

## Review Of Research

# SPATIO-TEMPORAL CHANGES IN LITERACY AND SEX RATIO : A CASE STUDY OF SHIRUR TAHSIL OF PUNE DISTRICT, MS

### ABSTRACT:-

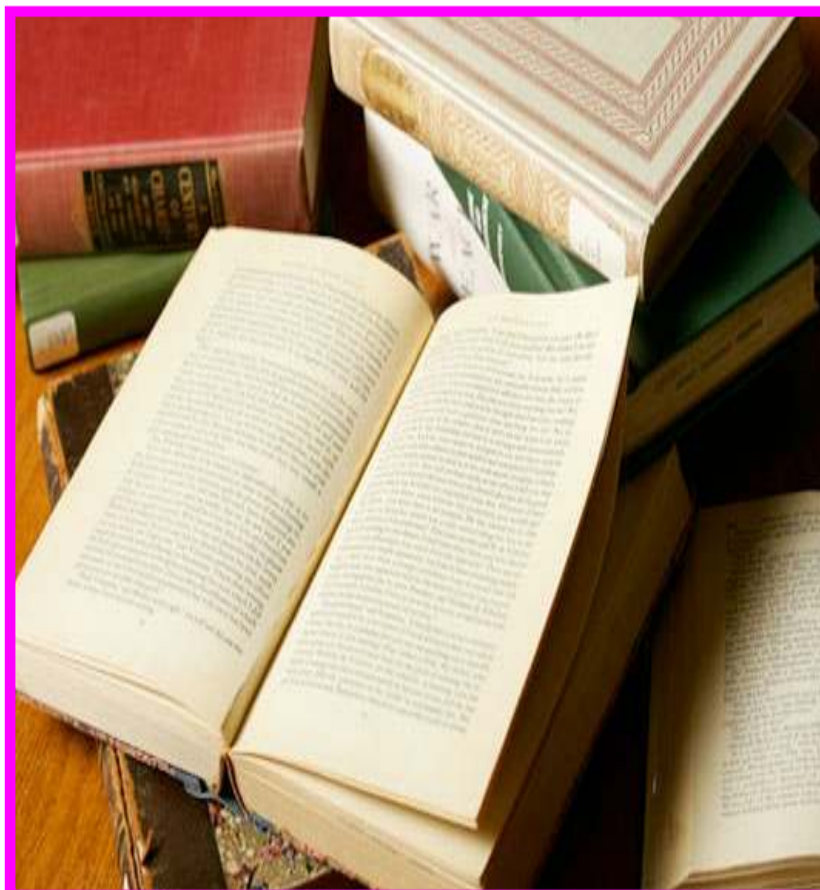
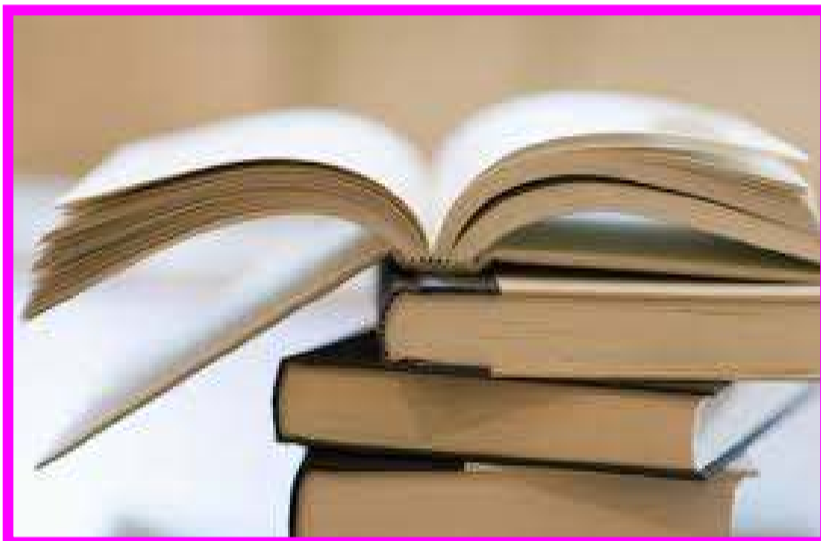
Sex ratio is a significant demographic and cultural index. Balanced sex ratio is the best indicator of developed society. Fertility, mortality, migration, literacy, traditions, culture, socio-economic conditions, standard of living etc. affect the size of family. Literacy is one of the affecting factors of sex ratio which determines the rate of fertility, size of family, good approach and attitude about the female child etc. Literacy and sex ratio both are the important indicators of any type of development and quality of human life. In the present paper an attempt has been made to analyze literacy and sex ratio patterns and the correlation between literacy and sex ratio in Shirur Tahsil, Pune District, Maharashtra. For the detail analysis in sex ratio and literacy, 117 villages of this tahsil have been studied by applying the 1991, 2001 and 2011 census data from Town and Village Directory of Pune District. ArcGIS software was applied to prepare the base map and thematic maps of the study area. Various cartographic techniques including maps and diagrams are used to depict the spatial pattern of literacy and sex ratio and their correlation. Spearman's method of correlation is employed to analyze the correlation of literacy and sex ratio. Midgulwadi, Tandali villages had the highest sex ratio and low literacy while Sanaswadi, KathapurKh villages had the lowest sex ratio and high literacy in 1991, 2001 and 2011. TalegaonDhamdhere, Ambale and Kondhapuri villages had the highest literacy and MhaseKh, Dhanore and Malthan villages had the lowest literacy in 1991, 2001 and 2011. The villages of high literacy and low sex ratio are continuously increasing. A lower number of female population in the total population is strongly suggestive of the neglect of girl children, sex selective abortions and traditional attitudes of the society. It is concluded that there was negative correlation between literacy and sex ratio in Shirur Tahsil of Pune District and it was  $r = -0.28$  and  $r = -0.31$  in 1991 and 2011 respectively.

