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CORRELATION BETWEEN LITERACY RATE AND SEX RATIO IN MAHARASHTRA: A SPATIAL ANALYSIS

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ABSTRACT

Decreasing sex ratio has become a serious problem in our country as well in the state of Maharashtra. It is presumed that literate people can understand the consequences of lowering sex ratio. Beside literacy and sex ratio play an important role in the development process of the state as well as in the country. An attempt is made to study the correlation between literacy and sex ratio, and to find out whether increasing rate of literacy can help to increase sex ratio? For this study Maharashtra has been selected as the study area and the unit of the study is a district. Education is recognised as a major component of human development in the world. Literacy and sex ratio are most important indicators of development in any particular area. Literacy is an index of human development and quality of human life. It affects birth rate on the one hand and also indicates the level of economic development, living standards, status of women and technological development etc. Sex ratio of a population refers to the balance between male and female in any population. It can be expressed either in the form of proportion of a particular sex in the population or as ratio between male and female. About 64.87% of Maharashtra population recorded as literate in 1991 which has increased 76.88% in 2001 and in 2011 it reached up to 82.91% which shows increasing trend in literacy in Maharashtra. Maharashtra has sex ratio in 2011 was 925 against nation average of 940 in 2011 which is less than national average. In the present study for finding out relationship between literacy and sex ratio Spearmen's Rank Correlation method has been applied.

KEYWORDS : Correlation, Literacy, Sex Ratio, Development.

INTRODUCTION:-
Decreasing sex ratio has become a serious problem in our country as well in the state of Maharashtra. It is presumed that literate people can understand the consequences of lowering sex ratio. Beside literacy and sex ratio play an important role in the development process of the state as well as in the country. An attempt is made to study the correlation between literacy and sex ratio, and to find out whether increasing rate of literacy can help to increase sex ratio? For this study Maharashtra has been selected as the study area and the unit of the study is a district. Education is recognised as a major component of human development in the world. Literacy

and sex ratio are most important indicators of development in any particular area.

Literacy is defined as percentage of literate persons (excluding the population in the age group 0-6 years) while the crude literacy rate is the percentage of literate population to total population in a specific area. Literacy is defined as the ability to read and write the person's name and to form simple sentences. Higher literacy levels in a state denote rising socio economic development and universal literacy is a crucial step towards achieving overall progress. India has made a remarkable progress as far as literacy is concerned. In 1991 India's literacy was 52.2% and in 2001 it was 64.8% and in 2011 it has gone up to 74%. The male literacy has increased from 27% to 82% in last 60 years, literacy being one of the most important indicators of social development also essential for eradicating poverty, reduction of mortality, curbing population growth, achieving gender equality and ensuring sustainable development, peace and democracy. "Literacy for all" is the vision and slogan of India for which government has initiated various plans for implementing and achieving "Sarv Shiksha Abhiyan" as far Maharashtra State is concern it has 12th rank in literacy in India. About 82.91% people are literate as per census 2011 census. In 1991 it was 64.87% and in 2001it was 76.88%. There is a great variation in literacy at district level in Maharashtra i.e 90.90% literacy which is highest in Mumbai (suburban) and lowest 63.04% in Nandurbar District. Sex composition is also important demographic component for human development. It is generally expressed in terms of sex ratio i.e. number of females per 1000 males. All over the world the male population is more than female population. Sex composition is considered as important indicator of inequality between males and females in society .The sex ratio in Maharashtra state is 925 females per 1000 males as per the census 2011, as against Nation 940, but great variation has been observed at district level i.e. highest in Ratnagiri district (1123 Females per 1000 Males) and lowest in Mumbai (838 females per 1000 males).

STUDY AREA:

For the present paper Maharashtra has been selected as the study area. The state Maharashtra lies between 150 4' to 220 1' North latitudes and 720 30' to 800 30' East longitudes. The state extends about 800 kms. from west to east and 750 kms. in north to south orientation. Administratively the entire region has been divided into six divisions at present namely Mumbai, Pune, Nasik, Marathwada, Amravati and Nagpur divisions and it comprises in all thirty five districts. The geographical situation of Maharashtra indicates that, it is located on the Western coast of India. It enjoys the coastal length of 720 kms. of the Arabian Sea. The boundaries of the state are delimited by Gujarat in the North-West, Madhya Pradesh in the North, and Chhattisgarh in the East, Andhra Pradesh in the South-East and Karnataka and Goa in the South. The total population of the state according to the 2011 census, was 11,23,72,972 and it is the second largest State in respect of Population. Marathi is the most widely spoken and official language of the State.

OBJECTIVES:
• To study the pattern of Literacy and sex ratio in Maharashtra at district level.
• To find out the correlation between literacy rate and sex ratio.

