



Research Paper

## Correlation between Child Sex Ratio and Work Participation Rate in Haryana, 2011

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**ABSTRACT:** Sex ratio is not only a term use to define number of females per 1000 males but also it is a great source to find the equality of males and females in a society at a given period of time. Sex ratio defines position and status of female in a society.

Child sex ratio is an important indicator to show the demographic structure of a society. In India, child sex ratio (0-6 years age group) is expressed as the number of female children per thousand male children. The child sex ratio is 914 female children per 1000 male children in India during 2011 which shows the worst condition of the society. There exists a great variation in child sex ratio with respect to state level in India. The highest child sex ratio (0 – 6 age group) was found in Kerala state which was 964 female children per 1000 male children during 2011. On the other hand, the lowest child sex ratio (0 – 6 age group) was found in Haryana state which was 830 female children per 1000 male children in 2011. Child sex ratio is determined by many factors. On the other hand the highest work participation rate is found in Hisar district i.e., 39.7 percent whereas the lowest work participation rate is found in Mewat district i.e., 26.6 percent during 2011. The result shows that there might be a positive correlation.

The present study shows that there exists very low limited degree positive correlation between child sex ratio and work participation rate in Haryana. Highest male work participation rate is found in Panchkula district i.e., 55.01 percent whereas the lowest male work participation rate is found in Mewat district i.e., 39.33 percent. The result shows that there might be a positive correlation. This study reveals that there exists very low limited degree positive correlation between child sex ratio and male work participation rate in Haryana. This shows that there is nothing to change in child sex ratio after the change in male work participation rate in Haryana. The rate of male work participation is not affect the child sex ratio. Highest female work participation rate is found in Bhiwani district i.e., 25.05 percent whereas the lowest female work participation rate is found in Yamunanagar i.e., 8.11 percent. The result shows that there might be a negative correlation. This is also shows that there exists very low limited degree negative correlation between child sex ratio and female work participation rate in Haryana. The analysis shows that if the female work participation rate is increase then child sex ratio may be decrease and vice versa. But the relationship exists between female work participation rate and child sex ratio is very low.

**Keywords:** Sex composition, Child Sex Ratio, Work Participation Rate, Spearman's Rank Coefficient of Correlation.

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### I. INTRODUCTION

Sex composition or Sex Ratio is a field of great interest in population study. It is an index of the socio-economic conditions and regional analysis of population of an area. Sex ratio is not only a term used to define difference between number of females and males but it is also a great source to define the equality between male and female in a society. It varies from one region to another and from one age group to another age group. In India, when sex ratio is analyzed with age specific, child sex ratio (0 – 6 age group) plays an important role. It is expressed as the number of female children per thousand male children in the age group 0 – 6 years in population. The child sex ratio is 914 female children per 1000 male children in India during 2011 which shows the worst condition of the society. There exists a great variation in child sex ratio with respect to state level in India. The highest child sex ratio (0 – 6 age group) was found in Kerala state which was 964 female children per 1000 male children during 2011. On the other hand, the lowest child sex ratio (0 – 6 age group) was found in Haryana state which was 830 female children per 1000 male children in 2011 inspite of economically developed states of India. Child sex ratio is determined by many factors such as social, economical, demographical etc.

Economic indicators are related to the human economic activities in an area. Economic activities are the activity of making, providing, selling goods or purchasing services. On the other hand, all such activities that are performed by a human to earn a living are called economic activities. All economic activities will create some types of income and economic indicators are a data about all economic activities. Economic indicators provide opportunity to analysis of economic achievement and also predicted the future performance. . The total work participation rate of the state was 39.62 per cent during 2001. The unemployment rate of Haryana is also less than 5 per cent. **(Haryana Development Report).**

In men dominant society, more economic activities are performed by men. In most of the Indian societies, men work maximum economic works during the past time. Even though there has been a rise in economic activities for women in recent times. But the value of a girl child is considered to remain cheap because people think that she gives all her support like money, time and care to her in-laws. Beside the socio-economic indicators there are various factors in India, China and Korea that affect the male and female compositions of population. Most important factor dynamic son preference in all three countries is consider being a rigorous patrilineal kinship system. Patrilineal kinship is a system in which family's lineage is maintained completely by male and productive assets are commonly inherited only by males (Das Gupta et al., 2003). So that economic factors are somewhere created change in male and female population composition.