### KEYWORDS:

Literacy, Sex ratio, literacy and sex ratio patterns, Correlation, Aquifer, Soils, Lithology

**Ratnaprabha Santosh Jadhav**

Assis. Prof., C. T. Bora College,  
Shirur, Dist. Pune,  
B. C.U.D., Savitribai Phule  
Pune University, Pune



**INTRODUCTION**

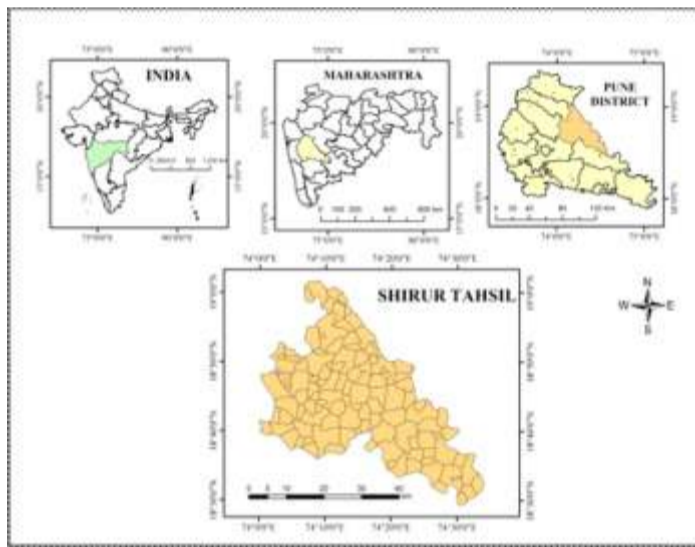
Literacy is the best indicator to promote human resources. It increases one’s knowledge and understanding against exploitation, injustice and help in decision-making and getting better employment opportunities and plays a crucial role in socio-economic well-being. It is essential for poverty reduction, mortality, curbing population growth, achieving gender equality and ensuring sustainable development, peace and democracy (Godase, 2014). In Shirur tahsil, the overall literacy was recorded only 46.44 and 61.68 percent in 1991, 2001 respectively and reached upto 72.32 percent in 2011. It showed 26 percent remarkable positive growth during the last two decades.

The sex ratio is important demographic component for the human development (Aktar, 2013). The sex composition of a population is expressed in terms of sex ratio i. e. number of female per thousand of males. As per 2011 Census, Pune District recorded 915 females per thousand males. Among the tahsils of Pune District, Velhetahsil had the highest sex ratio of 982 females per thousand males, Haveli tahsil recorded the lowest sex ratio and Shirur tahsil ranked 5th in sex ratio. Shirur tahsil as a whole had 1039 females in 1991, 935 females in 2001 and 916 females in 2011 per thousand males.

