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Inter-District Variation in Sex-Ratios in Rajasthaii—An Analysis: 1951-91

DEFICIT of women in Indian population, as depicted by the Indian Censuses, has been a long observed phenomenon and undergone considerable debate by the researchers (Kaye 1853; Walker 1856; Visaria 1968; Miller 1981; Dyson and Moore 1983; Quanungo 1960; Fisher and Ifeka 1984) as well as the policy makers from time to time. Although the observed inequality of male and female births (in favour of male infants) is a biological fact, female infants being physiologically more strong, in most of the developed world the situation got reversed and the sex-ratio became favourable to the women. In Indian case, however, the sex-ratio although fluctuating over censuses, still remained in favour of males. It is also interesting to note that except in case of Kerala where sex-ratio has assumed the pattern similar to that of developed countries (favourable to women), in all other states, and India as a whole, the sex-ratio remained in favour of males.

Most researchers argue that there could not have been only one or two isolated reasons for such an observation; but favour a combination of host of the reasons, such as in-accuracy/misstatement, social (e.g. son preference, abortion or infanticide or neglect of female off-spring, omission, early marriage etc.), material (unskilled-midwifery, high mortality among females due to negligence, low food intakes etc.) and geographical (migration etc.) factors that are responsible for continued low sex-ratio in favour of females (Fisher and Ifeka 1984).

In Rajasthan, as in other parts of he country, there has been a preponderance of males over females, i.e. the sex-ratio has always been adverse to women (Table 1). Since 1901 the sex-ratio has never remained static in the state. From 905 and 908 in 1901 and 1911 censuses, it declined to 896 in 1921, probably because of the epidemics which took larger toll of the fair sex. Thereafter a steady increase in ratio was found till 1951 with the ratio spurting to 921. However, in 1961 it again dropped down substantially at the level of 908 for no apparent reasons which recouped a little and rose to 911 in 1971 and to 919 in 1981. The 1991 census figures again recorded a decline in the number of fair sex population as compared to their male counterparts and the ratio now stands at 913.

Chart-1 compares the movement of sex-ratio (female/male x 1000 population) between India and State of Rajasthan over the period 1901-1991. A comparison between the two sex-ratios (all-india and State) over period shows that although the trend has behaved in the

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similar manner, there have been larger fluctuations in the state sex-ratio as compared to that of all-India level.

TABLE 1 : SEX-RATIO 1901-91, RAJASTHAN AND INDIA

Year	*Sex-ratio (F/Mx 1000)*	
	Rajasthan	*India*
1901	905	972
1911	908	964
1921	896	955
1931	907	950
1941	906	945
1951	921	946
1961	908	941
1971	911	930
1981	919	934
1991	913	929

SOURCE : *Census of India, 1981 and 1991.*

Data and Limitations

As discussed there are four broad factors which could affect the sex-ratio:

(i) *differential births*, which could be due to choice or biologically; (ii) *differential deaths*, which could be due to natural, female infanticide or neglect of a particular sex etc.;
(iii) *net migration*, which could be due to preponderance of males, marriages etc.; and (iv) *omission errors at the time of census counts*, which could be intentional or due to negligence etc.

A census-based analysis made by Gupta (1976) revealed that while births and migration contribute positively to the Indian sex-ratio (estimates were 9% and 4% in 1961-71), the deaths (- 75%) and omission in census counts (-12%) together contribute negatively (about 87%) and act as two main factors responsible for observed low sex-ratio in the country.

While at state level some estimates of these factors are available, at district level in most cases hardly any data is available to make a useful analysis. Under the limitations, some poximate variables could be used to explain the phenomenon of existing low sex-ratio (female/male x 1000) in the state as a whole and also at district and regional level. The census provides district level data on decadal population growth rate, population density, female literacy, population distribution by caste and migration, besides on sex- ratio. On the other hand, the Service Statistics makes available the data on couple protection rate (CPR) and other related statistics. District level data on migration and caste have not been published so far for 1991 census. Similarly, no statistics is available on population omission rates during the census counts at district level.

Despite these limitations, an attempt has been made in the present paper to compare the district and regional level differences, existing in the sex-ratios over period, and also to indicate the possible reasons for such observations.

