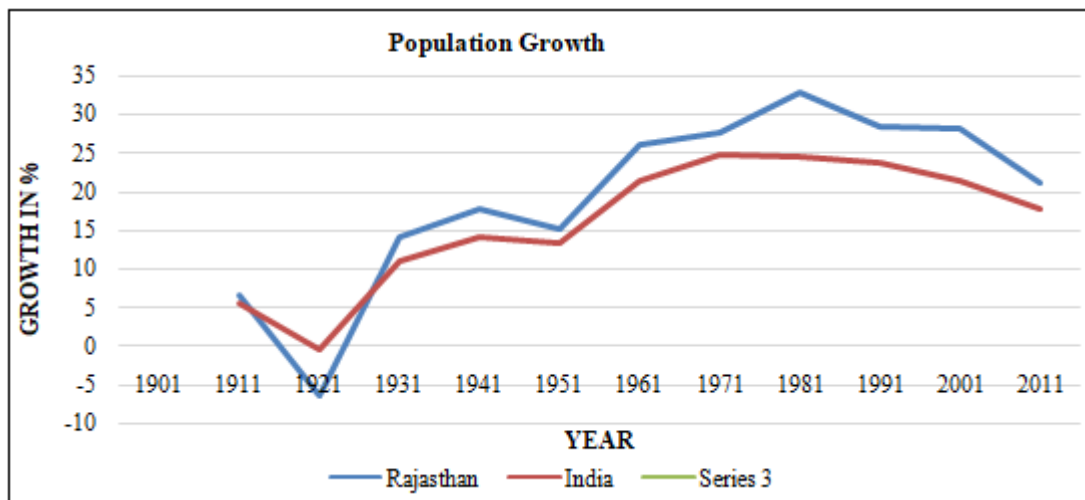
Trends of male and female population growth and sex ratio

Year	Rajasthan						India						
	Persons	% Growth	Male	% Growth	Female	Sex Ratio	Persons	% Growth	Male	% Growth	Female	% Growth	Sex Ratio
1901	10,294,090		5403989		4890101	905	238,396,327		120791301		117358672		972
1911	10,983,509	+6.70	5756206	7	5227303	7	252,093,390	+5.75	128385368	6	123708022	5	964
1921	10,292,648	-6.29	5429378	-6	4863270	-7	251,321,213	-0.31	128546225	0.13	122774988	-1	955
1931	11,747,974	+14.14	6160610	13	5587364	15	278,977,238	+11.00	142929689	11	135788921	11	950
1941	13,863,859	+18.01	7274679	18	6589180	18	318,660,580	+14.22	163685302	15	154690267	14	945
1951	15,970,774	+15.20	8313883	14	7656891	16	361,088,090	+13.31	185528462	13	175559628	13	946
1961	20,155,602	+26.20	10564082	27	9591520	25	439,234,771	+21.51	226293201	22	212941570	21	941
1971	25,765,806	+27.83	13484383	28	12281423	28	548,159,652	+24.80	284049276	26	264110376	24	930
1981	34,261,862	+32.97	17854154	32	16407708	34	683,329,097	+24.66	353374460	24	329954637	25	934
1991	44,005,990	+28.44	23042780	29	20963210	28	846,421,039	+23.87	439358440	24	407062599	23	926
2001	56,507,188	+28.41	29420011	28	27087177	29	1,028,737,436	+21.54	532223090	21	496514346	22	933
2011	68,548,437	+21.31	35550997	21	32997440	22	1,210,854,977	+17.70	623270258	17	587584719	18	943

Source: Census Reports

growth of 13.31 percent, but contributed an increase of 42427510 persons. Since the formation of Rajasthan in 1949, there has been a continuous increase of population till 1981, with a percentage growth of 32.97 percent, but, 1991

registered a decline in growth rate with a percentage growth of 28.44 percent, whereas 2001 recorded a growth of 28.41



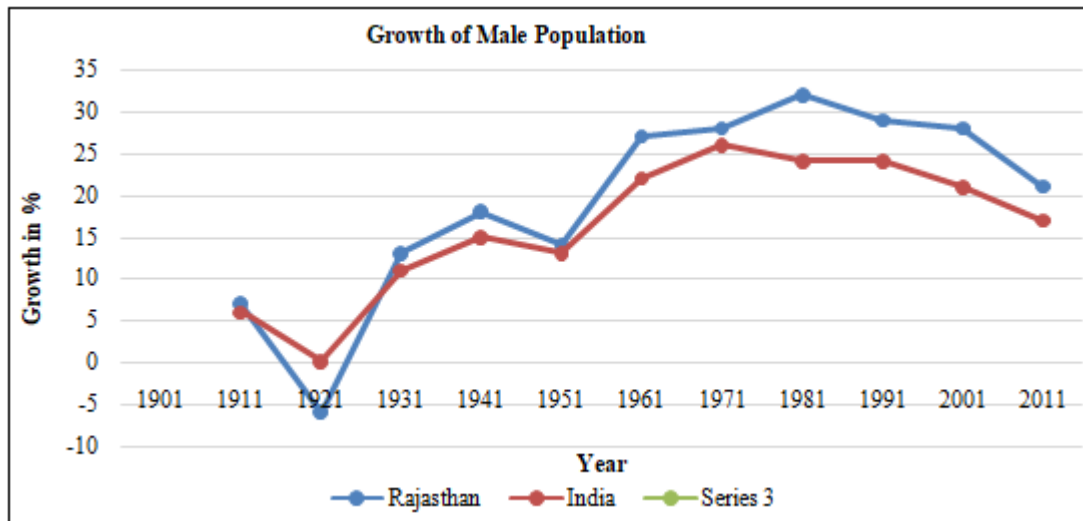
percent and census year 2011 recorded a percentage growth of 21.31 percent. It is interesting to note that the population growth rate always remained higher in Rajasthan, since its formation in 1949, as compared to national average growth rate. Census year 2011, recorded a population growth of 17.70 percent as a national average growth, but Rajasthan recorded a growth of 21.31 percent, with an increase of 3.61 percentage points.

