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Spatial-Temporal Change in Child Sex Ratio in Haryana: A Geographical Analysis

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Abstract – Male and female are two pillars of population structure of any society. The balance between these two is represented by a ratio i.e., called sex ratio. It is mostly expressed as the number of females per thousand of males in India. In India, child sex ratio is indicated as the number of female children per thousand male children in the age group of 0-6 yrs. So, these are having a great interest to the population geographers. This paper tries to represent the spatial and temporal changes of sex ratio as well as child sex ratio in Haryana from 1981- 2011. India is one of the countries in the world where males are higher in number as compared to females. Sex ratio in India was 941 during 1961; afterward it is found in declining trend and reached up to 940 females per thousand males during 2011. In the other hand, sex ratio and child sex ratio of Haryana are the lowest among all the states of India. Child sex ratio of India is in worst condition.It is declining continuously from 976 in 1961 to 914 in 2011.In this present paper; spatial variations of sex ratio and child sex ratio in Haryana have been analyzed from 1981 to 2011.

Key Words: Male, Female, Child Sex Ratio, Temporal Changes, Trends, Variations.

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INTRODUCTION

Population is one of the most important components of Human Geography. To study the population structure of an area, first of all, the Population Composition of the society is necessary to understand. Population Composition is the structure of population defined by its characteristics such as age, sex, race, language, literacy, rural-urban ratio, occupation, religion etc. Out of these, the most basic element of population structure is sex-composition. This element differs significantly from one geographical area to another. Sex is an important tool for regional analysis of population. 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. It is an important social indicator to represents the prevailing equity between males and females, and also presents the gender discrimination in a society. Sex ratio is mostly expressed as the number of females per thousand of male in India. Whereas, internationally, sex ratio is expressed as number of females per 100 of males in the population. Sometimes it also expressed as the number of males per thousand females, where female are larger in number. Sex ratio defines position and status of female in a society. The **Census of India, 2011** revels that sex ratio has fallen from 946 to 940 females per male during 1951 to 2011. After the post-independence, the Indian population continued to suffer from the declining of females. When the females are in very low stage with the comparison of males, there will be a huge imbalance established among males and females. It creates gender imbalance in the society which is an important social indicator to evaluate the degree of present equity between males and females in a society. The Child Sex Ratio (0-6 year age group) is even in worse condition in India. The child sex ratio has been declining even more sharply. Child sex ratio was 976 girls per 1000 boys during 1961 which is declined and reached up to 914 during 2011 **(Census of India, 2011).** Sex ratio is the most important and visual indicator of gender imbalance, which is really a big problem in front of India. The problem prevails with higher intensity especially in the northern India; out of this Haryana is the worse hit state.

Haryana is located in the northwester part of the country. It came into existence on 1st November, 1966. It is one of the most economically developed states of India. The state economy has undergone major changes after its formation. The primary sector of Haryana economy is shifting to secondary and tertiary sectors. It progressed quickly with a growth rate of 5.5 per cent per annum. The economy of the state is based on agriculture, industrial development, manufacturing and retails.

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The share of primary, secondary, and tertiary sector was 28.2 per cent, 27.4 per cent and 44.4 per cent respectively during 2004 – 05. The agricultural production index in Haryana was 243.42 during 2004 – 05. As a result, Haryana is one the largest contributors of food grains at national level. The industrial production index is also more than the national average. It has 2nd highest progress in both agricultural and industrial sectors. In term of area, Haryana has 21st positions in India, which is spread about 44,212 sq. km and in term of population, it has 18th positions in India. It is one of the few states in India whose decadal growth rate of population has showed almost an ignorable change over the last three decades. Total Fertility Rate (TFR) of the state is also near to the replacement level of fertility. The Human Development Index (HDI) of the state was 0.509 with the ranked of 5 in all states of India during 2001. The total work participation rate of the state was 39.62 per cent during 2001. The sex ratio of the state has varies from 835 to 877 during past hundred years, which creates the gender inequality **(Haryana Development Report)**. As per the **Census of India, 2011**, Haryana's sex ratio was 877 women per 1000 men. This low sex ratio of Haryana has been debated at state as well as national level. Historically, it has had an unfavourable sex ratio for women. Sex ratio of the state was 867 during 1901. It was the same during 1971 and increase to 870 during 1981 but also declined marginally to 865 during 1991 and continuously declined to 861 during 2001. The child sex ratio of state is also lowest in India. It has been declining even more sharply. It has also witnessed a decline of 80 points in child sex ratio during 1961 to 2011. The rate of decline of child sex ratio has been even more conspicuous since 1981. Child sex ratio has gone down from 902 to 819 which is a decline of 83 points during 1981 to 2001. In Haryana, out of the 21 districts, 11 districts display child sex ratio below the state's average (830 female children per 1000 male children) and five of them have recorded a decrease in child sex ratio during the decade 2001 – 2011.

