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Research Article

SPATIO-TEMPORAL VARIATION IN SEX RATIO OF PUNE DISTRICT IN MAHARASHTRA

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ABSTRACT

The sex ratio is generally defined as the number of females per thousand males. Sex ratio is an index of socio-economic conditions, revealing in an area and is useful tool for regional analysis. The sex ratio is large variation from one district to another district in Maharashtra State. According to Census of the India, the general sex ratio in Maharashtra state has increased from 922 to 925, showing an incremental of three females per thousand males during 2001 to 2011. In the state, the child sex ratio in the Maharashtra has experienced a declining trend from 913 in 2001 to 894 in 2011. The present study reveals that the sex ratio of Pune District during 1981 - 2011. The study of Pune District has experienced a decrease in general sex ratio of 937 to 915 during 1981 to 2011. While the child sex ratio has declining from 950 in 1981 to 883 in 2011, due to son preference and neglect of the girl child resulting in higher mortality at younger age. The aim of the research work is to identifying spatio-temporal variation in sex ratio of Pune district with the help of decennial census report of the Government of India and investigates the current trends of sex ratio.

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INTRODUCTION

An understanding of the sex ratio of a population in the spatial context is one of the vital demographic characteristics of any region. Apart from itself being an important regional characteristic, sex ratio not only mirrors the socio-economic condition of an area but also reflects a stage in the historical development of population (Franklin, 1956). It has a strong bearing on birth and death rates, migration, size and composition of households and the occupational structure of any region (Hawley, 1959). Sex ratio is the most important demographic characteristics that reflect the status of women in society. It is defined as the ratio of females per 1000 male population (Dawn and Basu, 2015). It is a great source to find the equality of males and females in a society at a given period of time (Pednekar and Sita, 1980).

According to census of India 2011, the general sex ratio of India is 940. The sex ratio at the national level has risen by seven points during the period of 2001 to 2011 and it is the highest since 1971. The highest sex ratio of 1084 is recorded by Kerala state and the lowest sex ratio of 877 is recorded by Haryana state. The country has recorded negative child sex ratio in the age group 0-6, which has declined from 927 to 914 girls during the period of 2001 to 2011. The highest sex ratio of child population has been recorded in Mizoram state i.e. 971 and lowest is recorded in Haryana state i.e. 830 (Census of India, 2011). India suffers from a huge inequality of male

female child ratio resulting in a poor sex ratio in some part of country.

Sex ratio in Maharashtra has declined over the century from 978 in 1901 to 929 in 2011 (Barakade, 2012). The overall sex ratio in Maharashtra is 929 i.e. for per 1000 males, which is below national average of 940 as per census 2011. In 2001, the sex ratio of female was 922 per 1000 males in Maharashtra. There are three critical districts with sex ratio below 900 in 2011 viz. Mumbai (838), Mumbai Suburban (857) and Thane (880) districts. There are six districts, where the sex ratio is above 900 but less than 925. These are Pune (910), Bid (912), Aurangabad (917), Osmanabad (920), Jalgaon (922) and Latur (924) districts. However, the trend shows that the sex ratio in all these districts has decreased during 2001 to 2011 due to preference for son, low status of women, crude and unskillful midwifery under unhygienic conditions, lack of proper pre and post-natal care, social and financial security associated with sons etc. The child sex ratio in Maharashtra has declined from 950 girls in 1981 to 833 girls for every 1000 boys in 2011. Many studies have shown that the prenatal sex determination is the main reason of low sex ratio in Maharashtra followed by abortion of female fetuses. Gokhale Institute of Politics and Economics department, Pune established a correlation between the number of Sonography centres and declining child sex ratio in Maharashtra. The report revealed that around 78 percent of Sonography clinics are registered in the Western Maharashtra like Pune, Mumbai, Nashik, Sangli and Kolhapur districts (Mulay and Nagarajan, 2002). Therefore, present research work

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emphasizes on identifying spatio-temporal variation in sex ratio of Pune District in Maharashtra over a last four decades (1981-2011) using decennial census report of the Government of India. The research finding will have proper understanding of pattern and trend of sex ratio, overall sex ratio and level of child sex ratio is required for effective demographic planning and strategies.