This tremendous rise in population during the last sixty years may be attributed to the fall in death rate, due to

improvement in medical facilities, but the birth rate did not fall, Population in India as well as Rajasthan in growing at faster rate. If it is not stopped, population explosion will occur and the existing resource of the country will not be able to fulfill the needs of the people. The population growth and economic development of any region is linked. Both the state of Rajasthan and India have been a victim of population growth, but there has been a progress in the economic field too.

Growth rate of male and female population, both in India and state of Rajasthan shows a perceptible variation. In the state of Rajasthan, since 1951 to 2011, the highest growth rate in male population has been recorded in the census year 1981 with a percentage growth of 32 percent. It has also

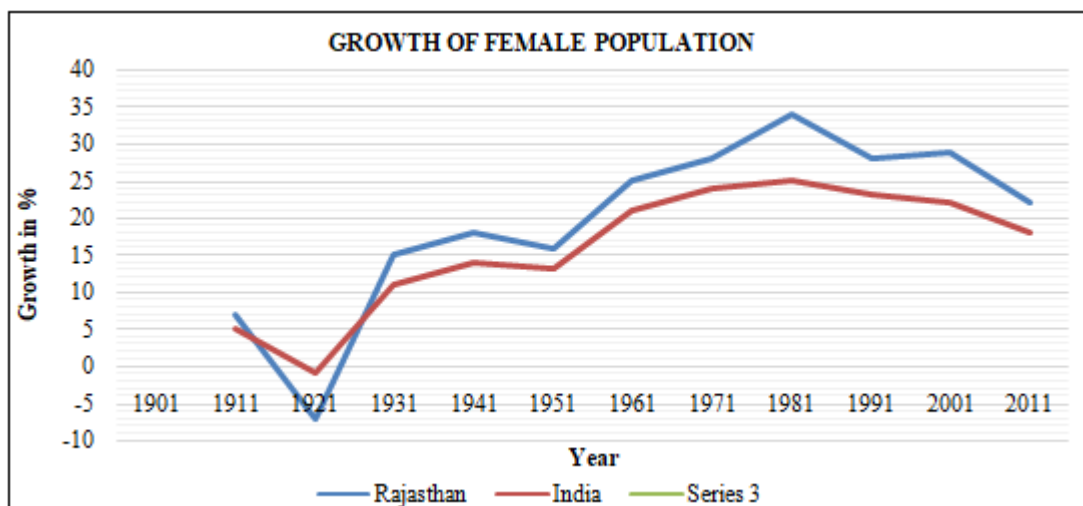
been observed that since 1951 till 1981, there has been a continuous increase in the growth rate of male population from 14 percent in 1951 to 32 percent in 1981. Similarly the highest growth rate in female population has



been observed in the same year of 1981, with a percentage growth of 34 percent, which is 2 percentage points higher than the percentage growth in male population (32 percent). Female population growth also recorded an increasing trend in percentage growth rate of 16 percent in 1951 to 34 percent in 1981. From 1981 to 2011, percentage growth in both male and female population in Rajasthan recorded a decreasing trend. According to the census year 1991 male population recorded a growth of 29 percent, whereas, in 2001, it was 28 percent, and 2011, recorded a sharp decline from 28 percent in 2001 to 21 percent. Similarly, as far as the growth rate of female population in Rajasthan is concerned it always remained higher than the male growth rate, since 1951 to 2011, except the year 1961 and 1991,

whereas, 1971, recorded a similar growth rate of 28 percent, both in male and female population. According to the census year 2011, Rajasthan recorded a male population growth of 21 percent, whereas, female population recorded a growth of 22 percent, which is 1 percentage point higher than the male growth rate.

If we go through the growth of male and female population in India, since 1951, we find that the highest male growth rate has been observed in the census year 1971, with a growth rate of 26 percent, whereas, the highest female growth rate has been observed in the census year 1981, with a growth rate of 25 percent. There has been a continuous

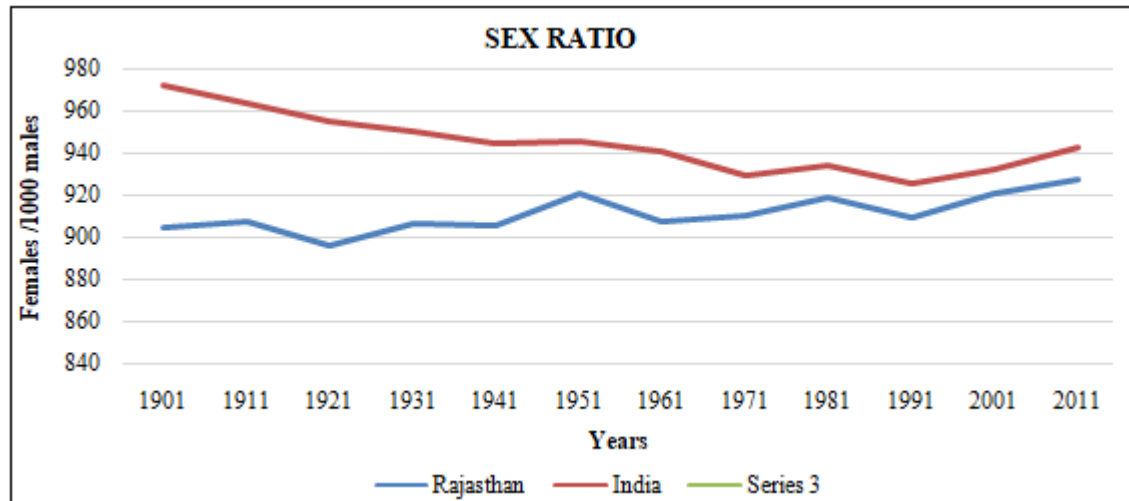


increase in the percentage growth of male population from 13 percent in 1951 to 26 percent in 1971, but female population recorded a continuous percentage growth of 13 percent in 1951 to 25 percent in 1981. Census year 1981 and 1991, recorded a same percentage of male population growth of 24 percent, whereas, in 2001, it was 21 percent