STUDY AREA

The study is analysis the trend and pattern of child sex ratio in Haryana state. This state came into existence on 1st November 1966, derived from Punjab state. Haryana's geographical location is North-west and it lies between 27°30' to 30°35' North latitude and 74°28' to 77°36' East longitude (Figure1).The total area of state is 44212 sq. km and accounts 1.37per cent of country's total area.There are 21 districts, 74 tehsils, 80 statutory towns, 74 census towns, 116 Blocks and 6841 villages in Haryana state during 2011. According to Census, 2011, Haryana has 2, 53, 51,462 population and density is 573 persons per sq.km with the 18th rank in all the states of India. The sex ratio of the study area is 877 females per 1000 male which is lowest in India. The child sex ratio is 830 female children per 1000 male children which is also lowest in India during 2011. So, this state has been chosen as case study. Presently, Haryana state is divided into six administrative divisions namely Ambala, Rohtak, Gurgaon, Hisar, Karnal and Faridabad for administrative purposes. These divisions are divided into 72 subs – divisions (https://en.m.wikipedia.org/wiki/Haryana). Haryana is bounded on the north by Punjab, Himachal Pradesh and on the west and south and on the eastern border touched by Uttaranchal & Uttar Pradesh. Yamuna River makes its eastern boundary. According to **Duggal, 1971,** the Haryana state is divided into six physiographic regions i.e., Siwalik Hills, Piedmont Plain, Flood Plain, Upland Alluvial Plain, Plains with Sand – Dunes and Plains with Aravalli Hills and Sand – Dunes. . Due to continental affect, the climatic conditions of the state are found extremely hot in summers and cool in winter. The state also experiences the monsoon and western disturbance rainfall. Haryana state receives 650 mm average annual rainfall. Haryana is an agricultural state where more than 75 per cent population of the state involves in agricultural activities and about 85 per cent area of the state is under cultivation.

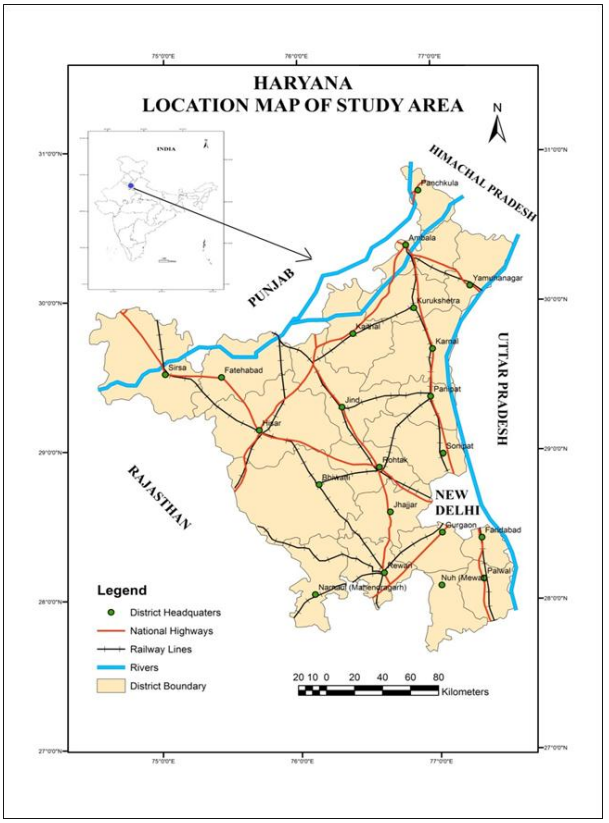

Figure 1

DATA SOURCES AND METHODOLOGY

The study is based on secondary data which are obtained from different government and semi-government publications. Statistical Abstracts of Haryana has provided detailed information about various aspects of the state as well as district. Boundaries of districts have been prepared from

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Administrative Atlas of Haryana, 2011. Various publications of Census of India, 1981, 1991, 2001, 2011 have provided valuable information related to sex ratio, child sex ratio, population of the study area, etc.

Descriptive approach is adopted for this study. This approach has highlighted the overall pattern of child sex ratio. The results of data analysis have been presented in the form of maps, tables, graphs and other statistical diagrams. Choropleth method has been used for representing the data on maps. In addition to these cartographic and graphic techniques, statistical methods and formulae have been used to analyse the data. The chief secondary sources of data for the present study have been: -

1) Statistical Abstract of Haryana (Various Years).

2) Department of Economic and Statistical Analysis, Haryana.

3) Census of India, 2011, Primary Census Abstract of Haryana with tables on Houses, Household Amenities, Assets, Directorate of Census operation, Haryana.

4) Administrative Atlas of Haryana, 2011. Directorate of Census operation, Haryana.

5) Resource Atlas of Haryana, 2004.