Study Area

Pune district lies in the Western Ghats or Sahyadri mountain range and it extends on to the Deccan Plateau on the east. Pune stands on the leeward side of the Western Ghats. Pune District lies between latitudes 17° 54' N and 19° 24' N and longitudes between 73° 19' E and 75°10' E. Pune District occupies an area of 15642 sq. km, which is 5.10 per cent of the total geographical area of the state. Among the 36 districts of the state, Pune is the second largest district in terms of area. Out of 15021 sq. km area comes under rural and 621 sq. km comes under urban area. Pune is at an altitude of 560m. The landscape of Pune District is distributed triangularly in western Maharashtra at the foothills of the Sahyadri Mountains and is divided into three parts: Ghatmatha, Maval and Desh. Pune District is bound by Thane District on the northwest, Raigad District on the west, Satara District on south, Solapur District on the southeast and Ahmadnagar District on northeast (Mundhe and Jaybhaye, 2014).

According to Census of India 2011, Pune District had total population of 94.29 lakhs, which is share of 8.39 % of total Maharashtra population. Pune has a sex ratio of 915 females for every 1000 males and a literacy rate of 87.19%. In Pune district there are 2 Municipal corporations, 3 cantonment boards and 14 tahsils namely Ambegaon, Baramati, Bhore, Daund, Haveli, Pune City, Indapur, Junnar, Khed, Maval, Mulshi, Purandar, Shirur and Velhe (Figure 1).

Objectives of the Study

The study has been initiated to fulfill the following objectives are:

1. To identify and examine the spatio-temporal variation in sex ratio of Pune District from 1981-2011.
2. To study the factors responsible for variation in sex ratio with the variation of places.

MATERIALS AND METHODS

The present study is based on the primary and secondary data. Primary data have been generated through questionnaire based field survey meant for different target groups using purposive sampling method. Secondary data that have been collected from Census records published by the Government of India. The other sources have been used like District Census Handbook of Maharashtra and Pune District, District Statistical Abstract of Pune, Sample Registration System Bulletin, District Gazetteers District and concern information is collected from various published thesis, articles, books and journals etc. The SOI topographical maps used for demarcation of study area. The data thus collected will be processed, analyzed, interpreted and represented with the help of quantitative, cartographic and GIS techniques. Sex ratio is measured in terms of number of females per thousand males. The sex ratio is measured given the following formula (Das Gupta, 1987; Sen, 1992; Subramanian and Corsi, 2011).

$$\text{Sex Ratio} = \frac{\text{Female Population}}{\text{Male Population}} \times 1000$$