and 2011 recorded a growth of 17 percent which is 1 percentage point lower than the female growth rate of 18 percent. If we go through the male and female growth rate both in India and Rajasthan, since 1951, we find that female normally recorded a higher growth rate except in few census year. Even census year 2011 recorded the higher female

growth rate both in India and Rajasthan with 1 percentage point. Apart from this both in India and Rajasthan, growth rate has been slowing down for the past few decades. This decline in population growth rate both at national level and Rajasthan may be attributed to increasing alleviation of poverty, rising literacy, especially among women and the growing urbanization. Above all fertility rate has been declined to an average of 2.2 in 2017, according to a government survey in 22 major states, while urban fertility has already fallen below replacement level to 1.7 children per woman (why India is making progress in showing its

population growth; Vaishnavi Chandrashekar, Dec. 12, 2019). For fruitful demographic analysis, sex composition is extremely important, because changes in sex ratio largely reflects the underlying socio-economic and cultural characteristics of the society. Apart from this sex ratio is an important social indicator to measure the equality between male and female in any region. Since the census data regarding sex ratio is not regular, and Rajasthan was formed in the year 1949, therefore, a detailed account of sex ratio will be given from the census year 1951.



According to 2011 census report, India with a sex ratio 943 females per thousand males recorded lowest among the neighboring countries, like Bangladesh (978), Sri Lanka (1034) and Nepal (1014) except China, and fares worst in South Asia. If we go through the sex ratio of India from 1951 to 2011, we find that the sex ratio varies between 946 females per thousand males in 1951 to 943 females per thousand male in 2011. Similarly sex ratio in Rajasthan varies from 921 females per thousand males in 1951 to 928 females per thousand male. Therefore, we can say that the sex ratio never remained favourable to women both in the state of Rajasthan as well as India as a whole. Rajasthan recorded the highest sex ratio in the census year 2011, with a sex ratio of 928 females per thousand male, which is 15 points lower than the national average sex ratio of 943 females per thousand male. If we go through the sex ratio of Rajasthan we find that it has been continuously increasing from 908 in 1961 to 928 in 2011, except the year 1991, when the sex ratio declined to 910 females per thousand male from 919 females per thousand male in 1981, which registered a decline of 9 points. One of the striking feature is that the sex ratio always remained low in Rajasthan as compared to India as a whole from 1951 to 2011. Low sex ratio in the state may be a pointer to rampant foeticide. In western part of Rajasthan where girls are unwanted, female foeticide is on rampant practice. There is a practice of breaking a pot, when a girl child is born, which signifies sorrow to have a girl child. There are few districts, like Jaisalmer, Barmer, Ganganagar, Jhunjhunu, Pali and Chittaurgarh, which are known for killing of girl child, even there are villages with negligible presence of girl child. Apart from this son preference is the most important factor of low sex ratio in Rajasthan. Dowry is also an important reason behind not wanting a daughter. Apart from this

mushrooming of ultrasound clinics and the ability to pay for abortions has become one of the important reason for low sex ratio in Rajasthan.

If we go through the sex ratio in India we find that the highest sex ratio has been observed in the census year 1951, with a sex ratio 946 females per thousand male, whereas, the lowest sex ratio has been observed in the census year 1991, with a sex ratio of 926 females per thousand males, which is 8 point less than the previous census year of 1981, with a sex ratio of 934 females per thousand male. From the census year 2001, with a sex ratio of 933 females shows an upward trend and it reaches to 943 females per thousand male in 2011, with an increase of 10 points. Which reveals that India is capable of both creating and sustaining an attitude towards higher sex ratio. Since last five decades the sex ratio has been moving around 930 females per thousand males. But there is an urgent need of action to be taken to increase the sex ratio. Beti Bachao Beti Padhao is one step in this direction, which has been launched in 2015.

Apart from this female education and economic prosperity will help to improve the sex ratio. Government action can be supplemented by improving women's status in the society, so that son preferences can be reduced resulting from gender biased sex selection. Above all, to bring normal sex ratio, it is necessary that government, through all efforts should reach the young people, because they can accelerate the progress towards normal sex ratio.

#### District wise variation in growth of male and female population (2001-2011)

The rapid rate of growth of both male and female population in Rajasthan during 2001 to 2011, has become a problem of

grave concern today. Therefore, the reason and effects of the growth of male and female population have been carefully analyzed separately. Rajasthan the largest and 8<sup>th</sup> most populous among all the states of India, is currently going through the second phase of demographic transition and

slowly moving towards the third phase, but the population growth will remain continue. Rajasthan has made, a lot of efforts to improve the quality of life of its people through improvement in healthcare and sanitation facilities.