**STUDY AREA:**

Shirur Tahsil of Pune District is selected for the present research work. Shirur tahsil occupies eastern place in Pune district of Maharashtra State. It lies entirely in the Ghodnadi

**Fig. no. 1 : Location Map of Shirur Tahsil**



and Bhima basin and extends between 18°50” N to 19°02” N latitude and 74°01” E to 74°57” E longitudes, comprising an area of 1651.30 sq. km. The study area is included in Survey of India Topographic Index Numbers 47J/1, 47J/2, 47J/5, 47J/6, 47J/10 and 47J/11 on 1 : 50,000.

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This tahsil is confined by Ahmadnagar District to east and north-east, Shirur Tahsil to west, Ambegaontahsil to north-west and Haveli tahsil to South. Shirurtahsil is divided into six circles, namely Pabal, Shirur, Takali-Haji, TalegaonDhamdhare, Nhavara and Vadgaon-Rasai and covering 117 villages. It is located between Pune and Ahmadnagar District and so well connected by State Highway no.60.

**OBJECTIVES:**

1. To examine the patterns of literacy and sex ratio and spatio-temporal changes in Shirur tahsil of Pune District during the decade 1991 to 2011.
2. To analyze the correlation between literacy and sex ratio in the study area.

**DATABASE AND METHODOLOGY:**

Present research work is based on secondary data sources. Literacy and sex ratio data is obtained from the Census data of 1991, 2001 and 2011 and Pune District socio-economic statistical abstract of 2001 and 2013. The villages of Shirur tahsil are classified into high, moderate and low literacy and sex ratio classes. ArcGIS software was applied to prepare the base maps and thematic maps. The Spearman’s Rank Difference method is used to find out the correlation between literacy and sex ratio for the period 1991 to 2011.

**Spatio-Temporal Pattern of Literacy Rate (From 1991 to 2011)**

Literacy has been defined as the ability both to read and write with understanding in any language of children who are above six years of age. It reflects the socio-economic cultural set up of a community. It is the heart of basic education for all and essential for eradicating, poverty reduction, mortality, curbing

population growth, achieving gender equality and ensuring sustainable development, peace and democracy (Singh, 2013). From the demographic point of view, literacy rate and level of educational development are regarded as key variables affecting fertility, mortality and migration (Patil, 2014). In Shirur Tahsil, the level of literacy varies in rural and urban area. Table no. 1 shows the high, moderate and low categories literacy rate during the last two decades. In 1991, the literacy was 46.44 percent while it was reached to 72.32 percent in 2011. The rate of literacy was increased by 25.88 percent during the last two decades and the villages of high literacy are continuously increasing from 1991 to 2011.

**Table no. 1: Literacy Pattern in Shirur Tahsil ( from 1991 to 2011)**

Class	Literacy Category	Percent of Villages in 1991	Percent of Villages in 2001	Percent of Villages in 2011	Variation From 1991 to 2001	Variation From 1991 to 2001	Variation From 1991 to 2001
>70.01	High	0.00	0.85	55.56	0.85	54.71	55.56
60.01 to 70.0	Moderate	1.77	45.30	42.73	43.53	-2.57	40.96
< 60	Low	98.23	53.85	1.77	-44.38	-52.08	-96.46
Total	113	100.00	100.00	100.00	0	0	0

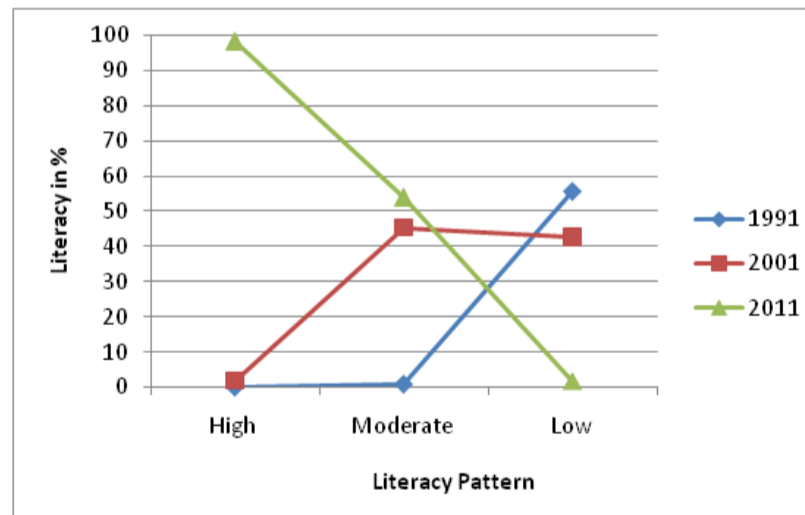
(Source : Census data of 1991, 2001 and 2011)