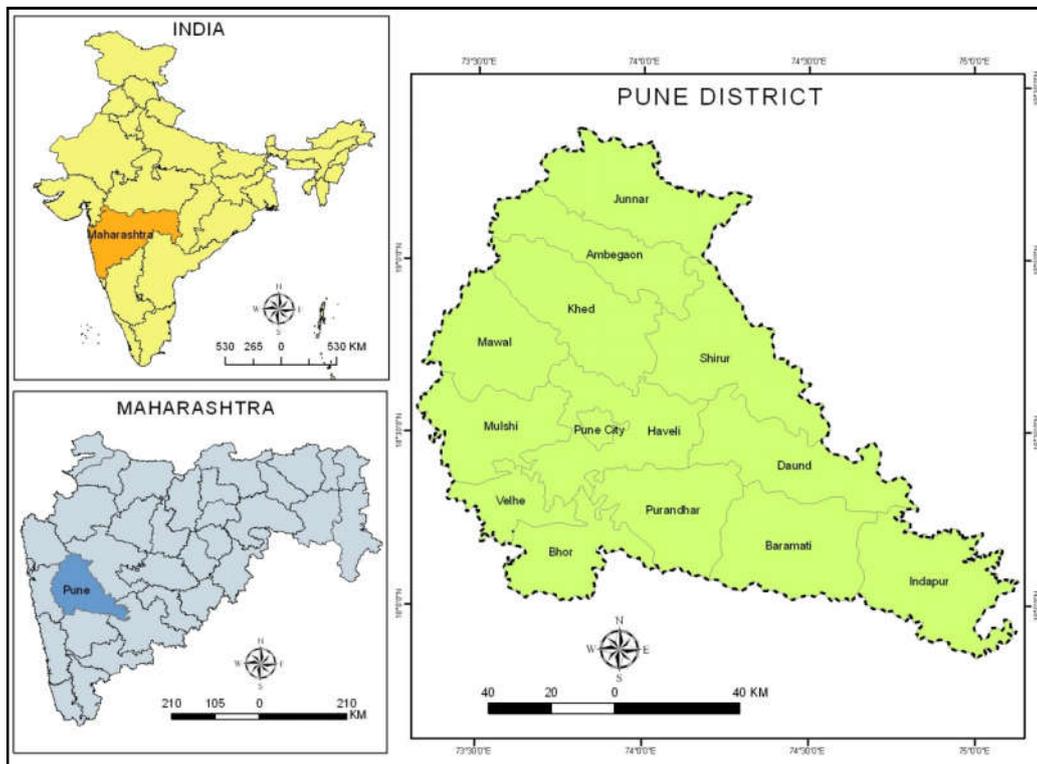


Figure 1 Location Map of Study Area

RESULTS AND DISCUSSION

Spatio - Temporal variation in Sex Ratio of Maharashtra

The general sex ratio of Maharashtra in 1901 was 978 females for every 1000 males. The state of Maharashtra has recorded an upward and downward general sex ratio with a declining child sex ratio. In 2001, the state has registered general sex ratio of 922, which has increase to 929 in 2011 (Table 1). As per 2011, Census of India, the highest sex ratio recorded such as Ratnagiri (1123), Sindhudurg (1037), Gondiya (996), Satara (986) and Bhandara (984) Districts. The lowest sex ratio in Mumbai City (838), Mumbai Suburban (857), Thane (880), Bid (912) and Pune (915) Districts. The child sex ratio of Maharashtra has declined from 913 in 2001 to 894 in 2011. The highest child sex ratio in Gadchiroli (961), Gondiya (956), Chandrapur (953), Bhandara (950) and Nundurbar (944) Districts were recorded. The lowest child sex ratio was observed in Bid (807), Jalgaon (842), Ahmadnagar (852), Buldhana (855) and Aurangabad (858) Districts of Maharashtra. The very low sex ratios observed in the large metropolitan areas like Mumbai, Mumbai Suburban, Thane and Pune Districts due to opportunities of better jobs and education and male migrants seeking job in private, government and other sector.

Table 1 Decadal Variation of Sex Ratio in Maharashtra and Pune District, 1981-2011

Year	General Sex Ratio		Child Sex Ratio (0-6 years age group)	
	Maharashtra	Pune District	Maharashtra	Pune District
1981	937	937	956	950
1991	934	933	946	943
2001	922	919	913	902
2011	929	915	883	833

Source: Census of India, 1981 - 2011

In the most recent census on 2011, the total population of the district was 9,426,959, making it the fourth most populous district in India (Pune District Wikipedia). In 1981, the general sex ratio in Pune District was 937, which was equal the state figure of 937. The next three decades, 1991-2011, recorded successive drop in sex ratio from 933 in 1991 to 915 in 2011. This period was characterized by large-scale male selective in-migration. The gap between Maharashtra state and Pune District sex ratio is higher in 2001 and 2011, which were negative 3 and 14 respectively. Thus, the negative difference increased gradually, it has reflected that the Pune District socio-economic and sex ratio situation is not so good.

In 1981, the child sex ratio of Pune District was 950, which was lower than the state figure of 956. In the most recent census on 2011, child sex ratio of Pune District was 833 only, indicating a decrease of 69 girls per 1,000 boys during the ten years period (Table 1).

