

**CHANGES IN SEX-RATIO IN INDIA WITH SPECIAL
REFERENCE TO URBAN AREAS : 1901-1991**

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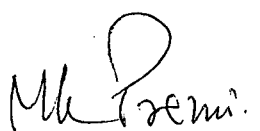


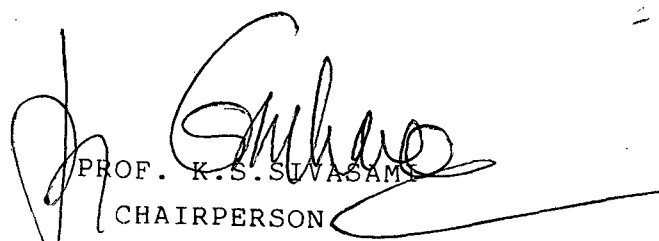
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TO WHOMSOEVER IT MAY CONCERN

This is to certify that this dissertation entitled "Changes in Sex Ratio in India with Special Reference to Urban Areas: 1901-1991", submitted by Hansvir Singh in partial fulfilment of the requirements for the award of the degree of Master of Philosophy is a bonafide work to the best of my knowledge and may be placed before the examiners for evaluation.


PROF. M.K. PREMI
SUPERVISOR


PROF. K.S. SUVASAMA
CHAIRPERSON

DEDICATED TO MY FATHER

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INTRODUCTION

INTRODUCTION

The sex composition of a population is the most basic of all demographic characteristics and plays a vital role in population analysis since it affects directly the incidence of births, deaths and marriages. Migration rates, occupational structure and virtually all other population characteristics may be influenced by the ratio between the two sexes.¹ In addition, the development of a region also affects the sex comparison of the population of that area.² In sharp contrast to developed countries India like few other developing nations is characterized by a considerable deficiency of females in its population.³ Sex ratio is the basic index commonly used for characterizing the composition of population. The ratio serves to indicate relative proportion of the male and female components of a given population. It is conventionally defined either as number of females per thousand males or internationally as number of males per hundred females. In the present study,