## II. STUDY AREA

Haryana state came into existence on 1<sup>st</sup> November 1966 from Punjab state. It is situated in the northwestern part of India. It lies between 27°30' to 30°35' North latitude and 74°28' to 77°36' East longitude (Figure 1). It covers an area of 44,212 sq. km. There are 21 district, 74 tehsil, 80 statutory towns, 74 census towns and 6841 villages in Haryana state during 2011. According to Census of India 2011, Haryana has 2,53,51,462 population. In term of area, Haryana has 21<sup>st</sup> positions in India, which is spread about 44,212 sq. km and in term of population, it has 18<sup>th</sup> positions in India. The sex ratio of this state is 877 female per 1000 male which is lowest in India and child sex ratio is 830 female children per 1000 male children which is also lowest in India during 2011 (Administrative Atlas of Haryana, 2011).

## III. DATA SOURCES AND METHODOLOGY

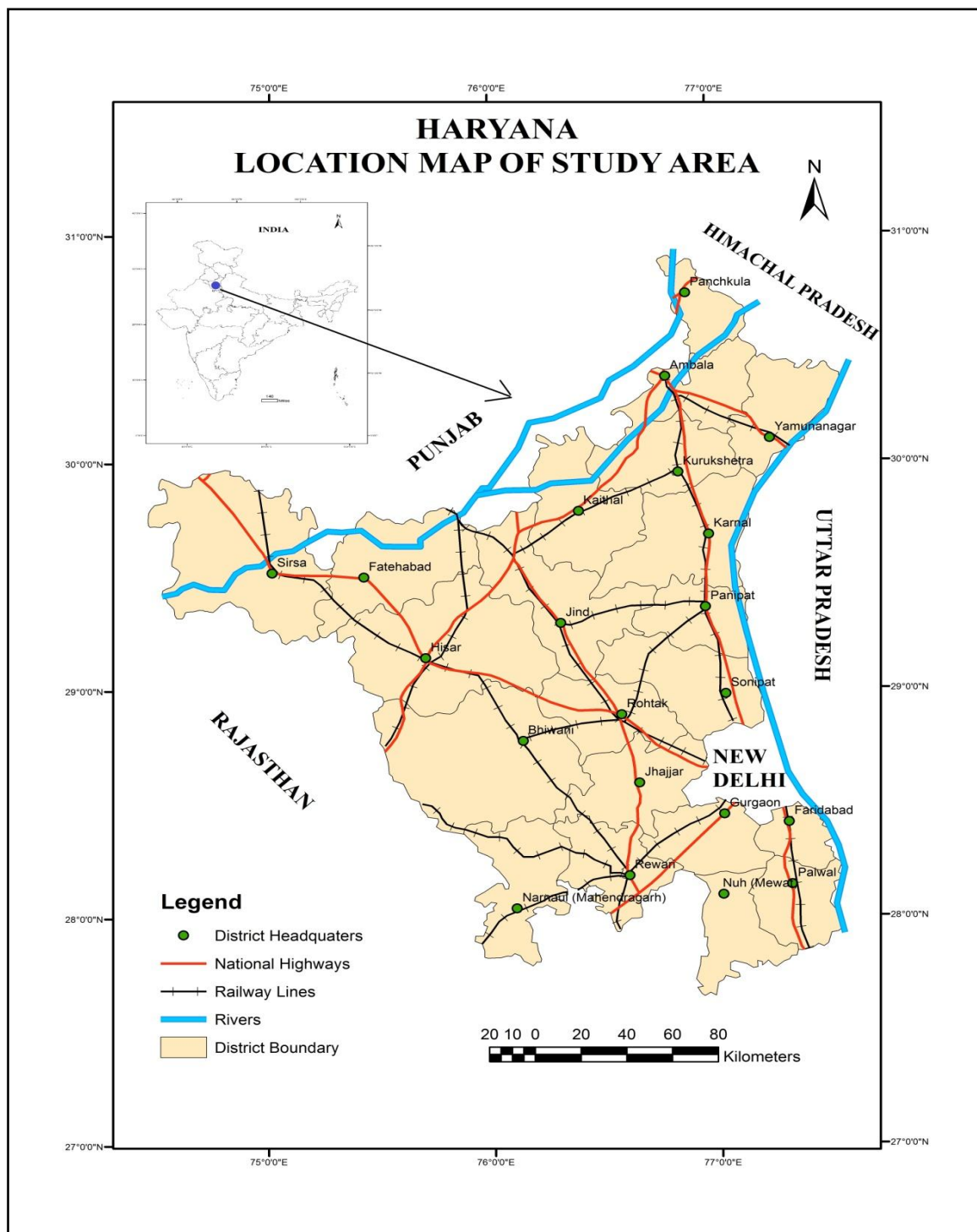
The study is related to Haryana state and based on secondary data. The data related to child sex ratio and work participation rate was calculated from Census of India, 2011. District wise child sex ratio was calculated from population of 0 – 6 years age group and it is expressed as the number of female children per thousand male children. Work participation rate is considered as the ratio between total workers and total population. In the present study, Spearman's Rank Coefficient of Correlation is selected to find out the correlation between child sex ratio and work par rate in Haryana during 2011. Major causes to select this method in present study are it is easy to calculate and simpler to understand as compared to other methods. Spearman gives formula for the calculation of coefficient of correlation method as follows:

$$R = 1 - \frac{6 \sum d^2}{N^3 - N}$$

Where R is used for Rank Correlation,  $\sum d^2$  is used for squares of the difference of rank of each pair of items in series and N is number of items in series. Sometimes, it may be possible that there are multiple items which have same value in the series. In that case all items of the same value are assigned with tied rank (average rank) or equal rank in series. In such case, the Spearman's Rank Difference method is applied with two methods i.e., Bracket Rank method and Average Rank method. There is also important change in formula with adding  $\frac{1}{12} (m^3 - m)$  in the value of  $\sum d^2$ . Here 'm' is the number of frequency an items is repeated. This adjustment is added to each repeated value in both the series (Gupta and Gupta, 2007). In such case, the formula may be written as below:

$$R = 1 - \frac{6[\sum d^2 + \frac{1}{12}(m^3 - m) + \frac{1}{12}(m^3 - m) + \dots]}{N^3 - N}$$

Beside the types of correlation, degree of correlation is also important. As per Gupta and Gupta, 2007, there are three type of degree of correlation i.e., perfect correlation, Absence of correlation and limited degree of correlation. Table 1 shows the degree of correlation proposed by Gupta and Gupta, 2007.



Sources: Resource Atlas of Haryana, 2004

Figure 1

Table 1 Degree of Correlation

Degree		Positive	Negative
1. Perfect		+1	-1
2. Limited	a. Very High	Above + 0.9 and up to + 0.99	Below - 0.9 and up to - 0.99
	b. High	Above + 0.75 and up to + 0.9	Below - 0.75 and up to - 0.9
	c. Moderate	Above + 0.25 & up to + 0.75	Below - 0.25 & up to - 0.75
	d. Low	Above 0 and up to + 0.25	Below 0 and up to - 0.25
3. Absence		0	0

Source: Gupta and Gupta, 2007.

**IV. RESULTS AND DISCUSSION**

**Correlation of Child Sex Ratio and Work Participation Rate:** Work participation rate is considered as the ratio between total workers and total population. Census of India, 1981 classified workers as main workers and marginal workers. According to Census of India, 2011, those who were work in any economic activities for 183 days or more than 183 days during the last year categorized as main workers. On the other hand, those who were work in any economic activities less than 183 days termed as marginal workers. Table 2 represents the district wise correlation between child sex ratio and work participation rate in Haryana during 2011. The maximum work participation rate is found in Hisar district i.e., 39.7 per cent workers whereas the minimum work participation rate is found in Mewat district i.e., 26.6 per cent workers during 2011. On the other hand, Mewat district has maximum child sex ratio in Haryana during 2011.

In Table 2, in series X i.e., child sex ratio, the value 807 is repeated twice. The common rank given to the value 807 is 5.5, which is the average of 5 and 6 (i.e.,  $5 + 6 = 11/2$ ) ranks which these values would have assumed if they were different. Here  $m = 2$ , so the correction factor to be added for this value will be  $\frac{1}{12}(2^3 - 2)$ . In series Y i.e., work participation rate, the value 39.2 is repeated twice. The average rank for the value 39.2 is 19.5 ( $19 + 20 = 39/2$ ). Here also  $m = 2$ , so the correction factor to be added for this value also will be  $\frac{1}{12}(2^3 - 2)$ . In this case, the formula may be written as below:

**Table 2 District wise Correlation between Child Sex Ratio and Work Participation Rate in Haryana during 2011.**

Sr. No.	District	Child Sex Ratio (X)	Rank (R <sub>1</sub> )	Work Participation Rate (%) (Y)	Rank (R <sub>2</sub> )	d = R <sub>1</sub> -R <sub>2</sub>	d <sup>2</sup>
1	Ambala	807	5.5	33	6	-0.5	0.25
2	Bhiwani	831	12	38.1	17	-5	25
3	Palwal	862	20	29	2	18	324
4	Fatehabad	845	16	39.2	19.5	-3.5	12.25
5	Mewat	903	21	26.6	1	20	400
6	Hisar	849	17	39.7	21	-4	16
7	Jhajjar	774	1	34.1	7	-6	36
8	Jind	835	14	39.2	19.5	-5.5	30.25
9	Kaithal	821	9	34.8	11	-2	4
10	Karnal	820	8	34.3	9	-1	1
11	Kurukshetra	817	7	34.9	12	-5	25
12	Mahendragarh	778	2	34.7	10	-8	64
13	Panchkula	850	18	37.7	16	2	4
14	Panipat	833	13	34.2	8	5	25
15	Rewari	784	3	37.5	15	-12	144
16	Rohtak	807	5.5	32.6	5	0.5	0.25
17	Sirsa	852	19	38.8	18	1	1
18	Sonipat	790	4	36.1	14	-10	100
19	Yamunanagar	825	10	32.1	4	6	36
20	Gurgaon	826	11	36	13	-2	4
21	Faridabad	842	15	32	3	12	144

Source: Compiled by Researcher.

$\sum d^2 = 1396$

$$R = 1 - \frac{6[\sum d^2 + \frac{1}{12}(m^3 - m) + \frac{1}{12}(m^3 - m)]}{N^3 - N}$$

$$R = 1 - \frac{6[1396 + \frac{1}{12}(2^3 - 2) + \frac{1}{12}(2^3 - 2)]}{21^3 - 21} = 0.09$$

The result shows that there might be a positive correlation. As per Table 2, there exists very low limited degree positive correlation between child sex ratio and work participation rate in Haryana.

**V. Correlation of Child Sex Ratio and Male Work Participation Rate**

Population of an area grouped into two parts i.e., male and female. So that, every work of the society is done by either male or female. In patrilineal kinship system most of the work is done by male workers. The proportion of male in work is calculated by male work participation rate in India. Table 3. shows the district wise correlation between child sex ratio and male work participation rate in Haryana during 2011. The maximum male work participation rate is found in Panchkula (55.01 percent) whereas minimum are found in Mewat district (39.33 percent) during 2011.

In Table 3, in series X i.e., child sex ratio, the value 807 is repeated twice. The common rank given to the value 807 is 5.5, which is the average of 5 and 6 (i.e.,  $5 + 6 = 11/2$ ) ranks which these values would have assumed if they were different. Here  $m = 2$ , so the correction factor to be added for this value will be  $\frac{1}{12}(2^3 - 2)$ . There is no value repeated in series Y i.e., male work participation rate. In this case, the formula may be written as below:

$$R = 1 - \frac{6[\sum d^2 + \frac{1}{12}(m^3 - m)]}{N^3 - N}$$

$$R = 1 - \frac{6[1270.5 + \frac{1}{12}(2^3 - 2)]}{21^3 - 21} = 0.17$$

The result shows that there might be a positive correlation. As per Table 3, there exists very low limited degree positive correlation between child sex ratio and male work participation rate in Haryana. This shows that there is nothing to change in child sex ratio after the change in male work participation rate in Haryana. The rate of male work participation is not affected by the child sex ratio.