Spatio - Temporal Variation in Sex Ratio of Pune District

Sex ratio is an indicator of the level of development of any region. Pune is considered as the dominant district in Western Maharashtra in the field of human development as well as trade and commerce. The Pune District has played a significant role in the Maharashtra socio-economic and political scenario since after independence. There are 14 tahsils in the Pune District. The level of human development in the district is highly

concentrated in around the Pune City, which is the cultural capital of the Maharashtra state. Pune District has been a female deficit area throughout the period of 1951 to 2011. Its average sex ratio has never been able to touch the mark of national average. Compared with figure of 937 in 1981, the 1991 census returned a sex ratio of 933 only, indicating a decrease of four females per 1000 males during the ten years. The next two decades, 1991 to 2011, recorded successive drop in general sex ratio from 933 in 1991 to 919 in 2001 and 915 in 2011 respectively (Table 2). There are not only variations in the level of general sex ratio in Pune district but also fluctuation in the decadal of sex ratio. Out of 14 tahsils, there were 3 tahsils in 1981, 1991 and 2001 and 4 tahsils in 2011 with a lower sex ratio than the district average. These included Haveli, Pune City, Maval and Khed Tahsils due to preference of son and neglecting female child resulting low sex ratio as compared to district average. For the last several decades, a significant decreasing tendency of sex ratio is concentrated in the various tahsils, namely Ambegaon, Bhore, Indapur, Junnar, Khed, Shirur and Velhe Tahsils (Figure 2).

Table 2 Level of General Sex Ratio by Tahsils, Pune District (1981-2011)

Sr. No.	District/Tahsils	Number of females per 1000 males			
		1981	1991	2001	2011
1	Ambegaon	1038	1011	987	979
2	Baramati	955	938	936	943
3	Bhor	1097	1039	1011	977
4	Daund	948	934	927	939
5	Haveli	874	883	865	850
6	Pune City	889	919	917	943
7	Indapur	940	933	930	927
8	Junnar	1041	1000	976	973
9	Khed	983	959	927	892
10	Maval	918	929	903	902
11	Mulshi	1019	984	921	899
12	Purandar	1038	990	958	965
13	Shirur	989	967	934	916
14	Velhe	1091	1038	1008	982
Pune District		937	933	919	915

Source: Census of India, 1981 - 2011

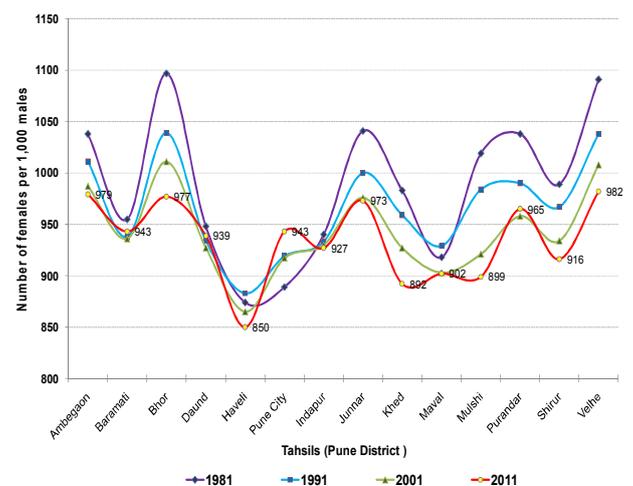


Figure 2 Decadal Variation in General Sex Ratio of Pune District, 1981-2011

In 1981, the tahsil-wise sex ratio of Pune District was highest in Mulshi, Purandhar, Bhor, Ambegaon, Junnar and Velhe Tahsils having sex ratio of more than 1000 and above in the

districts. In 2001, there were only two tahsils shows the dominance of the female population i.e. Bhor and Velhe Tahsils having sex ratio of more than 1000 and above. According to 2011, Census in Pune District there is no single tahsil having sex ratio of more than 1000 and above (Figure 2).