#### District Wise Growth of Male and Female population and Sex Ratio

Districts	Growth of Male Population			Growth of Female Population			Sex Ratio		Change in sex ratio
	2001	2011	% Growth	2001	2011	% Growth	2001	2011	
RAJASTHAN	29,420,011	35,550,997	21	27,087,177	32,997,440	22	921	928	7
Ganganagar	955378	1043340	9	834,045	925,828	11	873	887	14
Hanumangarh	801,486	931,184	16	716,519	843,508	18	894	906	12
Bikaner	1,003,035	1,240,801	24	899,075	1,123,136	25	896	905	9
Churu	870,821	1,051,446	21	825,218	988,101	20	948	940	-8
Jhunjhunun	983,526	1,095,896	11	930,163	1,041,149	12	946	950	4
Alwar	1,586,201	1,939,026	22	1,405,351	1,735,153	23	886	895	9
Bharatpur	1,132,857	1,355,726	20	967,163	1,192,736	23	854	880	26
Dhaulpur	538,103	653,647	21	445,155	552,869	24	827	846	19
Karauli	649,992	783,639	21	555,896	674,609	21	855	861	6
Sawai Madhopur	591,307	704,031	19	525,750	631,520	20	889	897	8
Dausa	696,563	857,787	23	626,439	776,622	24	899	905	6
Jaipur	2,768,203	3,468,507	25	2,482,868	3,157,671	27	897	910	13
Sikar	1,172,753	1,374,990	17	1,115,035	1,302,343	17	951	947	-4
Nagaur	1,424,967	1,696,325	19	1,350,091	1,611,418	19	947	950	2
Jodhpur	1,513,890	1,923,928	27	1,372,615	1,763,237	28	907	916	10
Jaisalmer	279,101	361,708	30	229,146	308,211	35	821	852	31
Barmer	1,038,247	1,369,022	32	926,588	1,234,729	33	892	902	9
Jalor	737,880	936,634	27	711,060	892,096	25	964	952	-12
Sirohi	437,949	534,231	22	413,158	502,115	22	943	940	-3
Pali	918,856	1,025,422	12	901,395	1,012,151	12	981	987	6
Ajmer	1,128,276	1,324,085	17	1,050,171	1,258,967	20	931	951	20
Tonk	626,436	728,136	16	585,235	693,190	18	934	952	18
Bundi	504,818	577,160	14	457,802	533,746	17	907	925	18
Bhilwara	1,030,237	1,220,736	18	990,732	1,187,787	20	962	973	11
Rajsamand	491,258	581,339	18	491,265	575,258	17	1000	990	-10
Dungarpur	547,791	696,532	27	559,852	692,020	24	1022	994	-28
Banswara	719,581	907,754	26	701,020	889,731	27	974	980	6
Chittaurgarh	676,565	783,171	16	653,795	761,167	16	966	972	6
Kota	827,222	1,021,161	23	741,483	929,853	25	896	911	14
Baran	535,043	633,945	18	486,430	588,810	21	909	929	20
Jhalawar	612,804	725,143	18	567,519	685,986	21	926	946	20
Udaipur	1,259,864	1,566,801	24	1,221,337	1,501,619	23	969	958	-11
Pratapgarh	359,001	437,744	22	347,806	430,104	24	969	983	14

Source: Census Reports

If we compare the data of growth of male and female population during 2001 and 2011, we find that female population recorded higher growth in almost all the districts except few districts like Churu, Rajsamand, Dungarpur and Udaipur. Rajasthan as a whole recorded 22 percent growth in female population which is 1 percentage point higher than the male growth rate of 21 percent.

If we go through the percentage growth in male population, we find that there are fourteen districts, namely Bikaner (24), Alwar (22), Dausa (23), Jaipur (25), Jodhpur (27), Jaisalmer (30), Barmer (32), Jalor (27), Sirohi (22), Dungarpur (27), Banswara (26), Kota (23), Udaipur (24) and Pratapgarh (22), recorded male growth rate higher than the state average male growth rate of 21 percent. Apart from this, there are three districts, named as Churu, Dhaulpur and Karauli, recorded the same growth rate of 21 percent as it has been observed by state as a whole. Out of the 33 districts of Rajasthan, the highest growth rate in male population has been recorded by Barmer with a growth rate of 32 percent,

which is followed by Jaisalmer (30 percent), whereas, 27 percent growth rate in male population has been observed by three districts, namely Jodhpur, Jalor and Dungarpur. Apart from this the lowest growth rate in male population during this period has been observed by Sri Ganganagar with a growth rate of only 9 percent, which is 12 percentage points lower than the state average (21percent) and 32 percentage points lower than the highest growth rate of 32 percent observed by Barmer.

If we divide all the 33 districts of Rajasthan into Low (Below 10 percent), Moderate (10.1 to 20 percent), High (20.1 to 30 percent) and Very High (Above 30 percent) of male population growth, we find that there is only one district, named as Ganganagar (9 percent), which can be categorized under low growth of male population below 10 percent, whereas, there are fifteen districts, named as, Hanumangarh, Jhunjhunun, Bharatpur, Sawai Madhopur, Sikar, Nagaur, Pali, Ajmer, Tonk, Bundi, Bhilwara, Rajsamand, Chittaurgarh, Baran and Jhalawar, recorded

male population growth of moderate level between 10.1 to 20 percent. Apart from the above mentioned sixteen districts, there are sixteen other districts named as Bikaner, Churu, Alwar, Dhaulpur, Karauli, Dausa, Jaipur, Jodhpur, Jaisalmer, Jalor, Sirohi, Dungarpur, Banswara, Kota, Udaipur and Pratapgarh, which can be categorized under high level of growth in male population between 20.1 to 30 percent, whereas, only one district named as Barmer, can be categorized under very high level of male population growth above 30 percent.