Regional Variations in Sex-ratio

Rajasthan State at present comprises 30 districts (3 of them, namely, Dausa, Rajsamand and Baran have been recently formed and another Dholpur district was formed immediately after 1981 census) with a population of 43.9 million (22.9 million males and 20.9 million females) and spreads over an area of 342,239 sq kms with apopulation density of 128 persons per sq km. The State, in its natural way, could be bifurcated in three ways to analyse the variation in sex-ratios at regional level:

A. *Geographical Divisons*. Geographically the State could be divided into four natural regions, namely, desert, semi-desert, hilly and plain areas. B. *Border/OtherDistricts*. A large part of the State has its border with Pakitsan which is important from the point of view that most of the border districts have high influx of male imigrants. C. *Tribal and Non-tribal Dominated Districts*. Tribals with their special cultural heritage differ significantly from the normal population. Some of the districts in

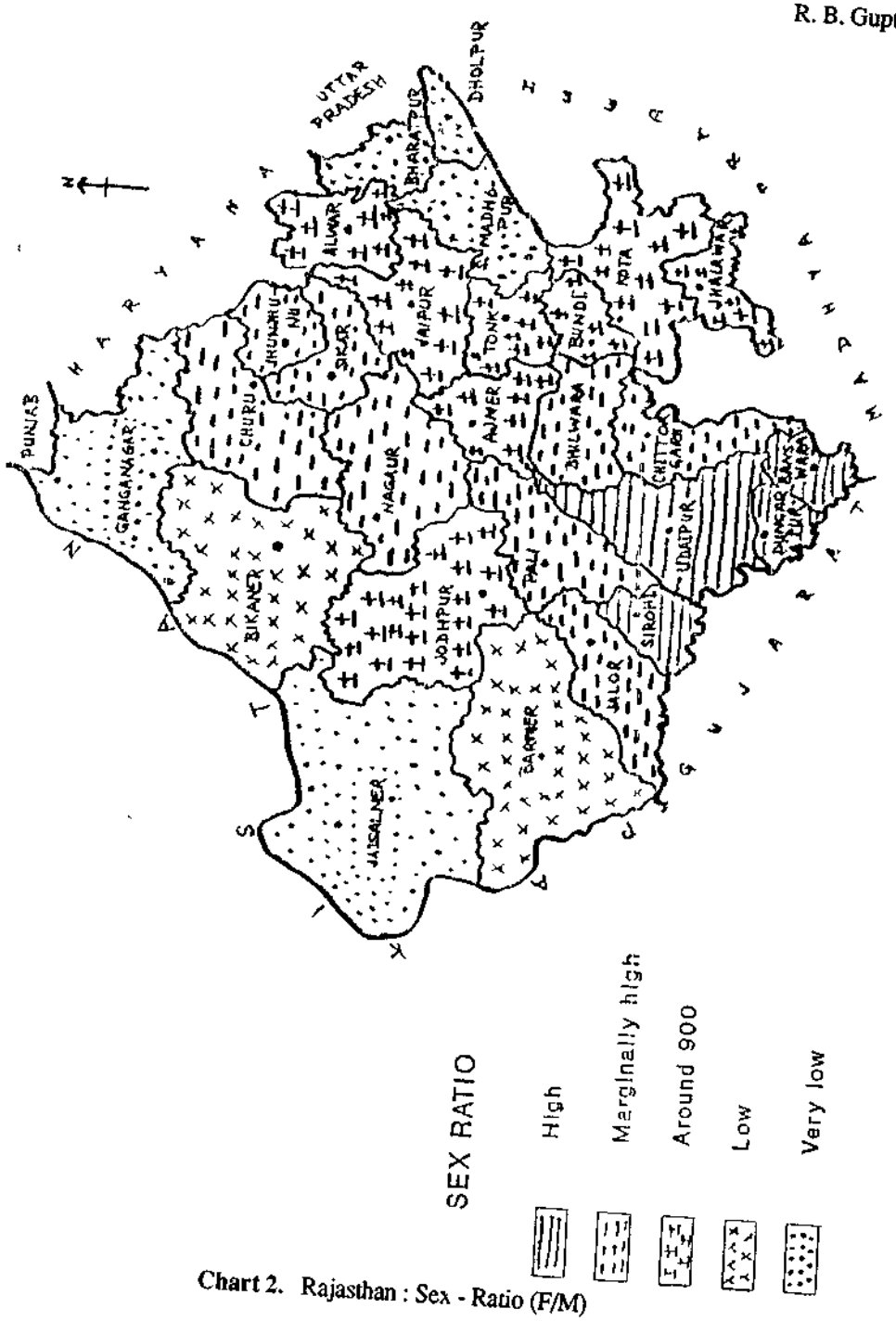

Chart 2. Rajasthan : Sex - Ratio (F/M)