**Table 3. District wise Correlation between Child Sex Ratio and Male Work Participation Rate in Haryana during 2011.**

Sr. No.	District	Child Sex Ratio (X)	Rank (R <sub>1</sub> )	Male Work Participation Rate (%) (Y)	Rank (R <sub>2</sub> )	d = R <sub>1</sub> - R <sub>2</sub>	d <sup>2</sup>
1	Ambala	807	5.5	53.46	19	-13.5	182.25
2	Bhiwani	831	12	49.62	7	5	25
3	Palwal	862	20	43.54	2	18	324
4	Fatehabad	845	16	53.19	18	-2	4
5	Mewat	903	21	39.33	1	20	400
6	Hisar	849	17	52.41	14	3	9
7	Jhajjar	774	1	48.57	4	-3	9
8	Jind	835	14	51.65	13	1	1
9	Kaithal	821	9	51.25	11	-2	4
10	Karnal	820	8	51.6	12	-4	16
11	Kurukshetra	817	7	52.55	15	-8	64
12	Mahendragarh	778	2	47.86	3	-1	1
13	Panchkula	850	18	55.01	21	-3	9
14	Panipat	833	13	50.8	10	3	9
15	Rewari	784	3	49.61	6	-3	9
16	Rohtak	807	5.5	49.96	8	-2.5	6.25
17	Sirsa	852	19	54.12	20	-1	1
18	Sonapat	790	4	50.05	9	-5	25
19	Yamunanagar	825	10	52.93	16	-6	36
20	Gurgaon	826	11	52.95	17	-6	36
21	Faridabad	842	15	49.36	5	10	100

Source: Compiled by Researcher.

$$\sum d^2 = 1270.5$$

### VI. Correlation of Child Sex Ratio and Female Work Participation Rate

Female are also play major role in work participation in a society. Portion of female in work or labour is defined in female work participation rate. It is the ratio of total female workers to the total population multiplied by hundred. In most of the country in the world, men are maximum participate in work than women. However, these gender gaps in work participation rates have been declined in recent decades. But there is

another fact that men tend to work participation more quickly than women. However, the female work participation rate is higher than three decades ago in recent time. Female work participation rate is highest in some richest and poorest countries of the world whereas, it is lowest in developing countries of the world. According to the Census of India, 2011, India has 25.6 percent female work participation rate. When it concern at state level, Haryana state is having female work participation rate below national average i.e., 17.79 percent during 2011. Table 4, represents the district wise correlation between child sex ratio and female work participation rate in Haryana during 2011. The maximum female work participation rate is found in Bhiwani district i.e., 25.05 percent whereas minimum female work participation rate is found in Yamunanagar district i.e., only 8.11 percent during 2011.

In Table 4, in series X i.e., child sex ratio, the value 807 is repeated twice. The common rank given to the value 807 is 5.5, which is the average of 5 and 6 (i.e.,  $5 + 6 = 11/2$ ) ranks which these values would have assumed if they were different. Here  $m = 2$ , so the correction factor to be added for this value will be  $\frac{1}{12}(2^3 - 2)$ . There is no value repeated in series Y i.e., female work participation rate. In this case, the formula may be written as below:

$$R = 1 - \frac{6[\sum d^2 + \frac{1}{12}(m^3 - m)]}{N^3 - N}$$

$$R = 1 - \frac{6[1620.5 + \frac{1}{12}(2^3 - 2)]}{21^3 - 21} = -0.05$$

The result shows that there might be a negative correlation. As per Table 4, there exists very low limited degree negative correlation between child sex ratio and female work participation rate in Haryana. The analysis shows that if the female work participation rate is increase then child sex ratio may be decrease and vice versa. But the relationship exists between female work participation rate and child sex ratio is very low.

**Table 4, District wise Correlation between Child Sex Ratio and Female Work Participation Rate in Haryana during 2011.**

Sr. No.	District	Child Sex Ratio (X)	Rank (R <sub>1</sub> )	Female Work Participation Rate (%) (Y)	Rank (R <sub>2</sub> )	d = R <sub>1</sub> - R <sub>2</sub>	d <sup>2</sup>
1	Ambala	807	5.5	9.82	2	3.5	12.25
2	Bhiwani	831	12	25.05	21	-9	81
3	Palwal	862	20	13.94	5	15	225
4	Fatehabad	845	16	23.63	16	0	0
5	Mewat	903	21	12.6	4	17	289
6	Hisar	849	17	25.02	20	-3	9
7	Jhajjar	774	1	17.24	12	-11	121
8	Jind	835	14	24.97	19	-5	25
9	Kaithal	821	9	16.13	11	-2	4
10	Karnal	820	8	14.75	6	2	4
11	Kurukshetra	817	7	15.03	9	-2	4
12	Mahendragarh	778	2	24.26	18	-16	256
13	Panchkula	850	18	17.81	13	5	25
14	Panipat	833	13	14.97	8	5	25
15	Rewari	784	3	24.03	17	-14	196
16	Rohtak	807	5.5	14.88	7	-1.5	2.25
17	Sirsa	852	19	21.63	15	4	16
18	Sonapat	790	4	19.75	14	-10	100
19	Yamunanagar	825	10	8.11	1	9	81
20	Gurgaon	826	11	16.08	10	1	1
21	Faridabad	842	15	12.12	3	12	144