If go through the growth in female population during this period, we find that the state average growth rate of female population is 22 percent which is 1 percentage point higher than the male growth rate, and there are fifteen districts,

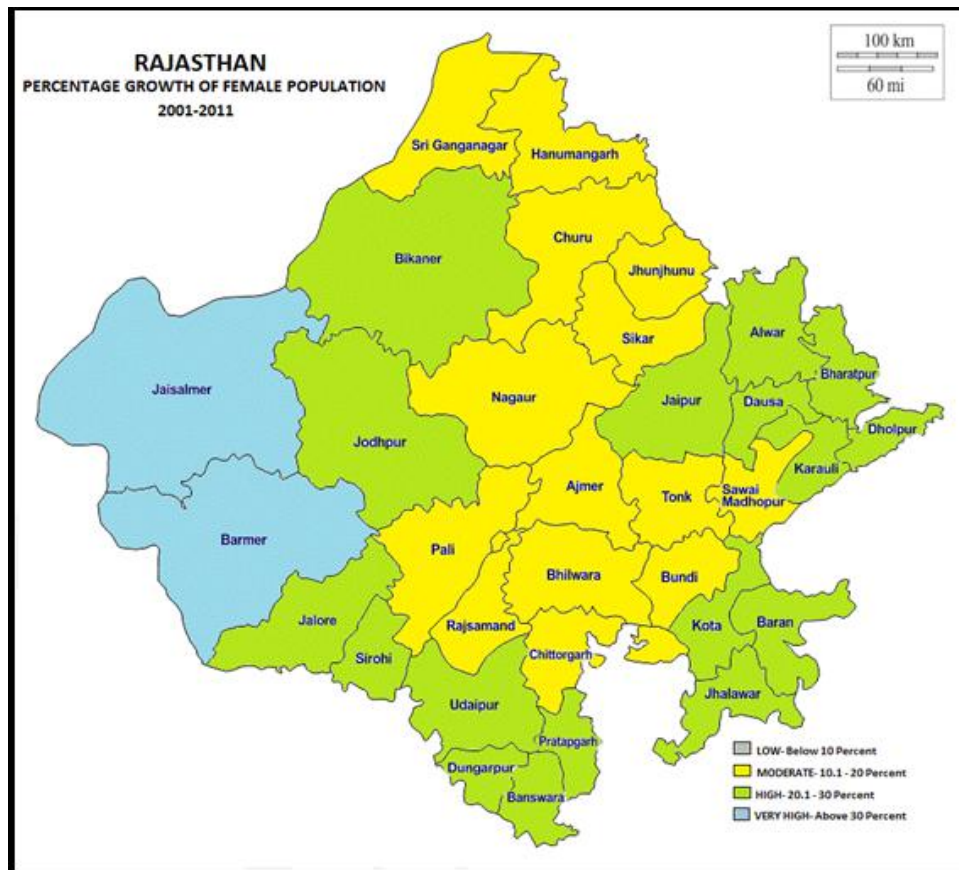
named as Bikaner (25), Alwar (23), Bharatpur (23), Dhaulpur (24), Dausa (24), Jaipur (27), Jodhpur (28), Jaisalmer (35), Barmer (33), Jalor (25), Dungarpur (24), Banswara (27), Kota (25), Udaipur (23), Pratapgarh (24), recorded female growth rate higher than the average female growth rate in Rajasthan (22 percent). Out of 33 district of Rajasthan, Jaisalmer recorded the highest female growth rate of 35 percent, which is followed by Barmer (33 percent), Jodhpur (28 percent) and Jaipur (27 percent), whereas, the lowest growth rate has been observed by Ganganagar (11 percent). It is also surprising that out of 33 districts of Rajasthan twenty three districts recorded female growth rate higher than the male growth rate, whereas, six districts recorded the same growth rate, like male during this



period (2001-2011). Apart from these 29 districts, there are only four districts, named as, Churu, Jalor, Dungarpur and Udaipur, which recorded female growth rate lower than the male growth rate.

Taking the same criteria as it has been adopted to categorize all the 33 districts of Rajasthan into Low (Below 10 percent), Moderate (10.1 to 20 percent), High (20.1 to 30 percent) and Very High (Above 30 percent) for the growth of male population, we can also categorize all the districts of Rajasthan into low, moderate, high and very high female growth rate. According to above mentioned categorization,

none of the district can be categorized under low growth rate, whereas, there are fourteen districts, named as, Ganganagar, Hanumangarh, Churu, Jhunjhunu, Sawai Madhopur, Sikar, Nagaur, Pali, Ajmer, Tonk, Bundi, Bhilwara, Rajsamand and Chittaurgarh, which can be categorized under moderate level of female growth rate between 10.1 to 20 percent. Apart from these fourteen districts, there are seventeen districts, namely, Bikaner, Alwar, Bharatpur, Dhaulpur, Karauli, Dausa, Jaipur, Jodhpur, Jalor, Sirohi, Dungarpur, Banswara, Kota,



Baran, Jhalawar, Udaipur and Pratapgarh, can be categorized under high level of female population growth rate between 20.1 to 30 percent, whereas, only two districts, named as Jaisalmer (35) and Barmer (33) can be categorized under very high growth of female population.

The higher growth rate in female population during 2001-2011, may be attributed to several factors like literacy rate, which has continuously witnessed an upward trend from 1951 to 2011. The literacy rate in Rajasthan was just 8.50 percent in 1951, raised to 66.10 percent in 2011. Similarly female literacy rate also increased from 2.66 percent in 1951 to 52.10 percent in 2011. Apart from literacy rate, urbanization in Rajasthan is also increasing at similar pace as it has been observed at national level. The percentage of share of urban population in Rajasthan has increased from 16.28 percent in 1961 to 23.39 percent in 2001 and later on in 2011, it was 24.87 percent. In 2011, among the urban population, the share of urban male population was 52.26 percent, whereas, the share of urban female population was 47.74 percent. Apart from this improvement in maternal mortality due to improved health facilities and awareness toward the importance of girl child in the society may be the other reasons for higher growth rate in female population.