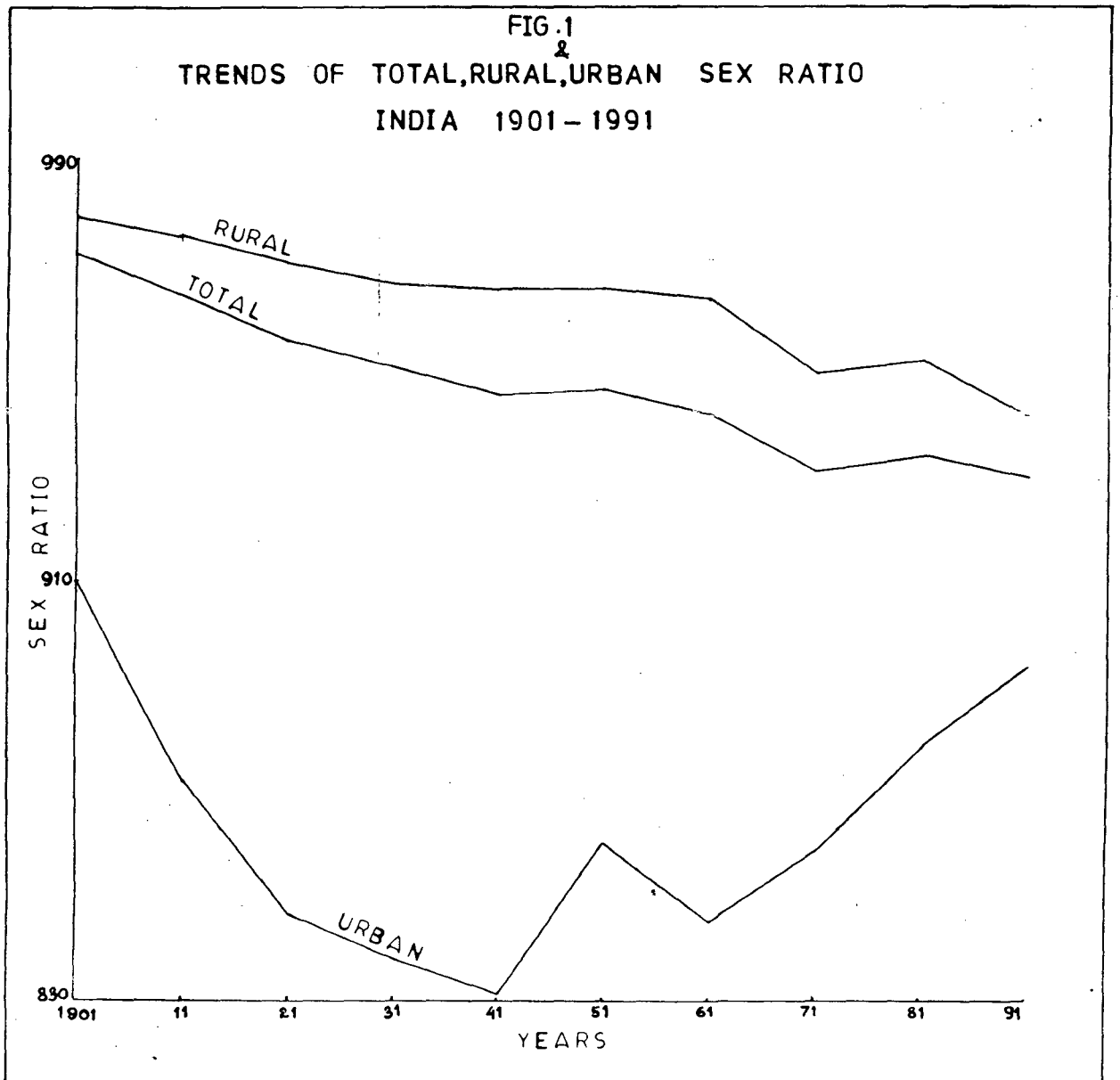
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1. United Nations "Determinants & Consequences of Population Trends", United Nations Publications, vol.I, 1974, p.262.
 2. M.K. Jain, "Regional development and the sex composition of population in India", Journal of Social & Economic Studies, vol.III, no.2, 1975, p.314.
 3. R.C. Chadhna, "Balancing the Population", Tribune, Chandigarh, 14 July 1991.

females per 1000 males, census definition has been taken into consideration.⁴

The 1991 Census of India has confirmed the worst fears of women's groups regarding the decline in sex ratio. It has not only revealed that the sex ratio in India's population has declined further but has proved by implication that development policies till now marginalised women so effectively that they have suffered even in proportion of total population.⁵

Census 1991 tells that there are only 928 females for per 1000 males in the country.⁶ The sex ratio right from the beginning of this century, when the head count was introduced in India, has always been unfavorable to women. We began in 1901 with 972 females per 1000 males. By 1911 the number of women to every 1000 men had gone down to 964 and by 1971 it had dipped to 930. However, the 1981 census counted 933 women to every 1000 men and raised hopes that gender imbalance had finally been put on a correctional

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4. Census of India, 1991, Provisional Population Totals, Paper I of 1991, Registrar General and Census Commissioner of India, New Delhi.
 5. Anjali Deshpande, "Census underlines Anti-women's Bias", Telegraph, Calcutta, 24 May 1991.
 6. Census of India 1991, Ser. I-India, Paper 1 & 2 of 1991, Provisional Population Totals, ORGI, New Delhi.



path.⁷ Those hopes now have been dashed. The 1991 census has proved to be an aberration. In 1901 urban sex ratio was 910, it reached a low of 831-834 in the decade 1931-41 and again moved up, to reach 893 in the year 1991.

The trend of sex ratio for total population and urban population has been plotted on the line graph, which show continuous decline in the sex ratio for total population and a slope downward but in urban sex ratio (USR) the line graph has 'U' shape where sex ratio declines till 1941 and again it goes upward (Figure-1, Table No.1).

7. Census of India 1981, Sr. I, Part II A(ii), General Population Tables, ORGI, New Delhi.

Table No.I - Sex ratio for Total, Rural and Urban population, India 1901-1991.