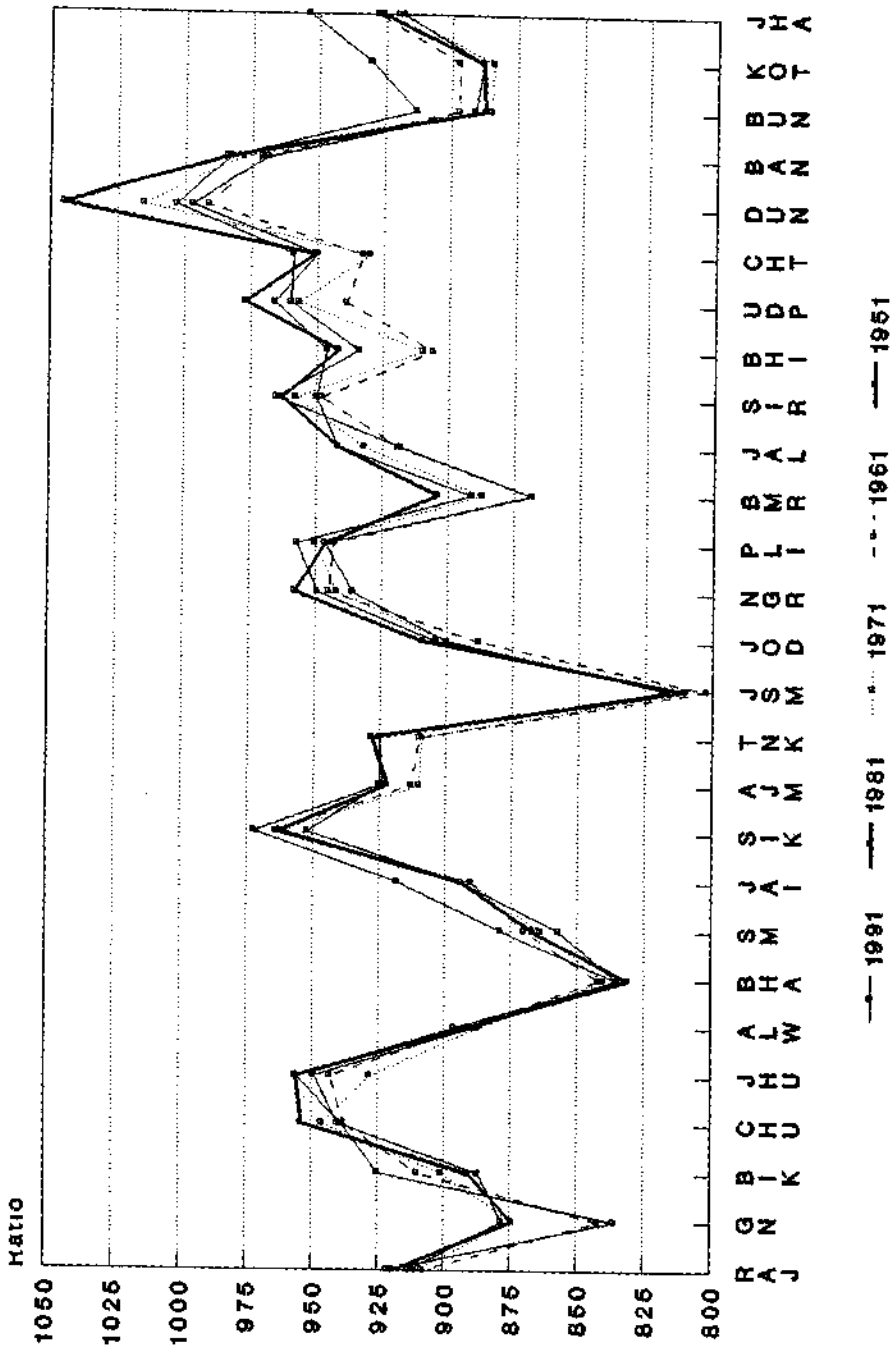

Chart 3. Rajasthan: District-wise Sex-Ratio 1951-91.

the State are tribal dominated and this characteristic has large bearing on observed sex-ratio differential among the districts.