DATABASE AND METHODOLOGY:

The present work is completely based on secondary data. The secondary data is taken from the Census of India, Maharashtra state, 2011. Variables like literacy and sex ratio are taken under consideration. Data regarding literacy and sex ratio is obtained from the census of India, Maharashtra, 2011. The collected data were analyzed to find out the literacy rate and sex ratio in Maharashtra.

Correlation between two variables viz. literacy and sex ratio was analyzed by using the Spearman's Rank Correlation method. The formula for computing Spearman's Rank Correlation is as follows:-

$$P = 1 - 6\Sigma d2/n3-n$$

Where, n is the total number of observations, and d is the difference in the ranks of the two variables in the observation.
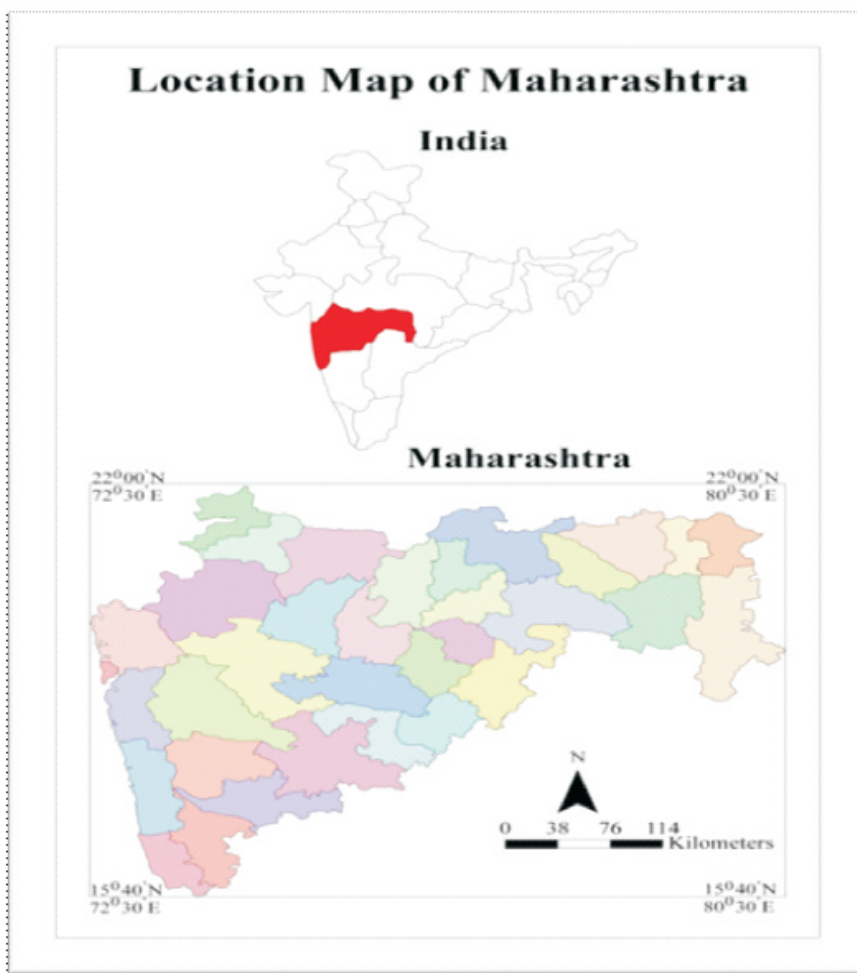
Map No. 01

LITERACY IN MAHARASHTRA:

Maharashtra has witnessed remarkable progress in literacy. In 1991 the literacy rate was 64.87%, in 2001 it was 76.88% and in 2011 Literacy has gone up to 82.91%. Literacy rate for females are traditionally lower than the literacy rate for males and this indicator of development stands as the corner stone in progress. Table.1 shows pattern of literacy rate (2011) in the state. There is wide variation in literacy percentage in different districts of Maharashtra i.e. Mumbai suburban has the highest literacy (90.90%) and the lowest rate is recorded in Nandurbar district (63.04%). Maharashtra has 12th rank in literacy among the states of India. Literacy is one of the most important indicators of development so that sincere efforts are to be made by Government and people to eradicate illiteracy from the areas which have low percentage of literacy. The range of literacy divided into three categories, that is, (i) high, (ii) moderate, (iii) low. There are 13 districts which are having literacy rate