Year	Total	Urban	Rural
1901	872	810	979
1911	864	872	975
1921	955	846	970
1931	950	838	966
1941	945	831	965
1951	946	860	965
1961	941	845	963
1971	930	858	949
1981	933	878	951
1991	929	893	941

Source: 1. Census of India 1981 Ser. (i) Pt. IIA (ii) General Population Tables ORGI, New Delhi.

2. Census of India 1991, Paper 2 of 1991. Provisional Population Totals, ORGI, New Delhi.

After looking at the total sex ratio and USR for India, it can be compared with other countries of the world. To make comparison more practical only countries with population of one crore and above have been taken for this comparison. These countries have also been classified in to more developed and less developed. It has been observed that with regard to sex composition the distinction between

the developed world and less developed world is not that markedly sharp as it has been with mortality and fertility. The most developed continent of North America and most backward continent of Africa display preponderance of females over males. Interestingly, in both these cases the sex comparison is the product of high mortality rate among males in the two continents may result from contrastingly different factors. The death of males in case of Europe including Russia may well be seen as the legacy of second world war which took a heavy toll of young men in the region.⁸ Some countries of Asia show a paucity of females and their population have more males than females. This is largely associated with relatively high mortality rate among the females of Asian countries due to the neglect of females at all ages and relatively low status granted to them.⁹ In case of Vietnam and Myanmar, sex ratio is high due to the internal disturbances which took heavy toll of males, (Table No.2).

8. R.C. Chandna, "A Geography of Population", Kalyani Publishers, New Delhi, 1986, pp.132-144.

9. *ibid.*, pp.132-144.

Table No.2 - Sex ratio in selected countris of the World
Population

Country	Year	Sex ratio
More developed		
Canada	1986	1027
Mexico	1980	1023
U.S.A.	1980	1058
Argentina	1980	1031
West Germany	1987	1082
Italy	1981	1056
Poland	1978	1053
Romania	1977	1028
Spain	1981	1037
U.K.	1981	1059
Yugoslavia	1981	1023
U.S.S.R.	1989	1116
Japan	1985	1034
Less developed		
Brazil	1980	1009
Colombia	1986	1020
Bangladesh	1981	939
China	1982	931
Iran	1986	955
Republic of Korea	1985	998
Myanmar	1983	1015

Country	Year	Sex ratio
Pakistan	1981	904
Philippines	1980	993
Thailand	1980	1007
Turkey	1985	973
Vietnam	1989	1056
Egypt	1986	955
Ethiopia	1984	1006
Morocco	1912	997
Nigeria	1963	980
S. Africa	1985	1025
Sudan	1983	969
Zaire	1984	1012
India	1981	933

Source: Demographic Year Book 1989, United Nations Publication, New York, Issue No.41, 1991.

(ii) The Research Problem: Rationale for its Selection:

A knowledge about the distribution of population between the two sexes is a fundamental question in understanding a community to which it relates. Residence, age and sex ratio constitute the three primary lines of research in any demographic study. The regional and temporal changes in sex ratio of a population explain the

socio-economic condition of that region. There is an overall deficiency of females in India's population. But urban areas have low sex ratio in comparison to total sex ratio, and it is not uniform over the country. It varies from region to region. In highly industrialized regions of India it is very low, which may be due to male selective migration. Even the sex ratio in different size of cities presents the variation. The general trend is that, as the size of the city increases, sex ratio declines and vice versa.

As the urban sex ratio is lower than the total sex ratio since the beginning of the century and it has shown improvement after 1961, but total sex ratio has shown decline. There are regional variations in urban sex ratio. This phenomenon is very puzzling. Why there are regional variations in USR? Why sex ratio is low in big cities? Is it due to the neglect of females in society? What are the factors which are responsible in the improvement in USR? All these questions made this area interesting for probe.

(iii) Literature Survey

It has been indicated by several writers that sex ratio of a population is dependent on five factors namely -
(i) Sex selective migration, (ii) Sex ratio at birth, (iii) Sex differentials in mortality, (v) Under-enumeration of

females and (v) Socio-economic factors.

The manner in which these factors affect sex ratio is discussed below:

Sex selective migration

Migration can be taken separately for international and internal.