A closer look at the geographical distribution (Chart 2) depicts interesting observations. All the three factors seem playing a crucial role in the observed regional selective low sex-ratios. While tribal-dominated districts like Dungarpur, Banswara, Udaipur and Sirohi clearly distinguished themselves with other districts showing much higher sex-/atios, the bordering districts like Jaisalmer, Barmer, Ganga Nagar and Bikaner registered very low sex-ratios. Low sex-ratios were also found for the districts of Bharatpur and Sawai Madhopur which are bordering the State of Uttar Pradesh. In Central Rajasthan, while semi-desert districts like Churu, Jhunjhunu, Nagaur, Pali etc., registered relatively higher sex-ratios, the plain and more densely populated districts depicted relatively lower sex-ratios.

Before attempting to analyse the reasons for above observations, it is interesting to note that over period (1951 -91), sex-ratios of almost all the districts behaved in the similar manner and there have been the least fluctuations within the district (Chart 3). Appendix-1 also clearly shows that there has hardly been any variation in the district level sex-ratios over the period.

Reasons for Observed Regional Variation

A correlation matrix between some of the possible factors that could affect the variation in sex-ratios among districts was formulated. The variables included are given in Table 2. Although mortality indicator (crude death rate/infant mortality rate or expectation of life at birth) should have been one of the variables to be included among these variables, as stated earlier, due to non-availability of such data, this crucial indicator could not be included in the analysis.

Table 3 clearly depicts a significant positive correlation between tribal population and the sex-ratio which confirms earlier observation. The major reason for such observation is that the son preference among tribals is quite weak and, in most cases, does not exist. The status of women in tribal society is quite high which is responsible for existing equal treatment for both men and the women. In case of migration, it is the family migration which is more common rather than men moving out for earnings among tribals.

The observed negative relationship between population growth rate and sex-ratio on one hand, and also a weak but negative correlation between migration and sex-ratio explains the observed migration phenomenon, especially for the bordering districts. It has also been reported that in desert districts of Rajasthan (most of them also border with Pakistan), female infanticide still exists, especially among the dominant community of Rajputs. This is mainly due to existence of high dowry in these districts. For the same reasons, there is a tendency of neglection as well as under-reporting of female children. According to one report of Pankaj Pachauri in *India Today* of October, 1988, the killing of girl babies is still a widespread phenomenon in some parts of Rajasthan. Among Bhatis (Rajputs), for generations female infants are routinely killed before they see the light of the day outside the mud hovels. The districts which are most affected by this practice include, Jaisalmer, Bikaner, Barmer and Sawai Madhopur (Ghosh 1989). Basically, these are the districts which have the lowest sex-ratios and are affected by both female infanticides as well as influx of migration.

TABLE 2 : VARIABLES CONSIDERED FOR CORRELATION ANALYSIS

District	*Density 1991*	*GR 1981-91 (%)*	*Migration 1971-81 (%)*	*CPR (1988) (%)*	*Sex-Ratio*		*Tribal Pop. 1981 (%)*	*Female Literacy 1981 (%)*
					1981	*1991*		
Rajasthan	128	28.0	-	27.9	919	913	12.2	16.6
Ganga Nagar	127	29.0	+3.35	38.2	874	878	0.3	21.4
Bikaner	44	42.4	-0.54	33.6	891	887	0.2	21.6
Churu	91	30.5	-1.55	29.6	954	940	0.5	13.7
Jhunjhunu	264	29.2	-1.89	32.1	956	949	1.9	20.5
Alwar	273	30.2	-1.01	27.9	892	889	8.1	17.5
Bharatpur	325	26.7	-0.59	25.3	831	835	3.0	15.3
Sawai Madhopur	186	27.2	-1.34	22.1	867	857	22.7	11.7
Jaipur	335	37.3	+1.91	29.0	894	894	11.1	24.8
Sikar	238	33.3	-2.76	27.1	963	952	2.7	15.7
Ajmer	203	19.6	-2.31	32.2	922	924	2.2	28.4
Tonk	135	24.1	-0.11	24.0	928	925	11.8	12.3
Jaisalmer	9	41.3	+2.21	15.7	811	810	4.4	9.0
Jodhpur	93	27.5	-2.24	24.2	909	904	2.4	18.2
Nagaur	121	31.2	-2.37	27.1	958	949	0.2	10.7
Pali	120	16.4	+1.00	26.7	946	957	5.5	14.3
Barmer	50	28.1	-0.49	15.0	904	891	5.1	6.2
Jalore	107	26.4	+0.45	24.5	942	942	8.0	6.2
Sirohi	125	20.5	+1.11	28.8	963	950	23.1	13.8
Bhilwara	152	21.4	-0.06	29.5	942	946	9.3	13.3
Udaipur	167	22.4	-0.23	25.7	977	966	34.3	15.3
Chittorgarh	137	20.2	+2.50	26.1	951	950	18.2	14.2
Dungarpur	232	28.0	+0.43	33.0	945	997	64.4	12.5
Badswara	229	30.2	+0.42	35.7	984	969	72.6	10.6
Bundi	138	25.5	+2.50	24.2	887	891	20.1	12.7
Kota	163	32.1	+3.43	27.0	888	888	14.8	23.7
Jhalawar	154	21.7	-2.03	30.0	926	918	11.7	12.9