2. Areas of sex ratio with with 900 to 1000 females per 1000 males and,
3. Areas of sex ratio with less than 900 females per 1000 males,

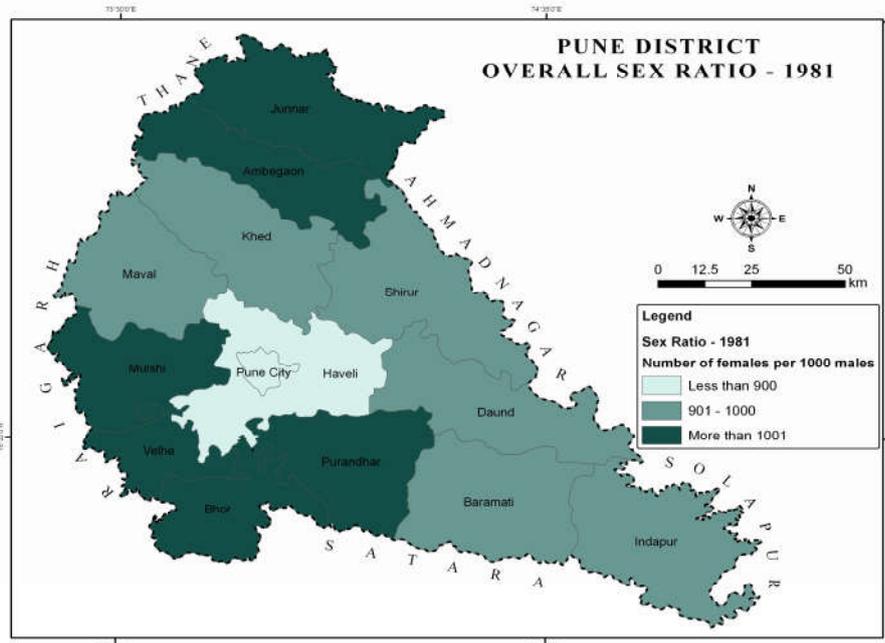


Figure 3 Patterns of Sex Ratio in Pune District, 1981

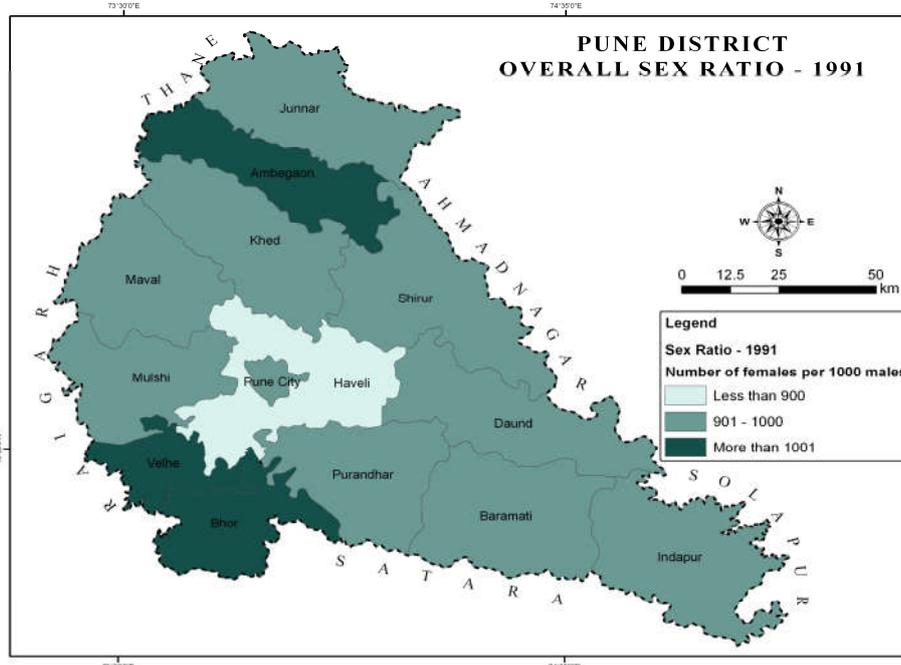


Figure 4 Patterns of Sex Ratio in Pune District, 1991

Spatial Patterns of Sex Ratio in Pune District (1981-2011)

The discussion that follows is based on a choropleth map dealing with sex ratio of Pune District. Spatial patterns of sex ratio for Pune District have been attempted temporally from 1981 to 2011. Three types of areas have been identified for the purpose of discussing general sex ratio as given below.