In case of India, where the international migration is negligible, it cannot affect the sex ratio. There is no evidence at all of female selective emigration or male selective immigration of a magnitude which can affect sex ratio.¹⁰ Mani has also analysed the impact of return migrants on sex ratio in Kerala during Gulf War which took place before census exercise and he concluded that it did not affect the sex ratio of Kerala.¹¹

Number of international migrants in India had always been insignificant compared to its population and its impact on India sex composition had been negligible.¹²

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10. M.K. Premi, "India's Population: Heading Towards a Billion", B.R. Publishing Corporation Pvt. Ltd., Delhi, 1991, p.38.
11. V.R.Mani, "Kerala: Ills of more women to men", Times of India, New Delhi, 21 April, 1992.
12. S.C. Gulati, "Balancing the Sex ratio in India", Financial Express, Bombay, 15 December 1991.

As the study is based on urban population sex ratio, internal migration plays a vital role in explaining the low USR. According to Dubey, "The lower sex ratio in urban areas suggests the migratory character of the population. Generally, the male population of the villages migrate to the cities, although temporarily in most cases, in search of employment and means of livelihood, other than agriculture, to supplement the family income. Females are generally left behind in the villages to look after the odd jobs at home."¹³ Explaining the lower sex ratio in Chandigarh, Chandna says, "This is the solitary example where the migratory pattern may have been more relevant than any other factor in explaining its striking deficiency of females. Most of the migrants, who migrated to Chandigarh have their families behind in their native place due to the uncertainty of the employment and high cost of living."¹⁴

As Gulati put forward that, "Generally migrational streams are age and sex selective. Since, initially, there are adult males who migrate in search of better economic opportunities and may be followed by other family members at later dates. Thus large scale migration of male workers

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13. R.M. Dubey, "Population Dynamics in India, Chugh Publication, Allahabad, 1981, p.120.
14. R.C. Chandna, "Balancing the Population", Tribune, Chandigarh, 14 July, 1991.

certainly affects the sex composition at both the places of origin and destination."¹⁵

Preponderance of male numbers in rural to urban migration lies in the fact that it is generally the male section of the population that is 'pushed out' from rural areas in search of employment and better opportunities and this phenomena is found in most of the developing countries.¹⁶

Joshi, who ^{after} analysing the NSS data (1955-58), says, "larger the city, the lower the sex ratio in migration streams. There are also regional differences to consider which sex ratio tend to be much lower in big cities than in smaller urban areas in the north, they are much more even in cities of all sizes in south India."¹⁷

The four developed states - Gujarat, Karnataka, Tamilnadu and Maharashtra have also recorded declines in the number of females in comparison to 1981, although the magnitude of decline is relatively low - four point. The

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15. S.C. Gulati, "Declining Sex ratio in India", Financial Express, Bombay, 14 July, 1991.
 16. V.C. Sinha & E. Zacharia, "Elements of Demography", Allies Publishers Pvt. Ltd., New Delhi, 1984, p.282.
 17. Heather Joshi, "Prospects and case for employment of women in Indian Cities", Economic & Political Weekly, 11, 1976, pp.1303-1308.

decline could partly be due to continuance of male selective immigration to their urban areas from the less developed states.¹⁸

According to Gosal, "There is a less sex selectivity in migration to urban areas in South India, probably because here the women enjoy a better status in the society than in most other areas of the country. Also, the cottage industries which are important in south India towns offer some employment to the females. The rural-urban differential in sex ratio is the lowest in South India."¹⁹

After reviewing the literature related with rural to urban migration in India, it can be concluded that marked variation in sex ratio of urban population in India is predominantly due to sex selective migration pattern. As the employment opportunities for women in organised sector are not available in comparison to men, and social-cultural factors do not allow females to migrate alone, this lead to imbalance in rural-urban migration stream.

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18. Amitabh Kundu & M.K. Sahu, "Variation in sex ratio: Development Implications", EPW, Oct.12, 1991.
 19. G.S. Gosal, "The Regionalism of sex composition of India's Population", Rural Sociology, 26:2, June 1961, p.126.