above the average state level literacy rate (i.e 82.91percent). And there are 10 districts having literacy rate below state level but above 80 percent. Further, in 11 districts literacy rate is below 80 percent and above 70 percent. Nandurbar is the only district which is having literacy below 70 percent where it is 63.04 percent.
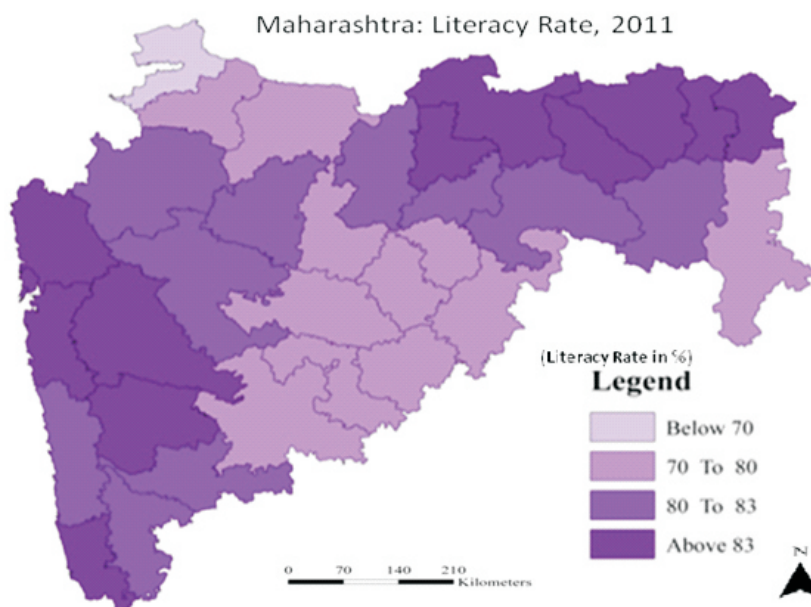
Map No. 02

SEX RATIO IN MAHARASHTRA:

Ratio between male and female also plays vital role in development of our society in many ways. It affects the labour supply through marriage and fecundity. One observes high degree of association between high sex ratio and socio economic development, particularly in those areas where sex selective migration is absent. The gender ratio in Maharashtra is 925 females per 1000 males, which is less than the national average of 940. Sex Ratio in Maharashtra varies from district to district i.e. two districts of Maharashtra have noticed very high sex ratio, more than 1000 females per 1000 males (Ratnagiri, Sindhudurg) and lowest is 838 in Mumbai. Urban areas have generally low sex ratio means males are more due to their migration from rural areas to urban centers leaving behind their families for livelihood. There are six districts where the sex ratio is above 900 but less than 925. These are Pune, Bid, Aurangabad, Osmanabad, Jalgaon and Latur. There are nine districts within the range of sex ratio below 1000 and above 950. There are six districts having sex ratio below 950 and four districts have on the above 950. On the higher side of sex ratio as it is seen in the seven districts i.e. Nandurbar, Gadchiroli, Bhandara, Satara, Gondiya, Sindudurg and Ratnagiri.
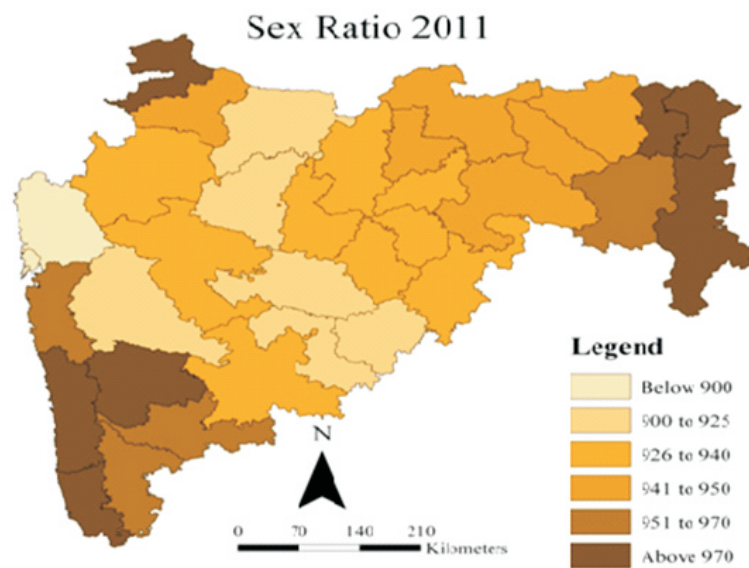
Map No. 03

Table No. 1
Literacy Rate and Sex Ratio of Maharashtra 2011.

Sr. No.	Name of District	Literacy Rate	Sex Ratio
1	Nandurbar	63.04	972
2	Dhule	74.61	941
3	Jalgaon	79.73	922
4	Buldana	82.09	928
5	Akola	87.55	942
6	Washim	81.70	926
7	Amrawati	88.23	947
8	Wardha	87.22	946
9	Nagpur	89.52	948
10	Bhandara	85.14	984
11	Gondiya	85.41	996
12	Gadchiroli	70.55	975
13	Chandrapur	81.35	959
14	Yavatmal	80.70	947
15	Nanded	76.94	937
16	Hingoly	76.04	935
17	Parbhani	75.22	940
18	Jalna	73.61	929
19	Aurangabad	80.40	917
20	Nashik	80.96	931
21	Thane	86.18	880
22	*Mumbai	90.90	857
23	Mumbai	88.48	838
24	Raigarh	83.89	955
25	Pune	87.19	910
26	Ahmadnagar	80.22	934
27	Bid	73.53	912
28	Latur	79.03	924
29	Osmanabad	76.33	920
30	Solapur	77.72	932
31	Satara	84.20	986
32	Ratnagiri	82.43	1123
33	Sindhudurg	86.54	1037
34	Kolhapur	82.90	953
35	Sangli	82.62	964