**High Literacy Rate from 1991 to 2011:**

Literacy is considered as one of the most important social aspects of any society’s development, especially of rural areas and it denotes essential criterion of human development. The villages which have more than 70.01 percent are included in this category. According to 1991 census of Pune District, the literacy of Shirur Tahsil was less than 50 percent. Census data of 2001 showed the overall literacy of Shirur Tahsil was 61.68 percent and only one village i. e. Ambale recorded highest literacy and it was 71.50 percent.

In 2011, the overall literacy of Shirur Tahsil was 72.32 percent. Out of 117 villages, 55.56 percent villages have more than 70.01 percent literacy and the highest literacy was recorded in Kondhapuri village and followed by Aпти village. Kondhapuri, Aпти, Dingrajwadi, Chavhanwadi, Ranjangaon Ganapati, Golegaon, Saradwadi, Pabal and lakhewadi villages are the top ten villages in literacy. Among these villages Kondhapuri, Ranjangaon Ganapati, Saradwadi, Koregaon Bhima, Shikrapur and Talegaon Dhamdhere are well connected by SH 60 to Pune and Aurangabad. The availability of educational institutions, road transport services, health services detected the advanced remarkable variations in this literacy pattern.

**Fig. No. 2 : Literacy of Shirur Tahsil From 1991 to 2011**



**MODERATE LITERACY RATE FROM 1991 TO 2011:**

The villages having literacy ranges from 60.01 percent to 70 percent are classified into moderate literacy rate. In 1991, only 1.77 percent of the villages recorded moderate literacy and that was in Talegaon Dhamdhere and Saradwadi villages. The villages of moderate literacy were increased from 1.77 percent to 45.30 percent in 2001. This positive remarkable growth in literacy is due to the educational facilities and the awareness of education. Saradwadi, Faradwadi, Burunjwadi, Pimple Khalsa, Kohakdwadi, Mukhai, Pabal, Ranjangaon Ganapati, Nimgaon Bhogi and Shirur villages detected moderate literacy. But in the decade of 2001 to 2011, the percentage of moderate literacy rate was decreased by 2.57 percent and 42.73 percent villages have moderate literacy in 2011.

**LOW LITERACY RATE FROM 1991 TO 2011:**

The villages having less than 60 percent literacy are included in low literacy class. In 1991, 98.23 percent villages had low literacy rate and the lowest literacy was observed in the village Shingadwadi (54.35 percent). Shingadwadi, Munjalwadi, Nimgaon Dude, Ravadewadi, Chandoh, Midgulwadi, Fakate, Dhok Sangavi, Dongargan and Mhase Bk. were the bottom ten villages in literacy. It was observed that from 1991 to 2011, the villages of this category were continuously decreasing and in 2011 the lowest literacy was only in Shingadwadi and Arangaon villages or 1.77 percent villages.

**SPATIO-TEMPORAL PATTERN OF SEX RATIO FROM 1991 TO 2011:**

Sex ratios are fundamental to the geographic analysis of an area, they are not only important features of landscape but also influence other demographic elements which provide additional means and materials for analyzing regional landscape (Trewartha, 1953). According to the observation of United Nation Population Division, all over the world, the male population is more than female population. It is also at Shirur Tahsil level. Here in study area, Very Low, Low, Moderate, High and Very High sex ratio patterns of sex ratio were observed.

The census data of 2011 reveals that the highest sex ratio found in Pabal Circle (969) and the lowest in Talegaon Dhamdhare Circle (884) females per thousand males respectively. The highest sex ratio was found in Echakewadi, Midgulwadi and Thapewadi Pimpalwadi villages and the lowest in Ranjangaon Ganapati, Chavhanwadi and Pimple Jagtap villages.