Sex ratio at Birth

A statistical study of sex ratio at birth registered in 75 territories with a relatively complete vital registration has confirmed the widely held belief that the masculinity ratio at birth varies between 104 and 107. In Negroid population, there is a tendency for the sex ratio at birth to vary between 102 to 103.²⁰

Cohen and Glass found significantly low sex ratio among offsprings of mothers of blood group A and high sex ratio among the offsprings of mothers of blood group B²¹ A different study conducted in Melbourne and Perth, however, failed to establish the above hypothesis of relationship between the ABO blood group and sex ratio at birth.²²

The sex ratio at birth generally varies between 104 to 107 per 100 females. This variation may be due to the genetic factors i.e. associated with blood group, according to the A.B.O. classification. Second factor is the parity

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20. Pravin M. Viseria, "Sex ratio at birth in territories with a relatively complete registration", Eugenics Quarterly, vol.14, no.2, June 1967, pp.132-42.
21. B.H. Cohen and B. Glass, "The ABO Blood Groups and Sex Ratio", Human Biology, vol.28, Feb 1956, p.39.
22. J.W. Shield, R.L. Kirk & R. Takobowicz, "The ABO blood groups and masculinity of offsprings at birth", American Journal of Human Genetics, vol.10 (2), 1958, pp.154-163.

distribution of the births. Other factors usually include improved nutrition and health condition, lower rate of still birth ratio and differences in abortion rates generally act in the direction of increasing masculinity at birth.²³ In India, 108 males birth take place to 100 females in comparison to 105 males birth to 100 female in Europe.²⁴

Gulati says, "...wide spread use of amniocentesis is contributing towards the declining sex composition of population through the unnatural increase in sex ratio at birth must be checked."²⁵ Same views are given by Chandna²⁶ and Sundaram.²⁷

As the presex determination techniques have been introduced to some extent in India, it led to the abortion of the female foetus in particular. This has affected the

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23. B.K. Dutta, "Changes in the sex ratio in ECAFE Countries", Journal of Family Welfare, XIX, 2 Dec. 1972, pp.45-55.
24. Anjali Desh Pande, "Census underlines anti-women bias", Telegraph, Calcutta, 24 May, 1991.
25. S.C. Gulati, "Declining Sex ratio in India", Financial Express, Bombay, 15 Dec., 1991.
26. R.C. Chandna, "Balancing the Population", Tribune, Chandigarh, 14 July, 1991.
27. J.S. Sunderam (Report), Financial Express, Bombay 22 Oct. 1991.

natural sex ratio at birth by pushing the sex ratio at birth further high.²⁸

Other studies have related the sex ratio at birth with social factors, i.e. the effect of the sex sequence at birth, age of mother and age of father²⁹ and system of polygamy and practice of infanticide.³⁰

Anantharam analysed sex ratio by taking the sex-age structure of India's 1971 population and analysed the changes in sex ratio with changes in sex ratio at birth and with different life tables. First he selected 1891-1901, in which female ratio was higher than male. Second 1921-31 have male and female ratio was some what equal and third male ratio was higher than female and relate to the period of 1961-71. He concluded that with the rise of one point in sex ratio at birth say from 104 to 105, the overall sex ratio declines by 3 points in ten years, by 4 to 5 points in 20 years and by 6-7 points in 30 years where other conditions remain constant. Thus an increase in sex ratio

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28. Swapan Singh, "Evils of Selective Abortion", The Statesman, Delhi, 15 Feb. 1992.
29. Pakrasi Kanti & A.K. Halder, "Sex ratio and sex sequence of birth in India", Journal of Bio-social Sciences, 1972.
30. R.F. Shaw, "The effect of polygamy and infenticide on the sex ratio", American Journal of Physical Anthropology, 19 March 1968.

TABLE NO. 3
TRENDS IN SEX RATIO WITH 1971 AGE COMPOSITION AND DIFFERENT LIFE TABLES.