RESULTS AND DISCUSSION:

TREND OF SEX RATIO IN HARYANA: Figure 2 presents the trend of overall sex ratio of India, Haryana during 1951 to 2011. This duration shows great variation in comparison to state and national level. Overall sex ratio in India was 946 during 1951; afterward it is found in declining trend and reached up to 933 females per thousand males during 2001 at national level. Again there is a slight rise in overall sex ratio and it reached at 940 females per thousand males during 2011 in India. The trend of overall sex ratio is also found decreasing in Haryana. Overall sex ratio of Haryana state has declined from 871 to 861 females per thousand males during 1951 to 2001. While, overall sex ratio of Haryana state has increased during 2001 – 2011 and reached up to 879 females per thousand males. But it is still below the national average.

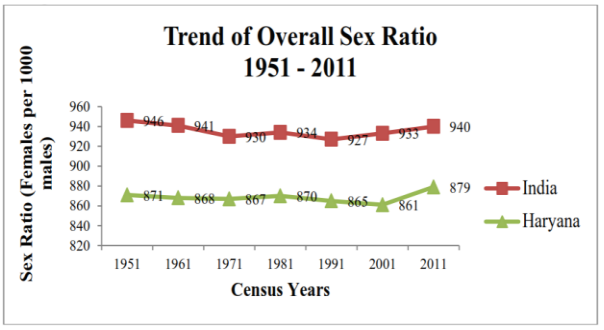

Figure 2

District wise sex ratio in Haryana (2011): Figure3 represents, In Haryana out of 21 districts Gurgaon district has the lowest sex ratio 854 and Mewat has the highest sex ratio 907 according to census 2011.If we comparably see district wise sex ratio, then we will come to know that 10 districts have sex ratio more than the average of state but all 21 districts are having below the national average as 914 female children per thousand male children. There were found 11 districts having more than 879(Haryana's sex ratio) which are shows in table1

Table 1

S.NO	DISTRICTS	SEX RATIO
1	AMBALA	885
2	BHIWANI	886
3	PALWAL	880
4	FATEHABAD	902
5	MEWAT	907
6	HISAR	872
7	JHAJJAR	862
8	JIND	871
9	KAITHAL	881
10	KARNAL	887
11	KURUKSHETRA	888
12	MAHENDRAGARH	895
13	PANCHKULA	873
14	PANIPAT	864
15	REWARI	898
16	ROHTAK	867
17	SIRSA	897
18	SONIPAT	856
19	YAMUNANAGAR	877
20	GURGAON	854
21	FARIDABAD	873
	HARYANA	**879**

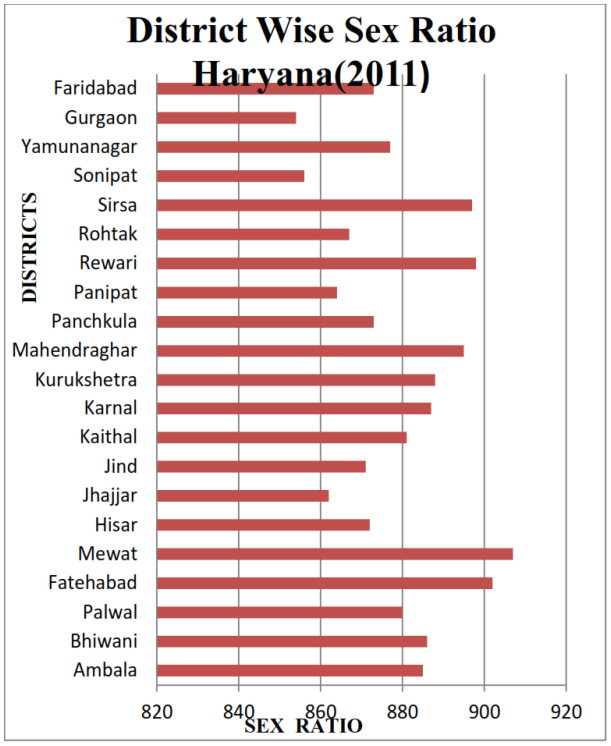

Figure 2

TREND OF CHILD SEX RATIO IN HARYANA: In India, when sex ratio is analysed with age specific, child sex ratio (0 – 6 age group) plays an important role. 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 greatvariation 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. After 1961, there has been continuous decrease in child sex ratio from national to district level. Child sex ratio in India during 1961 was 976 girls per thousand boys. It has declined up to 914 girls per thousand boys during 2011. The decreasing trend in child sex ratio shows that if it continues then it will affect the upcoming population and create imbalance in society. In the Haryana state, Child sex ratio has always been below national average during 1951 to 2011. It is decline continuously from 910 girls per thousand boys in 1961 to 830 girls per thousand boys in 2011. In Haryana state, the lowest child sex ratio is found during 2001 which is 818 girls per thousand boys. After 2001, there is slight rise in child sex ratio in Haryana and it reached at 830 girls per thousand boys. It shows an increase of 11 girls during last decade. Figure 3 shows trend of child sex ratio (1961-2011) of India as well as Haryana.