#### District Wise Variation in Sex Ratio (2001-2011)

Sex ratio indicates the relative survival of females and males, and is among the most important demographic attributes. Sex ratio also helps in understanding the future breeding potential of population and is affected by birth, death, immigration and emigration rates. Sex ratio is the number of females per thousand males, therefore, it is extremely vital for any demographic study, as it reflects the socio-economic and cultural characteristic of any area. The

skewed sex ratio in Rajasthan is indeed unfortunate and alarming. Sadly there has been a continuous decline of sex ratio in Rajasthan since its formation in 1949. In 1951, Rajasthan recorded a sex ratio of 921 females per thousand males, which declined to 908 in 1961. Census year 1971 recorded an improvement of 3 points, with a sex ratio of 911 females per thousand male and 919 in 1981. Sex ratio again declined to 910 in 1991, but from last two decades there has been a continuous improvement in sex ratio from 921 in 2001 to 928 in 2011.

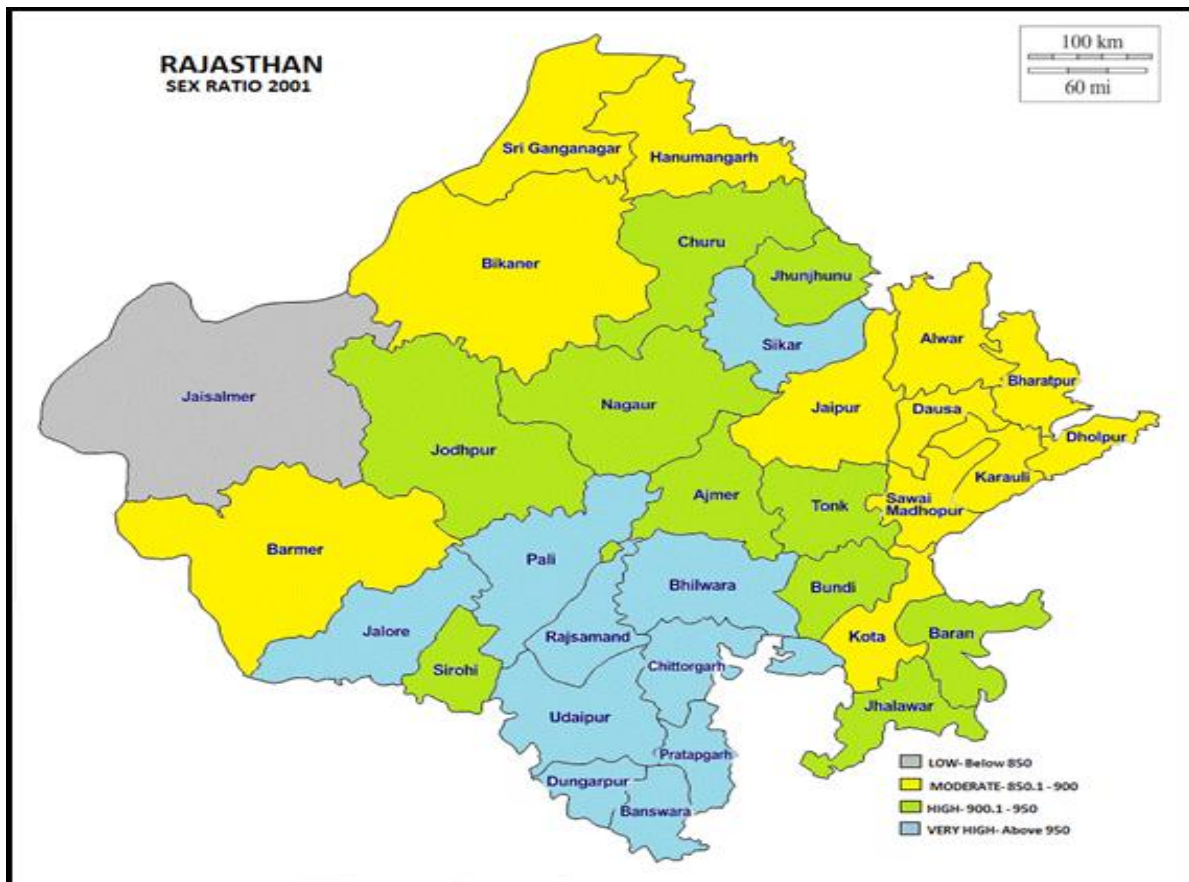
Census year 2001, helps us to take a respite from the gloomy data of declining sex ratio in Rajasthan since 1951 except the census year 1971 and 1981. According to census report of 2001, Rajasthan recorded a sex ratio of 921 females per thousand males, which is 11 points higher than the sex ratio in 1991. According to 2001 census report, out of 33 districts of Rajasthan, seventeen districts, recorded sex ratio higher than the previous decade 1991 (910 females thousand males). In the census year 2001, sex ratio remained unfavourable among all the districts of Rajasthan, except two districts, named as, Rajsamand with a sex ratio of 1000 females per thousand males and Dungarpur with a sex ratio of 1022 females per thousand males. Among all the 33 districts, there are seventeen districts, named as Churu (948), Jhunjhunu (946), Sikar (951), Nagaur (947), Jalor (964), Sirohi (943), Pali (981), Ajmer (931), Tonk (934), Bhilwara (962), Rajsamand (1000), Dungarpur (1022), Banswara (973), Chittaurgarh (966), Jhalawar (926), Udaipur (970) and Pratapgarh (969), recorded sex ratio higher than the state average sex ratio of 921 females per thousand males. It is also a good sign that all above mentioned seventeen districts also recorded sex ratio higher than the national average sex ratio of 933 females per thousand males in