YEAR	YEAR SEX RATIOS AT BIRTH										
	108 61-71	91-01	107 21-31	61-71	91-01	106 21-31	61-71	91-01	105 21-31	61-71	104 61-71
1971	930	930	930	930	930	930	930	930	930	930	930
1976	925	934	928	926	935	930	928	936	931	929	930
1981	921	937	926	924	939	929	927	942	932	929	932
1986	919	940	922	922	943	925	926	947	929	930	934
1991	916	942	920	920	946	924	925	951	929	930	934
1996	913	943	919	919	949	924	924	954	930	930	935
2001	911	944	919	917	950	925	923	956	931	929	936
2006	910	945	917	916	951	924	923	958	931	930	936
2011	908	945	916	915	952	924	922	960	931	929	937
2016	907	945	916	914	953	923	922	961	931	929	937

CONTI →

YEAR	108		107			106			105		104	
	61-71	91-01	21-31	61-71	91-01	21-31	61-71	91-01	21-31	61-71	61-71	
2021	906	946	915	913	954	923	921	962	930	929	937	
2026	905	946	915	913	954	923	921	963	931	929	937	
2031	904	946	914	912	955	923	920	963	931	929	937	
2036	903	947	914	912	955	923	920	964	931	929	937	
2041	903	947	914	911	956	922	920	965	931	929	937	
2046	903	947	914	911	956	922	920	965	931	929	938	
2051	903	947	914	911	956	922	920	965	931	929	938	
2056	903	947	913	911	956	922	920	965	931	929	938	
2061	903	947	913	911	956	922	920	965	931	929	938	
2066	903	947	913	911	956	922	920	965	931	929	938	

SOURCE: S. Anantharam, Declining Sex Ratio in India 1901-1981, Unpublished Ph.D. Thesis CSRD/SSS
Jawaharlal Nehru University New Delhi 1989.

at birth can at least partly, explain the decline in overall sex ratio (Table No.3).³¹

As Premi put forward his views, "Biologically there are more male conceptions than female conceptions. But, at the same time, there are more male foetal losses (due to instantaneous and voluntary abortions) than those of females. This is established by the data available in this regard. For example, the sex ratio at birth in Sweden around 1786 was 104.3 but by 1986 it increased to 107.2. In United Kingdom the SRB in 1861 was 103.5, it had increased to 107.4 in 1980. In Belgium, the SRB improved from 104.8 in 1900 to 105.8 in 1980 and in France it improved from 104.4 in 1851 to 105.2 in 1980."³²

✓ A recently completed fertility survey in Chandigarh (1990) has revealed 114 male births to every 100 female births.³³

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31. S. Anantharam, "Declining sex ratio in India: 1901-1981", unpublished Ph.D. thesis, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi. 1989.
32. M.K. premi, "India's Population: Heading Towards a Billion", B.R. Publishing Corporation Pvt. Ltd. Delhi, 1991, p.39.
33. K.P. Singh, "Sex ratio in North-western Region: A Sociological Study", unpublished paper presented at XV IASP Conference, Trivandrum, 1991.

On the basis of present literature, it can be concluded that the hypothesis, sex ratio at birth is becoming favourable to male has some bearing on the declining sex ratio in India. But this exercise cannot be carried out for the urban sex ratio due to the non-availability of data and nature of research work.

Differential Mortality

Females are considered to be biologically superior sex, and the higher attrition rate of male foetuses and the higher still birth rate for males stand as evidence of this as does the higher death rate of male children in the developed world. India follows this universal pattern only in the first week or the first month of life, after which the female death rate becomes higher.³⁴

According to Gupta, "The number of girl deaths per 1000 live births upto the age of five years is higher than those of male children. The respective numbers are 172 and 160 in rural areas and 98 and 92 in cities - figures based on 1981 census."³⁵

34. Shanti Ghosh, "Born to Die", Statesman, New Delhi, 24 November 1985.

35. Y.P. Gupta, "A Dangerous Trend", Financial Express, Bombay, 25 August 1991.

Some sociologists and demographers have given the explanation for declining sex ratio that the female mortality is much higher than the male and the differential has increased instead of narrowing down.³⁶

More females die in India at the stage of infancy as well as during the reproductive period. The general neglect of females is largely responsible for high female mortality at childhood. Similarly, frequent confinements to bed due to high fertility may have the explanation for higher mortality during the reproductive period.³⁷

A study was conducted by Visaria among the Indians, who are residing abroad. He found that the sex differentials in mortality is still prevalent among those Indians, despite the fact they are living in different cultural setting.³⁸

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36. Report, The Hindustan Times, New Delhi, 16 May, 1991.
37. R.C. Chandna, "Balancing the Population", Tribune, Chandigarh, 16 May 1991.
38. Pravin M. Viseria, "The sex ratio of the population of India", 1961, Monograph No.10, Registrar General of India, New Delhi.