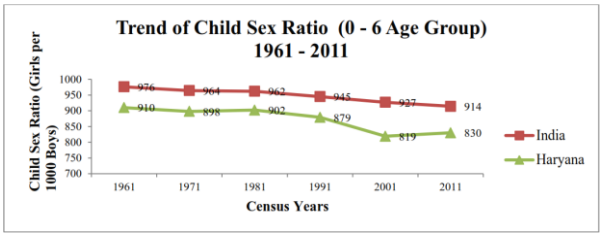

Figure 3

SPATIAL PATTERN OF CHILD SEX RATIO IN HARYANA (1981 – 2011)

District wise child sex ratio and decadal changes in child sex ratio during 1991, 2001, and 2011 is represented by Table 2 and Figure 5. The average child sex ratio of the state has continuously been declining from 879 to 830 girls per thousand boys during 1991 to 2011. During 1991 to 2001, the child sex ratio has sharply declined and has reached at 819 girls per thousand boys. After 2001, there is slight increase in child sex ratio and it reached at 830 girls per thousand boys. The highest child sex ratio is found in Mewat district which has 903 girls per thousand boys during 2011. It is followed by Palwal district in which child sex ratio was 862 girls per thousand boys. On the other hand, the lowest sex ratio was recorded in Jhajjar district which was 774 girls per thousand boys during 2011. It is followed by Mahendragarh district in which child sex ratio was 778 girls per thousand boys during the same period of time.

Table: 2 District Wise Child Sex and Decadal Changes of Haryana during 1981–2011.

District	1981	1991	2001	2011	Change 1981 to 1991	Change 1991 to 2001	Change 2001 to 2011	Change 1991 to 2011
Ambala	919	888	782	807	-31	-106	25	-81
Bhiwani	913	885	841	831	-28	-44	-10	-54
Palwal	NA	NA	854	862	NA	NA	8	NA
Fatehabad	NA	873	828	845	NA	-45	17	-28
Mewat	NA	NA	893	903	NA	NA	10	NA
Hisar	893	864	832	849	-29	-32	17	-15
Jhajjar	NA	886	801	774	NA	-85	-27	-112
Jind	865	858	818	835	-7	-40	17	-23
Kaithal	NA	854	791	821	NA	-63	30	-33
Karnal	912	871	809	820	-41	-62	11	-51
Kurukshetra	874	868	771	817	-6	-97	46	-51
Mehendragarh	918	892	818	778	-26	-74	-40	-114
Panchkula	NA	890	829	850	NA	-61	21	-40
Panipat	NA	889	809	833	NA	-80	24	-56
Rewari	NA	894	811	784	NA	-83	-27	-110
Rohtak	915	868	799	807	-47	-69	8	-61
Sirsa	928	883	817	852	-45	-66	35	-31
Sonipat	865	878	788	790	13	-90	2	-88
Yamunanagar	NA	888	806	825	NA	-82	19	-63
Gurgoan	928	895	807	826	-33	-88	19	-69
Faridabad	892	884	847	842	-8	-37	-5	-42
Haryana	**902**	**879**	**819**	**830**	**-23**	**-60**	**11**	**-49**

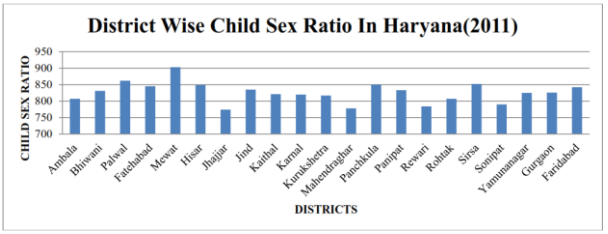

Figure 4

District wise decadal change in child sex ratio during 1991 – 2011 is also shown in Table 2 and