**VERY LOW SEX RATIO:**

The villages which have less than 850 females per 1000 males are included in very low sex ratio category. Table no. 2 indicates that the percentage of low sex ratio villages was increased from 1991 to 2011. According to 1991 census, only Koregaon Bhima and Sanaswadi villages had very low sex ratio. In 2001 very low sex ratio was recorded in 3.42 percent villages and these were Nimgaon Mhalungi, Karegaon, Koregaon Bhima and Sanaswadi villages. But in 2011, 5.13 percent villages had low sex ratio. Kathapur Kh., Pimparkhed, Jambut, Saradwadi, Chandoh and Fakate villages had very low sex ratio. The percentage of low sex ratio villages was increased by 3.36 percent from 1991 to 2011.

**LOW SEX RATIO:**

The villages which have 851 to 950 females per thousand males are included in low sex ratio category. In 1991, 23.89 percent villages recorded low sex ratio and the bottom ten villages of low sex ratio were Talegaon Dhamdhare, Adhalgaon, Wadhu Bk, Shikrapur, Pimpalsuti, Darekarwadi, Aпти, Shindodi, Mahadeo Wadi and Vitthalwadi.

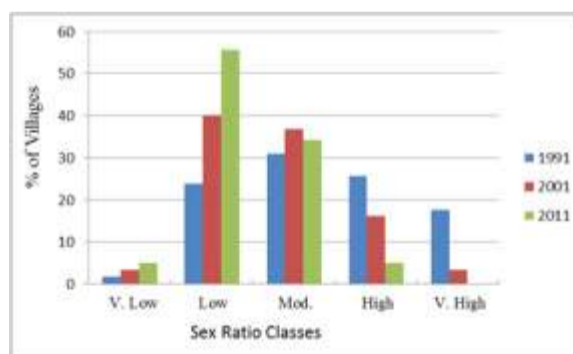
In 2001, 40.17 percent villages had low sex ratio and the bottom ten villages were Andhalgaon, Ranjangaon Ganapati, Nagargaon, Shikrapur, Pimpale Jagtap, Kuruli, Shingadwadi, Shirur, Nhavara and Kardilwadi villages. The top ten villages of low sex ratio

**Table No. 2 : Sex Ratio Pattern in Shirur Tahsil ( from 1991 to 2011)**

Sex Ratio Classes	Sex Ratio Pattern	Percent of Villages in 1991	Percent of villages in 2001	Percent of villages in 2011	Variation from 1991 to 2001	Variation from 2001 to 2011	Variation from 1991 to 2011
< 850	V. Low	1.77	3.42	5.13	1.65	1.71	3.36
851-950	Low	23.89	40.17	55.56	16.28	15.39	31.67
951-1000	Moderate	30.97	36.75	34.19	5.78	-2.56	3.22
1001-1050	High	25.67	16.24	5.12	-9.43	-11.12	-20.5
>1051	Very High	17.70	3.42	0	-14.28	-3.42	-17.7
Total		100.00	100.00	100.00	0	0	0

(Source : Census data of 1991, 2001 and 2011)

**Fig. No. 3 : Sex Ratio Pattern of Shirur Tahsil From 1991 to 2011**



were Nimgaon Bhogi, Shivtakrar Mahalungi, Sone Sangavi, Kasari, Tandali, Nimone, Takali Bhima, Thitewadi, Vadgaon Rasai, Ganegaon Dumala Villages. In 2011, low sex ratio was observed in 55.56 percent villages. Gunat, Pimpali Dumala, Sonasangavi, Khairewadi, Futanwadi Akhairmal, Dhanore, Dhimalwadi, Nagargaon, Malwadi and Ganegaon Khalasa were the top ten villages of this category. It is observed that the percentage of these villages had increased and reached up to 33.67 percent during the span of last two decades.

#### **MODERATE SEX RATIO:**

The villages which have 951 to 1000 females per 1000 males are included in moderate sex ratio category. 30.97 percent villages had moderate sex ratio. Nirvi, Waghale, Vadgaon Rasai, Kardilwadi, Dongargan, Gunat, Pimpale Khalsa, Dahiwadi, Mandavgan Farata and Kuruli villages were top bottom villages while Pimparkher, Vadner Kh., Kohakdwadi, Ambale, Tandali, Nimgaon Bhogi, Karandi, Babhulsar Kh., Annapur and Nimone villages recorded top ten villages of moderate sex ratio. In 2001, moderate sex ratio was recorded in 36.75 percent villages in which Khairewadi, Uralgaon, Apti, Fakate, Kathapur Kh., Ravadewadi, Amdabad, Pabal, Jambut and Annapur villages were top ten villages of this category. In the decade 1991 to 2001, the villages of sex ratio was increased by 5.78 percent.