1. Areas of sex ratio with more than 1000 females per 1000 males,

Areas of Relatively High Sex Ratio

Having more than 1000 females for every 1000 males, this group of areas includes about 6 tahsils in 1981, namely Bhor (1097), Velhe (1091), Junnar (1041), Ambegaon (1038), Purandar (1038) and Mulshi (1019) tahsils due to outmigration to better agricultural areas of the nearby frontier tract. In 1991, there were 3 tahsils under this category i.e. Bhor (1039), Velhe (1038) and Ambegaon (1011) Tahsils, Junnar, Purandar and Mulshi Tahsils have subtracted in this category (Figure 4).

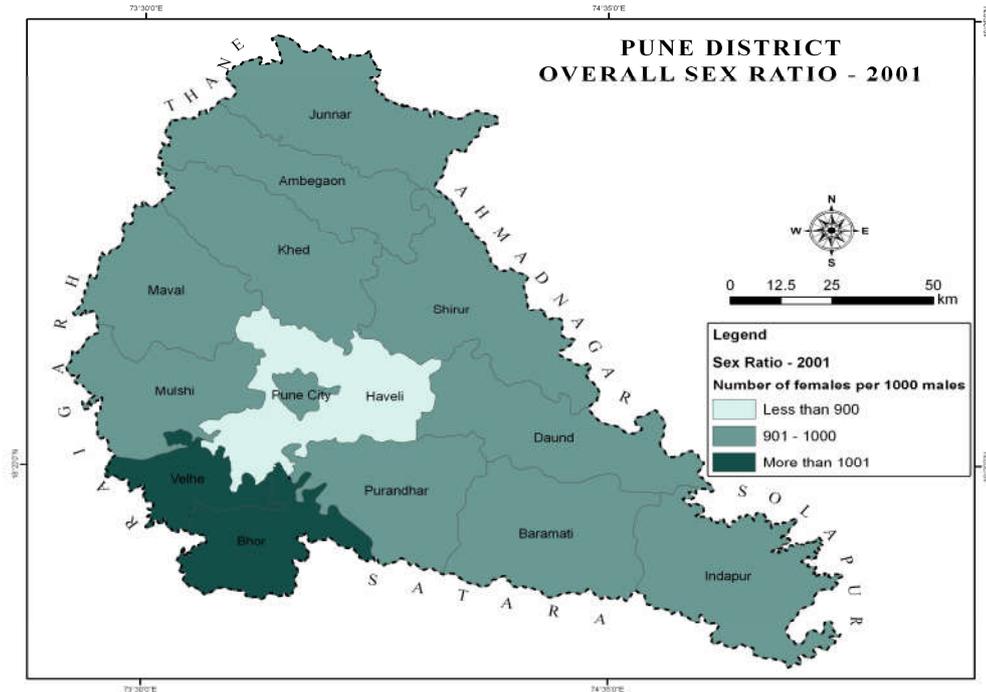


Figure 5 Patterns of Sex Ratio in Pune District, 2001

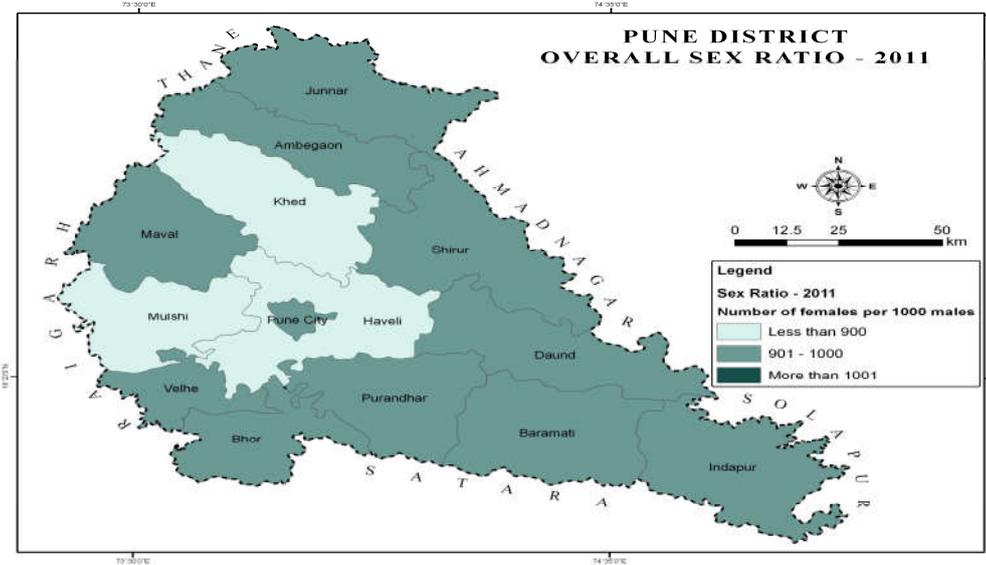


Figure 6 Patterns of Sex Ratio in Pune District, 2011

As per 2001, Census only two tahsils were remaining mention above such as Bhore (1011) and Velhe (1008) tahsils under this category. In 2011, Pune District there is no single tahsil having sex ratio of more than 1000 and above. It clearly shows that the trend of sex ratio in Pune District (tahsilwise) has decreased due to preponderance of male births and higher rate of female mortality etc.

Areas of Moderate Sex Ratio

In about 78 percent of the inhabited tahsil of the area, sex ratio ranges between 900 and 1000 against the district average of 915 in 2011. Moderate levels of sex ratio were found in 6 tahsils in 1981 i.e. Maval, Khed, Shirur, Daund, Baramati and Indapur Tahsil (Figure 3).

In 1991, there were added 4 tahsils such as Pune City, Mulshi, Purandar and Junnar in Pune District. According to 2001, Census of India, there were total 11 tahsils having sex ratio of 900 to 1000. Ambegaon Tahsil was added in this category for the next two census period (Figure 5). In 2011, there were 11 tahsils, existing Mulshi and Khed Tahsils have subtracted in this category and added another tahsils such as Velhe and Bhore.

Areas of Relatively Low Sex Ratio

About a third of the inhabited tahsils have below 900 females per 1000 males. In 1981, the general sex ratio proportion was lower than 900 found in Haveli (874) and Pune City (889) Tahsils mainly due to male predominate in-migration. In 1991 and 2001, only Haveli tahsil was observed in this category. In 2011, there were added two tahsils in this group, namely Khed (892) and Mulshi (899) Tahsils (Figure 6). The low proportion

of females resulted from the inflow of male migrants seeking job in private, government and other sectors.