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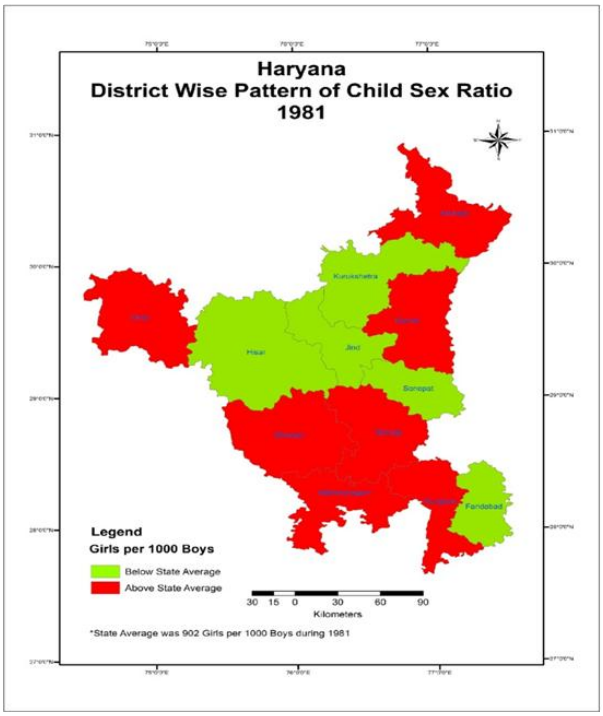
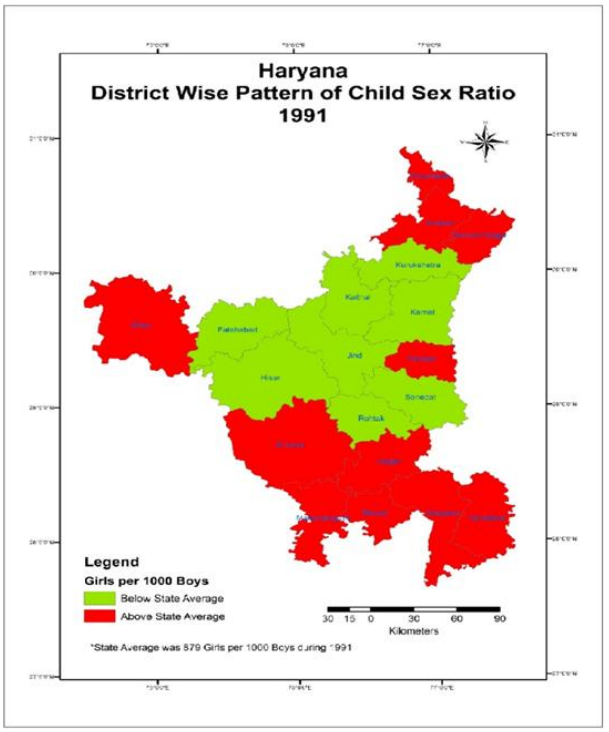
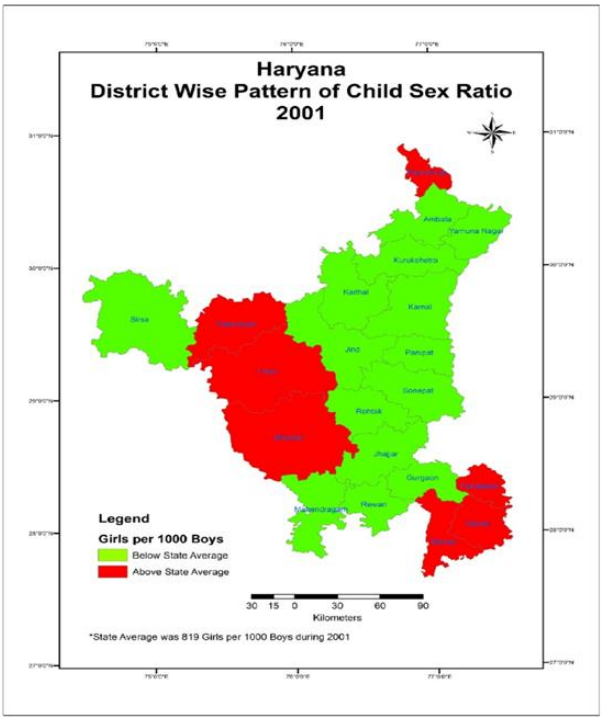
Figure 5. The child sex ratio of the state has been declining even more sharply. It has also witnessed a decline of 60 points in 1991 to 2001. Afterword, a little increase i.e., 11 point, in child sex ratio was observed in Haryana. In Haryana, out of the 21 districts, 11 districts display child sex ratio below the state's average (830 girls per thousand boys) and five of these have recorded a decrease in child sex ratio during the decade 2001 – 2011. Among these, maximum decrease has been observed in Mehendragarh district in which decline is 40 points during the same period. It is followed by Jhajjar district (27 points) of Haryana. The continuous decline in child sex ratio is observed in Mehendragarh, Jhajjar, Rewari, Bhiwani and Faridabad district since 1991. The maximum decline in child sex ratio is found in Mehendragarh i.e. 114 points during last two decades. Second negative change is found in Jhajjar district which was 112 points during the same period of time.