2001, except Jhalawar, which recorded a sex ratio of 926 females per thousand males, which is lower than the national average sex ratio (933). Dungarpur with sex ratio 1022 females per thousand males recorded the highest sex ratio which is followed by Rajsamand (1000), Pali (981) and Banswara (973), whereas, the lowest sex ratio has been observed by Jaisalmer. This lowest sex ratio in Jaisalmer may be attributed to skewed sex ratio. It is a belt for killing its daughter with the worst statistics of female infanticide. According to India Today report by Preeti Chaudhary, in Jaisalmer women are kept in veils and daughter are buried deep inside grave.

If we categorize all the 33 districts of Rajasthan into Low (Below 850), Moderate (850.1 to 900), High (900.1 to 950), Very High (Above 950), sex ratio, we can find that there is only one district, named as Jaisalmer, which can be categorized under low level of sex ratio, whereas, there are twelve districts, namely, Ganganagar, Hanumangarh, Bikaner, Alwar, Bharatpur, Dhaulpur, Karauli, Sawai Madhopur, Dausa, Jaipur, Barmer and Kota, which can be categorized under moderate level of sex ratio between 850.1 to 900 females per thousand males. Apart from these thirteen districts, there are ten districts, named as Churu, Jhunjhunu, Nagaur, Jodhpur, Sikar, Ajmer, Tonk, Bundi, Baran and Jhalawar, which can be categorized under high level of sex ratio between 900.1 to 950 females per thousand males, whereas, ten districts, named as Sikar, Jalor, Pali, Bhilwara, Rajsamand, Dungarpur, Banswara, Chittaurgarh, Udaipur and Pratapgarh can be categorized under very high level of sex ratio above 950 females per thousand males.

According to census report of 2011, Rajasthan recorded a sex ratio of 928 females per thousand males which is 7 points higher than the previous census year of 2001, whereas, it is 15 points lower than the national average sex ratio of 943 females per thousand male. The district level sex ratio data in the year 2011, is somewhat encouraging, because out of 33 districts, eighteen districts, named as Churu (940), Jhunjhunu (950), Sikar (947), Nagaur (950), Jalor (952), Sirohi (940), Pali (987), Ajmer (951), Tonk (952), Bhilwara (973), Rajsamand (990), Dungarpur (994), Banswara (980), Chittaurgarh (972), Baran (929), Jhalawar (946), Udaipur (958) and Pratapgarh (983), recorded sex ratio, higher than the state average sex ratio of 928 females per thousand male. According to 2011 census report, the highest sex ratio has been recorded by Dungarpur with a sex ratio of 994 females per thousand males, but there is a decline of 22 points from the previous decade. Dungarpur has been followed by Rajsamand with sex ratio 990 females per thousand males. Rajsamand has also recorded a decline of 10 points from the previous decade, but both these districts maintained the same position, as it was in the census year 2001. On the basis of the sex ratio, third position has been occupied by Pali with a sex ratio of 987 females per thousand male, which is followed by Pratapgarh (983) and Banswara (980), whereas, the lowest sex ratio has been observed by Dhaulpur, with a sex ratio of 846 females per thousand males, and the second lowest has been recorded by Jaisalmer, 852 females per thousand males, with an increase of 31 points from the previous census year 2001. It is very surprising that out of 33 districts fifteen districts, recorded sex ratio higher than the national average sex ratio, which reflects an encouraging trends towards favourable sex ratio.



Following the same criteria, as it has been adopted in the census year 2001, to categorize all the districts into Low (Below 850), Moderate (850.1 to 900), High (900.1 to 950) and Very High (Above 950), we can categorize only one district named as Dhaulpur, under low level of sex ratio, below 850 females per thousand males, whereas, six district namely, Ganganagar, Alwar, Bharatpur, Karauli, Sawai Madhopur and Jaisalmer, can be categorized under moderate level of sex ratio between 850.1 to 900 females per thousand males. There are fifteen districts named as, Hanumangarh,

Bikaner, Churu, Jhunjhunu,, Dausa, Jaipur, Sikar, Nagaur, Jodhpur, Barmer, Sirohi, Bundi, Kota, Baran and Jhalawar, which can be categorized under high level of sex ratio between 900.1 to 950 females per thousand males, whereas, there are eleven districts, namely, Jalor, Pali, Ajmer, Tonk, Bhilwara, Rajsamand, Dungarpur, Banswara, Chittaurgarh, Udaipur and Pratapgarh, can be categorized under very high level of sex ratio above 950 females per thousand males.



On the basis of above discussion we can say that improvement in sex ratio in the last two census year, 2001 and 2011, represents a good sign against female prejudice in the state of Rajasthan. This may be attributed to the multipronged strategy adopted by the government, both at state and center, to develop a positive environment by means of gender sensitive policies to protect girl child. This increase in sex ratio may also be attributed to the improvement in the status of women and better health facilities. Many interventions have been launched by the government under National Rural Health Mission to improve the sex ratio. Central government has advised to state government to find out the reasons behind low sex ratio. Women achievers and religious leaders are being involved to campaign against discrimination of girl child. Apart from this sex ratio may also has increased due to

outmigration of male labourers to adjacent state like Punjab, Haryana and Delhi, in search of better job opportunities. But, above all, the increase in literacy rate has played an important role in the improvement of sex ratio. The literacy rate in female has increased from 43.85 percent in 2001 to 52.10 percent. Therefore, we can say that higher female literacy would eventually lead better employability and will help to increase the sex ratio. This is the ripe time to change the mindset and attitude of the young people toward gender biasness. Government can also introduce gender based quotas in school, colleges and working places. Government can provide higher pensions to old age couples having only daughter, which may hopefully lead us towards more balanced sex ratio in the state of Rajasthan, as well as, nation as a whole.