Note : In all 26 observations are taken, excluding State figures.

The CPR in this context could be considered as an indicator for socio-economic conditions of the districts. An observed high correlation between CPR and sex-ratio could be an indication that in the districts with better socio-economic background, the female mortality is low and status of women is realtively high.

The observed negative correlation with female literacy is a difficult phenomenon to understand but probably because the overall female literacy in the state is so low that it may not have any impact on the observed sex-ratios.

TABLE 3 : CORRELATION BETWEEN SEX-RATIO AND OTHER VARIABLES

*Variable**	*Sex-Ratio in the Year*	
	1991	*1981*
Population growth-rate *(%)*	-0.4485	-0.3679
Population density (per thousand)	0.1194	0.1254
Tribal population (%)	0.4485	0.5336**
Migration (1971-81) (%)	-0.2148	-0.2423
Female literacy (%)	-0.1012	-0.1482
CPR (%)	-0.4306	0.4100

* Notations have their usual units.
** Significant at .01 level.
Note : Correlation between 1981 and 1991 sex-ratios is 0.9806.

Appendix-2 compares the districts according to different socio-demographic indicators used in the study to formulate the correlation matrices. As observed in case of correlaton coefficients, similar trend is depicted by this table also.

Conclusions

The foregone analysis clearly depicts that district-wise sex-ratios have been behaving in a typical fashion in the State of Rajasthan. There have not been many flunctuations within districts over period. On the other hand, there is a clearcut zone level bias in the behaviour of the sex-ratios. While tribal districts show a positive bias towards females in the population, desert and community domination specific districts indicate existence of female infanticide and low status of women leading to high mortality condition among fair sex.

Migration influx, biased by the male immigrants, has been observed in the border districts of Jaisalmer, Barmer, Bikaner and Ganga Nagar, which incidentally are also the districts where Bhati (Rajputs) community dominates and have a long history of supporting female infanticide and neglect of females, in general. The major reason has been the dowry.

Incidentally, female literacy did not show any influence on the observed district/zone-wise fluctuations in the sex-ratio. The major reason for such observation could be the existence of allround low literacy among females in the state.

The observed positive relationship between contraceptive prevalence rate (CPR) and sex-ratio is an indication of better socio-economic status, which is true for the districts which depicted moderate sex-ratio, throughout the period of observation.

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Appendix-1

DISTRICT DISTRIBUTION **ACCORDING TO SEX-RATIO OVER DECADES, 1951-91**

Range FIM x 1000	*1991*	*1981*	*1971*	*1961*	*1951*
990 +	Dungaipur	Dungarpur	Dungarpur	Dungarpur	Dungarpur
960 - 989	Banswara	Banswara	Banswara	Banswara	Banswara
	Udaipur	Udaipur	Sikar	Sikar	Udaipur
		Sikar			Sikar
		Sirohi			Sirohi
930 - 959	Bhilwara	Bhilwara	Chittor	Chittor	Bhilwara
	Chittor	Chittor	Churu	Churu	Chittor
	Churu	Chum	Jalore	Jhunjhunu	Churu
	Jalore	Jalore	Nagaur	Nagaur	Jhalawar
	Jhunjhunu Nagaur	Jhunjhunu Nagaur	Pali Sirohi	Pal? Sirohi	Jhunjhunu Kota
	Pali	Pali	Udaipur	Udaipur	Nagaur
	Sikar				Pafi
	Sirohi				
900 - 929	Ajmer Jhalawar	Ajmer Jhalawar	Ajmer Jhalawar	Ajmer Jhalawar	Ajmer Jodhpur
	Jodhpur Tonk	Jodhpur Tonk	Jodhpur Tonk	Tonk Bhilwara	Tonk Bikaner
		Banner	Bhilwara	Bikaner	Jalore
			Bikaner	Jalore	Bundi
			Jhunjhunu		Jaipur
870 - 899	Alwar	Alwar	Alwar	Alwar	Alwar
	Bundi	Bundi	Bundi	Bundi	Banner
	Bikaner Ganga Nagar Jaipur Kota	Bikaner Ganga Nagar Jaipur Kota	Ganga Nagar Jaipur Kota Banner	Jaipur Kota Banner Jodhpur	
	Banner				
869 and between	Bharatpur Jaisalmer Sawai Madhopur	Bharatpur Jaisalmer Sawai Madhopur	Bharatpur Jaisalmer Sawai Madhopur	Bharatpur Jaisalmer Sawai Madhopur Ganga Nagar	Bharatpur Jaisalmer Sawai Madhopur Ganga Nagar