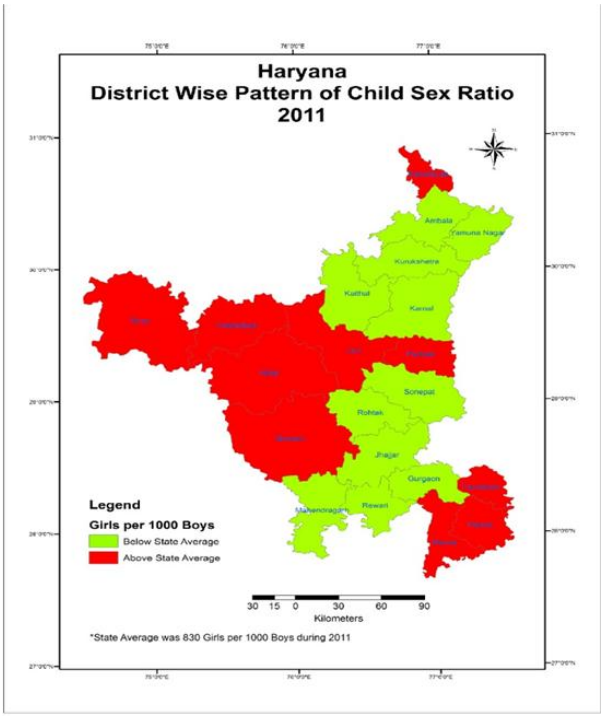
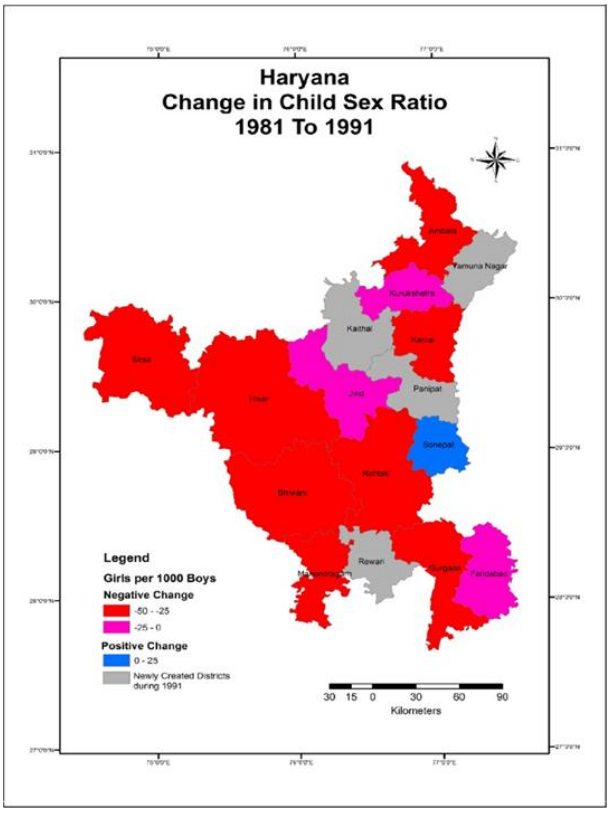


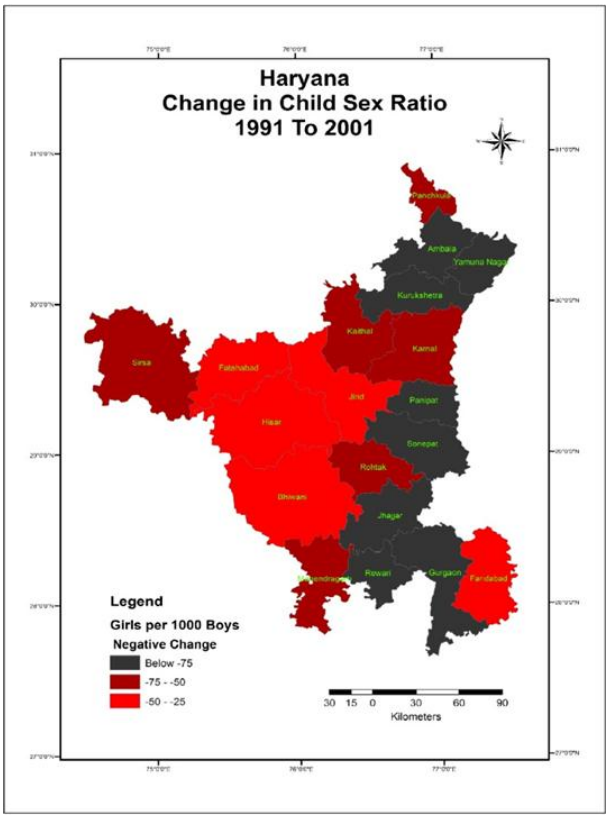
Figure 5

Table 3 and Figure 5 show the numbers of districts below and above state average of child sex ratio in Haryana during the census years 1991, 2001 and 2011. The average child sex ratio was 879 girls per thousand boys in 1991. During this census year, 8 districts were below state average of child sex ratio whereas 11 districts were above state average of child sex ratio. After 1991, the child sex ratio was declined and reached up to 819 girls per thousand boys in 2001. During 2001, 14 districts were below state average of the child sex ratio whereas only 7 districts were found above state average child sex ratio. As comprised to pervious census year, this year shows the great decline in child sex ratio at district level. After 2001, child sex ratio in Haryana shows an increasing trend and has increased up to 830 girls per thousand boys. But the district wise status of child sex ratio remains like pervious census year. During 2001 – 2011, out of 21 districts, 11 districts are below state average of child sex ratio and 10 districts are above state average of child sex ratio.

Table:3 Numbers of Districts Below and Above State Average of Child Sex Ratio in Haryana During 1981 to 2011.