Ravadewadi, Malwadi Agarkarwadi, Shastabad, Kendur, Kanhur Mesai, Sukrewadi, Savindane, Andhalgaon, Choudhar Bend and Kathapur Kh. Villages were the top ten villages and 34.19 percent villages had this sex ratio in 2011. The percentage of these villages was decreased by 2.56 percent in the last decade but during the last two decades it was increased by 3.22 percent.

#### **HIGH SEX RATIO:**

The villages which had 1001 to 1050 females per 1000 males are included in high sex ratio pattern. 25.67 percent villages had high sex ratio in 1991. Alegaon Paga, Chaudhar Bend, Digrajwadi, Jategaon Kh., Chavanwadi, Kolgaon Dolas, Kondhapuri, Pimpalwadi, Thapewadi, Pabal and Saradwadi villages were the bottom ten villages while the Varude, Khandale, Chandoh, Rautwadi, Lakhewadi, Dhok Sangavi, Kathapur Kh., Shivtakrar Mahalungi, Rakhewadi, Fhutanwadi Akharimal villages had highest sex ratio.

In 2001, 16.24 percent villages had recorded high sex ratio and the top ten villages were Echakewadi, Thapewadi, Pimpalwadi, Burunjwadi, Midgulwadi, Chincholi, Karanjawane, Savindane, Parhadwadi, Kanhur Mesai and Varude. In 2011, only 5.12 percent villages had high sex ratio and these were in the villages of Echakewadi (1027), Midgulwadi (1026), Thapewadi Pimpalwadi (1019), Jategaon Bk. (1012), Mhase Bk. (1002) and Khaire Nagad (1002). All these villages are small and remote villages with the dominance of SC and ST population. The villages of high sex ratio were decreasing by 20.5 percent during the last two decades.

#### **VERY HIGH SEX RATIO:**

The villages which had more than 1051 females per 1000 males are considered as very high sex ratio. As per census data of 1991, very high sex ratio villages are recorded in 17.70 percent villages and the top ten villages were Midgulwadi, Echakewadi, Zodagewadi, Karanjawane, Burunjwadi, Sukrewadi, Motewadi, Khaire Nagad. Midgulwadi recorded the highest sex ratio and that was 1145 females per 1000 males. In 2001, only 3.42 percent villages had very high sex ratio and the villages were Shastabad (1118), Khaire Nagad (1071), Dongargan (1070) and Sawlewadi (1058) villages. This sex ratio was absent in 2011. The percentage of villages was decreased by 14.28 percent during 1991 to 2011.

#### **CORRELATION BETWEEN LITERACY AND SEX RATIO:**

As per the data of 1991, 2001 and 2011, it has been attempted to find out the correlation between literacy and sex ratio with the help of Spearson's method. It is observed that in 1991 and 2011, there is negative correlation between literacy and sex ratio and that is -0.2794 and -0.3083 respectively. In 2001, the correlation between literacy and sex ratio was very low and that was 0.17. The main causes of negative and low correlation are the better facilities of transportation, health, education and hospitality, draught prone area, neglected of girl child, sex selective, female infanticide, migration etc.

#### **CONCLUSION:**

1. The villages of study are classified into low, moderate and high rate of literacy pattern. Talegaon Dhamdhare, Ambale and Kondhapuri villages had the highest literacy and Mhase Kh., Dhanore and Malthan villages had the lowest literacy in 1991, 2001 and 2011.
2. The villages of high literacy are continuously increasing from 1991 to 2011.
3. Very low sex ratio, low sex ratio, moderate, high and very high patterns are observed in study area. Midgulwadi, Tandali villages had the highest sex ratio while Sanaswadi, Kathapur Kh. Villages had the lowest sex ratio in 1991, 2001 and 2011.
4. The sex ratio of the study area is continuously declining during the span of 20 years due to the development of health, education and transportation services.
5. It is observed that higher the literacy rate lower the sex ratio. There is inverse correlation between literacy and sex ratio in Shirur Tahsil and it was  $r = -0.28$ , and  $r = -0.31$  in 1991 and 2011 respectively. In 2001, the correlation was positive but very negligible or low degree and that was 0.18.

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