Appendix - 2

DISTRIBUTION OF DISTRICTS ACCORDING TO VARIOUS SOCIO-DEMOGRAPHIC INDICATORS

Sex-ratio (1991)	*Growth Rate (1981-91) (%)*	*Population Density (1991)*	*Migration (lfol-81)*	*Couple Protection Rate (1988)*	*% Tribes (1981)*	*Female Literacy 1991 (%)*
990 +	*40 and above*	*250 +*	*-2 and below*	*35 +*	*60 and more*	*25 +*
Dungarpur	Bikaner, Jaisalmer	Jaipur, Bharatpur, Alwar, Jhunjhunu	Churu, Jodhpur, Jhunjhunu, Nagaur, Alwar, Jhalawar, Sikar, S. Madhopur, Ajmer	Ganga Nagar Banswara	Banswara Dungarpur	Ajmer
960 - 989	*35-39*	*201-250*	*-1-0*	*31-34*	*48-59*	22-25
Banswara Udaipur	Jaipur	Sikar, Dungarpur, Banswara, Ajmer	Bikaner, Bharatpur, Tonk, Banner, Bhilwara, Udaipur	Bikaner Jhunjhunu Ajmer Dungarpur		Ganganagar Bikaner Jaipur Kota
930 - 959	*30-34*	*151-200*	*0-0.9*	*27-30*	*36-47*	*18-21*
Pali, Sikar Sirohi, Chittor, Jhunjhunu, Nagaur, Bhilwara Jalore, Churu	Churu. Alwar Sikar, Nagaur Banswara, Kota	Sawai Madhopur Udaipur, Kota, Jhalawar, Bhilwara	Jalore Dungarpur Banswara	Churu, Jhalawar, Alwar, Bhilwara, Jaipur, Sirohi Sikar, Nagaur		Jhunjhunu, Jodhpur
900-929	*25-29*	*101-150*	*1-1.9*	*23-25*	*24-35*	*14-17*
Tonk, Ajmer, Jhalawar, Jodhpur	Ganga Nagar, Jhunjhunu, Bharatpur, Bundi S. Modhopur, Jodhpur, Banner, Jalore, Dungapur	Bundi, Chittor, Tonk, Sirohi, GangaNagar, Nagaur, Pali, Jalore	Jaipur PaH Sirohi	Bharatpur,. Tonk, Jodhpur, Pali, Jalore, Udaipur, Chittor, Bundi	Udaipur	Alwar, Bharatpur, Sikar, Pali, Udaipur, Chittor
870-899	*20-24*	*51-100*	2-2.9	*19-22*	*12-23*	*10-13*
Jaipur, Banner, Bundi, Alwar, Kota, Bikaner, Ganga Nagar	Tonk, Sirohi, Bhilwara, Udaipur, Chittor, Jhalawar	Jodhpur, Churu	Jaisalmer Churu Bundi	Sawai Madhopur	Bundi Chittor Kota S. Madhopur Sirohi	Churu S. Madhopur Tonk, Nagaur, Sirohi, Bhilwara, Dungarpur, Banswara, Bundi, Jhalawar
869 and below	*29 and below*	*50 and below*	*3 and more*	*18 and below*	*0-11*	*Below 10*
Bharatpur S. Madhopur Jaisalmer	Ajmer, Pali	Banner, Bikaner, Jaisalmer	Ganga Nagar, Kota	Jaisalmer Banner	Rest of the Districts	Jaisalmer Banner Jalore'