Suggestions

1. The government should promote more higher and technical education facilities in the rural areas specifically incentive package for women education.
2. Provide free of cost education up to higher secondary level for all girls.
3. The Dowry Prohibition Act, 1961 should be strictly implemented.
4. Motivation and assistance should be given to collective marriage system.
5. Increase the status of women through the employment opportunities and higher level education etc.
6. Lastly, way of thinking of human being should be changed.

CONCLUSIONS

1. Proportion of females per 1000 males is not satisfactory in the study area. Pune District has declining sex ratio from last three decades due to mainly the education, poverty, social status of women, preponderance of male births and higher rate of female mortality. During the last 30 years, however, the sex ratio has decreased by 22 females per 1000 males owing partly to great increased in female mortality than that of males. Gender equality is still avoiding in Maharashtra and Pune District.
2. Last three decades, areas of relatively high female proportion broadly corresponded to the economically sick region and some patches elsewhere which male has characterized predominate out-migration. By contrast, low sex ratio occurred in areas experiencing male influx such as those near the urban centers and where agricultural frontier was still active.
3. This research work has summarised contributing to an explanation of the sex ratio pattern in Pune District. All the 14 tahsils in Pune showed some variability in the patterns of general sex ratio due to inflow of male migrants seeking job in private, government and other sectors.
4. Recently, Government and Non-government organizations championing the campaign for mass awareness regarding 'Save and educate the girl child' or 'beti bachao, beti padao' has to be the motto for every Indian family. At the same time, Government should implement social, employment and educational policies and changes the mentality of male concerning females.
5. The study is useful for micro level planning of district in future provides some important facts and figures. The understanding trend and patterns of sex ratio of Pune District using decennial census report of the Government of India and GIS approach provide reliable and accurate information, which cost and time effective.

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