## Comparison between Sex Ratio (2001-2011)

Category	Range	No. of Districts 2001	No. of Districts 2011	Name of the Districts	
				2001	2011
Low	Below 850	01	01	Jaisalmer	Dhaulpur
Moderate	850.1 to 900	12	6	Ganganagar, Hanumangarh, Bikaner, Alwar, Bharatpur, Dhaulpur, Karauli, Sawai Madhopur, Dausa, Jaipur, Barmer, Kota	Ganganagar, Alwar, Bharatpur, Karauli, Sawai Madhopur, Jaisalmer
High	900.1 to 950	10	15	Churu, Jhunjhunu, Nagaur, Jodhpur, Sirohi, Ajmer, Tonk, Bundi, Baran, Jhalawar	Hanumangarh, Bikaner, Churu, Jhunjhunu, Dausa, Jaipur, Sikar, Nagaur, Jodhpur, Barmer, Sirohi, Bundi, Kota, Baran, Jhalawar
Very high	Above 950	10	11	Sikar, Jalor, Pali, Bhilwara, Rajsamand, Dungarpur, Banswara, Chittaurgarh, Udaipur, Pratapgarh	Jalor, Pali, Ajmer, Tonk, Bhilwara, Rajsamand, Dungarpur, Banswara, Chittaurgarh, Udaipur, Pratapgarh

## 5. Conclusion

The growth rate of male and female population both in India and the state of Rajasthan shows a perceptible variation. In the state of Rajasthan, since 1951 to 2011, the highest growth rate in male population has been recorded in the census year 1981 with a percentage growth of 32 percent. It has also been observed that from 1951 to 1981, there has been a continuous increase in the growth rate of male population from 14 percent in 1951 to 32 percent in 1981. Similarly the highest growth rate in female population has also been observed in the same year of 1981, with a percentage growth of 34 percent, which is 2 percentage points higher than the percentage growth in male population (32 percent). Female population also recorded an increasing trend in percentage growth rate of 16 percent in 1951 to 34 percent in 1981. From 1981 to 2011, percentage growth in both male and female population in Rajasthan recorded a decreasing trend.

Apart from the growth rate of male and female population in Rajasthan, sex ratio is an important indicator to measure the equality between male and female population and socio-economic and cultural characteristics of the society. The sex ratio in Rajasthan varies from 921 females per thousand male in 1951 to 928 females per thousand male. Sex ratio never remained favorable to women in Rajasthan. Rajasthan recorded the highest sex ratio in the census year 2011, with a sex ratio of 928 females per thousand male, which is 15 points lower than the national average sex ratio of 943 females per thousand males. The sex ratio in Rajasthan has been continuously increasing from 908 in 1961 to 928 in 2011, except the year 1991, when the sex ratio decreased to 910 females per thousand male from 919 females per thousand males in 1981 which registered a decline of 9 points. One of the striking feature is that the sex ratio always remained low in Rajasthan as compared to India as a whole from 1951 to 2011. The census year 2001, helps us to take a respite from the gloomy data of declining sex ratio in Rajasthan and recorded a sex ratio of 921 females per thousand males which is 11 points higher than the sex ratio in 1991. In the census year 2001, sex ratio remained unfavorable among all the districts of Rajasthan, except two districts, named as Rajsamand with a sex ratio of 1000 females per thousand males and Dungarpur with a sex ratio of 1022 females per thousand males. Among all the 33 districts, there are seventeen districts, which recorded sex ratio higher than the state average sex ratio (921) as well as national average sex ratio of 933 females per thousand males

except Jhalawar. Jaisalmer recorded the lowest sex ratio among all the districts of Rajasthan, which may be attributed to killing of its daughter with worst statistics of female infanticide. The district level sex ratio data in the year 2011, is somewhat encouraging, because eighteen districts recorded sex ratio higher than the state average sex ratio of 928 females per thousand male. According to census year 2011, Dungarpur again recorded the highest sex ratio of 994 females per thousand males, but there is a decline of 22 points from the previous decade of 2001. The lowest sex ratio of 846 females per thousand males has been observed by Dhaulpur and the second lowest by Jaisalmer with a sex ratio of 852 females per thousand males. Out of 33 districts, fifteen districts, recorded sex ratio higher than the national average sex ratio of 943 females per thousand males. Low sex ratio in the state may be a pointer to rampant foeticide. In western part of Rajasthan, where girls are unwanted, female foeticide is on rampant practice. There are few districts, like Jaisalmer, Barmer, Ganganagar, Jhunjhunu, Pali and Chittaurgarh, which are known for killing of girl child, even there are villages with negligible presence of girl child. Apart from this son preference is the most important factor for low sex ratio as well as dowry is also an important reason behind not wanting a daughter. Improvement in sex ratio during last two census year 2001 and 2011 represents a good sign against female prejudice in the state of Rajasthan. This may be attributed to multipronged strategy adopted by the government to develop a positive environment by mean of gender sensitive policies to protect girl child. This increase in sex ratio may also be attributed to the improvement in the status of women and better health facilities especially by Rural Health Mission. Improvement in literacy rate has also played an important role in the improvement in sex ratio at state level because literacy and sex ratio have always been considered to be an important key for socio-economic growth.

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