Census Years	Average State Child Sex Ratio	Number of District		Total
		Below State Average	Above State Average	
1981	902	5	7	12
1991	879	8	11	19
2001	819	14	7	21
2011	830	11	10	21





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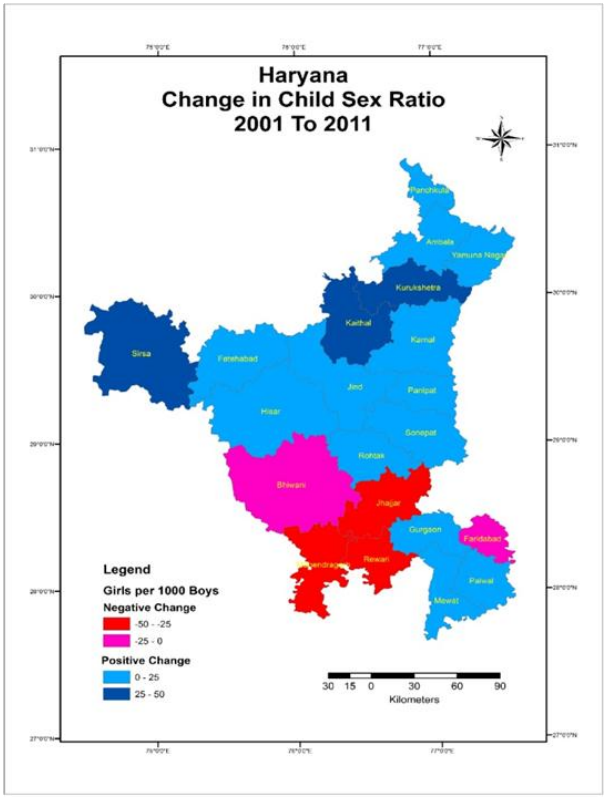

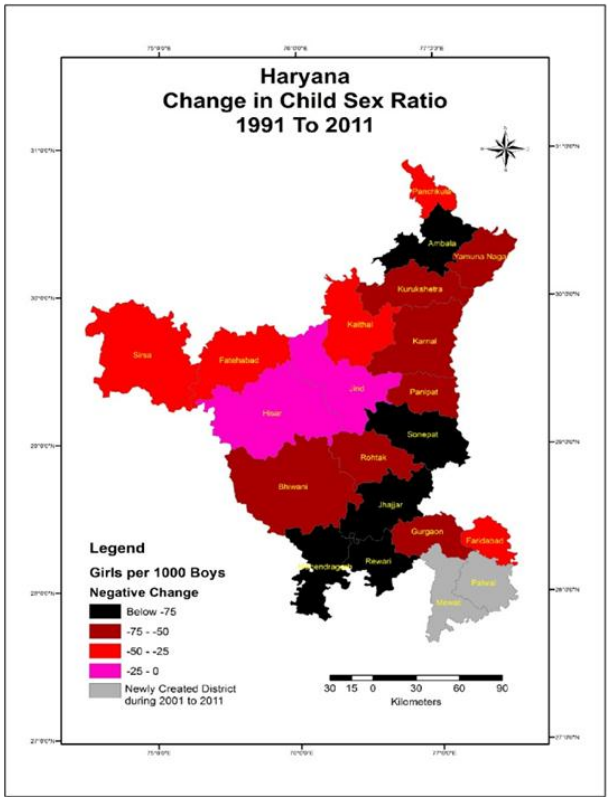

Figure 6

Table 4 and Figure 6 also represent the district wise decadal changes in child sex ratio of Haryana during 1991 to 2011. During 1991 to 2001, the maximum numbers of districts i.e., 13 are found in 50 – 100 range of negative change category. There was no district which shows positive change in child sex ratio during the same period of time. Out of 21 districts, 16 districts show positive change in child sex ratio during 2001 – 2011. About 5 districts of Haryana show the negative change of up to 50 points in child sex ratio during the same period of time. As far as child sex ratio in Haryana during 1991 to 2011 is concerned, there was a decline in child sex ratio in the study area. The maximum number of districts i.e. 9 districts were found in 50 to 100 range of negative change in child sex ratio. About 7 districts were found in below 50 range of negative change in child sex ratio. Out of 19 districts, 3 districts show the negative change in child sex ratio more than 100 points during last two decades. There was no district which shows positive change in child sex ratio during last two decades.

Table: 4 District-wise Decadal Changes in Child Sex Ratio of Haryana during 1981 – 2011.

Decadal Change in Child Sex Ratio		Number of Districts During Various Census Years			
		1981 - 1991	1991 – 2001	2001 – 2011	1991 – 2011
Negative Change	Below -75	0	8	0	5
	-75 – -50	0	6	0	7
	-50 – -25	8	5	3	5
	-25 – 0	3	0	2	2
Positive Change	0 – 25	1	0	13	0
	25 - 50	0	0	3	0
Total		12	19	21	19

Factor Affecting Child Sex Ratio:

Some basic factors which affect the child sex ratio and disturbing the gender balance among children. These are interlinked with each other indirectly. Some studies show the factors which represent low child sex ratio in Haryana such as:

► **Socio-economic and Cultural Factors:-**

Throughout history and in many societies including India, gender inequality was a part and parcel of an accepted male-dominated culture Zameer Ahmad Bhat (2014) somesocio-economic factors which effecting the child Sex Ratio and can reasons for gender imbalance among children:-

- **Education:** Education is in increasing way so there is a strong inverse relationship between female literacy and fertility. As women's schooling has expanded, fertility, rates have fallen, and the pressure on a couple to have a male child increased. (Arindam Nandi and Anil B. Deolallikar, 2011). One hand education reduced the C.S.R. and another hand education improved the C.S.R. in many societies. Low rural female literacy rate, low status given to women, high fertility rate because of early marriage of girls, poor of female in family decision making with regard to number and sex of now-born baby consideration of more hands for earning (Sangwan & Sangwan, 2013) on the other hand education decline the CSR by connected with taking decision and work load among literate women.