Source: Census of India, Maharashtra 2011

CORRELATION BETWEEN LITERACY RATE AND SEX RATIO:

Correlation simply means relationship between two variables viz. Independent variable and dependent variable. The factor which is supposed to be the cause is known as the independent variable and the one which is supposed to be the effect is known as the dependent variable. In the present study literacy is considered as the independent variable whereas sex ratio is considered as the dependent variable. Thus, the variations in dependent variable may be explained in term of variations in the independent variables. Spearman's Rank Correlation is another measure of the relationship between two variables using the ranked data. For a rank correlation the data may be collected either in ranked form of actual quantitative values may be converted into ranked form.

Table No. 2
Correlation between Literacy and Sex ratio in Maharashtra 2011

Sr. No.	Name of District	Literacy Rate	Sex Ratio	R_1	R_2	d	d^2
1	Nandurbar	63.04	972	35	7	28	784
2	Dhule	74.61	941	31	17	14	196
3	Jalgaon	79.73	922	24	28	4	16
4	Buldana	82.09	928	17	25	8	64
5	Akola	87.55	942	5	16	11	121
6	Washim	81.70	926	18	26	8	64
7	Amrawati	88.23	947	4	13	9	81
8	Wardha	87.22	946	6	15	9	81
9	Nagpur	89.52	948	2	12	10	100
10	Bhandara	85.14	984	11	5	6	36
11	Gondiya	85.41	996	10	3	7	49
12	Gadchiroli	70.55	975	34	6	28	784
13	Chandrapur	81.35	959	19	9	10	100
14	Yavatmal	80.70	947	21	14	7	49
15	Nanded	76.94	937	27	19	8	64
16	Hingoly	76.04	935	29	20	9	81
17	Parbhani	75.22	940	30	18	12	144
18	Jalna	73.61	929	32	24	8	64
19	Aurangabad	80.40	917	22	30	8	64
20	Nashik	80.96	931	20	23	3	9
21	Thane	86.18	880	9	33	24	576
22	*Mumbai	90.90	857	1	34	33	1089
23	Mumbai	88.48	838	3	35	32	1024
24	Raigarh	83.89	955	13	10	3	9
25	Pune	87.19	910	7	32	25	625
26	Ahmadnagar	80.22	934	23	21	2	4
27	Bid	73.53	912	33	31	2	4
28	Latur	79.03	924	25	27	2	4
29	Osmanabad	76.33	920	28	29	1	1
30	Solapur	77.72	932	26	22	4	16
31	Satara	84.20	986	12	4	8	64
32	Ratnagiri	82.43	1123	16	1	15	225
33	Sindhudurg	86.54	1037	8	2	6	36
34	Kolhapur	82.90	953	14	11	3	9
35	Sangli	82.62	964	15	8	7	7
							Σd^2=6644

P = 1 – 6 Σ d2 / n3 - n

P = 1 – 6 * 6644 / (35)3 - 35

P = 1 – 39864 / 42875 - 35

P = 1 – 39864 / 42840

P = 1 - 0.930

P = +0.07

It is observed from the above calculation that there is a positive but insignificant correlation between literacy and sex ratio i.e. +0.07. This shows that there is no significant correlation between these two variables. This means with increasing rate of literacy there is slight increase in sex ratio. This is not a desirable situation from the point of view of the present sex ratio. More efforts are yet to be taken for increasing growth of female children.

CONCLUSION:

Literacy and sex ratio both are considered as important indicators of demographic development in any region. In Maharashtra the total literacy in 1991 was 64.87 % while males' literacy was 76.56 % and females' was 52.32 %. However, it was increased in 2001 i.e. 76.88 % which included male literacy 85.97% and female literacy 67.03%. In 2011 it has gone further up to 82.91%. This shows that there is increasing trend of literacy in Maharashtra. As far as sex ratio of Maharashtra state is concerned, in 2011 it was 925 females per 1000 males which was less than the national average of 940. The present study shows that the Literacy and Sex Ratio have positive but insignificant correlation in Maharashtra. In fact the positive and significant correlation would be more desirable but as there is insignificant positive correlation is established, there are, therefore, more efforts on both the government and personal levels are to be taken for improvement in sex ratio. This may create equal balance in sex ratio in the state. Sincere efforts are to be made at all levels to increase the Sex Ratio and Literacy for overall development and betterment of the society.

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