Source: Compiled by Researcher.

$$\sum d^2 = 1620.5$$

## VII. CONCLUSION

Child sex ratio (0 – 6 age group) is expressed as the number of female children per thousand male children in the age group 0 – 6 years in population. The child sex ratio is 914 female children per 1000 male children in India during 2011. In India, the lowest child sex ratio (0 – 6 age group) was found in Haryana state which was 830 female children per 1000 male children in 2011. When concern at district level, the highest child sex ratio is found in Mewat district i.e., 903 female children per thousand male children whereas the lowest child sex ratio is found in Jhajjar district i.e., 774 female children per thousand male children. On the other hand the highest work participation rate is found in Hisar district i.e., 39.7 percent whereas the lowest work participation rate is found in Mewat district i.e., 26.6 percent during 2011. The result shows that there might be a positive correlation. As per Table 2, there exists very low limited degree positive correlation between child sex ratio and work participation rate in Haryana. Highest male work participation rate is found in Panchkula district i.e., 55.01 percent whereas the lowest male work participation rate is found in Mewat district i.e., 39.33 percent. The result shows that there might be a positive correlation. As per Table 3, there exists very low limited degree positive correlation between child sex ratio and male work participation rate in Haryana. This shows that there is nothing to change in child sex ratio after the change in male work participation rate in Haryana. The rate of male work participation is not affect the child sex ratio. Highest female work participation rate is found in Bhiwani district i.e., 25.05 percent whereas the lowest female work participation rate is found in Yamunanagar i.e., 8.11 percent. The result shows that there might be a negative correlation. As per Table 4, there exists very low limited degree negative correlation between child sex ratio and female work participation rate in Haryana. The analysis shows that if the female work participation rate is increase then child sex ratio may be decrease and vice versa. But the relationship exists between female work participation rate and child sex ratio is very low.

## REFERENCES

- [1]. Administrative Atlas of Haryana (2011) *Haryana – a geo-historical outline*. Chandigarh: Director of Census Operations, Haryana. Ministry of Home Affairs, Government of India: 228-235.
- [2]. Agriculture Contingency Plan of district Sonapat (2001) Hisar: Department of Agriculture. CCS Haryana Agriculture University, Haryana: 1-2.
- [3]. Census of India (2001) *Administrative Atlas of Haryana*. Chandigarh: Directorate of Census Operations, Haryana: 249 – 250.
- [4]. Census of India (2011) *Administrative Atlas of Haryana*. Chandigarh: Directorate of Census Operations, Haryana: 249 – 250.
- [5]. Gupta Das M, Zhenghua J, Bohua L, Zhenming X, Chung W, Bae H. Why is son preference so persistent in East and South Asia? A cross-country study of China, India and the Republic of Korea. *The Journal of Development Studies*. 2003 December; 40(2):153–187.
- [6]. Gupta, S.P. and Gupta, M.P., 2007. *Business Statistics* Sultan Chand and Sons. *New Delhi*.
- [7]. Resource Atlas of Haryana (2004) Chandigarh: State Natural Resources Data Management System (NRDMS) centre, Hisar. Haryana State Council for Science and Technology (Science and Technology Department, Haryana): 9-30.
- [8]. Sangwan, Dr. Randhir Singh and Kumari, Geeta. (2019). A Comparative Study of Literacy Rate in Mewat and Mahendragarh District of Haryana, 2011. *Journal of Advances and Scholarly Researches in Allied Education*. 16 (6), p1140-1145.
- [9]. Sangwan, Dr. Randhir Singh and Kumari, Geeta. (2019). Spatial-Temporal Change in Child Sex Ratio in Haryana: A Geographical Analysis. *Journal of Advances and Scholarly Researches in Allied Education*. 16 (5), p978-987.
- [10]. Singh, Devender, Singh, Dr. Mehtab, Gupta, Dr. J. P. (2017). Relationship of Rainfall and Depth to Groundwater Table in Sonipat District of Haryana, India. *The Konkan Geographer*. 17, 187-192
- [11]. Statistical Abstract of Haryana (2012 – 13). Chandigarh: Department of Economics and Statistical Analysis, Haryana. Available at: <http://www.esaharyana.gov.in> (Last accessed 15th April 2015).