- **Poverty:-** Poverty affects the woman most in the family are rejected education, healthcare, nutritious food, sanitation affects the girl babies. So girl children are discriminated the boys. Poor families cannot afford to send are of their children to school, parents favour investing in the boy-children keeping the girls at home to help with domestic work or some income generation activity. Girls being married at younger age and young brides and their children are more likely to suffer from increased mortality associated with early child-birth.

- **Religious & Caste:-** It is generally considered that religious also affects the child sex Ratio. Among the Christians and Muslims the child Sex Ratio is relatively higher. There is no social practice of female feticide and infanticide among them. They considered that children are Allah's creations. Lower castes like landless castes, requirement of more and more children as agricultural labourers (Sangwan & Sangwan 2013). The British identified the high cast Bedis, Khatris, and Rajputs as primarily responsible for infanticide (Snehi, 2003: 4302).

- **Work:**- The fact that women's participation in the formula work force raises the opportunity cost of a child and lower fertility. In the face of strong son preference, this induces couples to sex-select their children in favour of boys. (Arindam Nandi and Anil B. Deolalikar, 2011)

- **Accessibility of health centres:-**The availability of a nurse midwife or a registered private doctor in a village makes it easier for couples to access prenatal sex determination tests and sex selective abortion services (Srivastave 1998, Ganatra et al. 2001, Deolalikar et al. 2009) thus skewing the child sex ratio and creates the gender imbalance.

- **Medical Technologies :-** Due to two decades, there are many techniques became widely spread for sex determination like as ultrasound, sonography, Pre-Matal Diagnostic test etc. fetal sex determination techniques such as amniocentesis, originally intended for the detection of fetal abnormalities, were first introduced in 1975 (Luthra, 1994). The misuse of these techniques, for aborting female fetuses rapidly became a major concern, and it remains so till this day (George and Dahiya 1998, Sudha and Ranjan 1999, Arnold, et. al. 2002 George 2002, UNFPA 2001).

- **Increasing the crimes, Domestic Violence and Trafficking in Girls: -** Crime against women occurring in every minute; day by day these are in increasing way among women. The national capital Region and Delhi Continues to remain the most unsafe city in India (Zameer Ahmad Bhat, 2014). In state like Haryana, It has been observed that girls are not safe in schools, colleges or any other places. Because of this, sons are given more preference than daughter.

► **Demographical Factors :-**

The main reason behind this is social economic factors which indirectly affects all these:-

- Child Sex Ratio at Birth.
- Fertility Rate.
- Differentials in Mortality.
- Migration.

CONCLUSION:

The present research work has highlighted the existing situation of sex ratio and child sex ratio in Haryana state as well as all districts of Haryana. As per **Census of India, 2011**, Haryana's sex ratio was 877 women per 1000 men. This low sex ratio of Haryana has been debated at state as well as national level. Historically, it has had an unfavourable sex ratio for women. Sex ratio of the state was 867 during 1901. It was the same during 1971 and increased to 870 during 1981 but also declined marginally to 865 during 1991 and continuously declined to 861 during 2001. The child sex ratio of state is also lowest in India. It has been declining even more sharply. It has also witnessed a decline of 80 points in child sex ratio during 1961 to 2011. The rate of decline of child sex ratio has been even more conspicuous since 1981. Child sex ratio has gone down from 902 to 819 which is a decline of 83 points during 1981 to 2001. In Haryana, out of the 21 districts, 11 districts display child sex ratio below the state's average (830 female children per 1000 male children) and five of them have recorded a decrease in child sex ratio during the decade 2001 – 2011. Amongst them, maximum decrease has been observed in Mahendragarh district in which decline in child sex ratio is observed of 40 points during the same period. It is also a state which has shown strong evidence of son preference.

Some major causes of decline sex ratio are female foeticide, higher female mortality, dowry, strong son preference, female infanticide and male migration **(*"Awareness of Rural Couples about Sex Ratio"* by Ghosh, Goel and Balda (2005)**.

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Sex ratio of an area directly is related to their condition and status of women in that specific area. If there is imbalance in sex ratio, then it leads to gender discrimination or other major social problems. Further gender discrimination lead to poor health of women, low education status, low work participation rate of women, deteriorating condition of women in all parts of life. If it is wanted that the society moves smoothly for development then sex ratio must be kept balanced. On the other side, the sex ratio of Haryana is the lowest of all the states of India.

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