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Sex differentials in over all mortality and in age-specific mortality and their changes over time are the major factors affecting the sex ratio of a 'closed' population.³⁹

The female death rate which was lower than the male death rate in 1891-1901 became higher in 1901-11 and remained higher in 1984 except the year 1980 and in 1988 it became equal to male death rate (Table No.4).⁴⁰

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39. B.K. Dutta, "Changes in sex ratio in ECAFE countries", Journal of Family Welfare XIX:2, 2 December 1972, pp.45-55.
40. M.K. Premi, "India's Population: Heading Towards a Billion", B.R. Publishing Corporation Pvt. Ltd., Delhi, 1991, p.41.

Table No.4 Estimated Decadal male and female death rates:
India 1901-1988

Year	Male	Female	F-M
1901	50.4	49.9	-0.5
1911	46.6	48.2	+1.6
1921	52.8	53.5	+0.7
1931	35.2	37.7	+2.5
1941	27.2	29.4	+2.2
1951	28.8	30.2	+1.4
1961	20.5	23.4	+2.9
1971	17.3	18.6	+1.3
1975	15.5	16.3	+0.8
1980	12.4	12.4	0.0
1981	15.0	15.2	+0.2
1984	12.4	12.8	+0.4
1988	11.0	11.0	0.0

Source: M.K. Premi: India's Population: Heading towards a Billion. B.R. Publishing Corporation Pvt. Ltd., Delhi, 1991, p.41.

Premi has analysed the pattern of infant and child mortality between the period of 1951-1985 by comparing the nqx values (Table No.5). He concluded the infant mortality

Table 5: The Male and Female nq_x values for 1981-61, 1961-71, from the Census Life Tables, and for 1970-75, 1976-80 and 1980-85 from the SRS Life Tables, India.

Year	nq_x	Male	Female	Ratio (F/M)
1951-61	$1q_0$	0.15322	0.13826	0.902
	$4q_1$	0.08353	0.10023	1.200
	$5q_5$	0.03091	0.03788	1.225
1961-71	$1q_0$	0.13013	0.12837	0.986
	$4q_1$	0.06777	0.07557	1.115
	$5q_5$	0.03506	0.05066	1.445
1970-75	$1q_0$	0.12998	0.13505	1.039
	$4q_1$	0.07567	0.10301	1.361
	$5q_5$	0.02266	0.02613	1.153
1951-61	$1q_0$	0.12100	0.12720	1.051
	$4q_1$	0.06774	0.08992	1.327
	$5q_5$	0.01815	0.02266	1.248
1980-85	$1q_0$	0.10416	0.10415	1.000
	$4q_0$	0.05337	0.07290	1.366
	$5q_5$	0.01637	0.02026	1.238

Source: M.K. Premi, India's Population: Heading Towards A Billion
B.R. Publishing Corporation Plot Ltd., Delhi, 1991. pp 42.

became unfavourable to females, but for the other age-groups pattern is not clear.⁴¹

Regarding the age-specific mortality ratio, Mitra has analysed data and calculated the ratio between age-specific mortality rate of males to age-specific mortality rate of females for the period of 1941-50, 1951-60 and 1961-70 (Table No.6). He concluded that the neglect of female child specifically below age nine and their increasing trend of neglect from 1940-50 to 1961-70 led to high female mortality.⁴²

Dandekar says that sex differentials in mortality is due to the differential treatment of female child at every step.⁴³

The possible causes for relatively higher female mortality in India often discussed in census reports include female infanticides, greater neglect of females especially at the earlier ages, early marriage and cohabitation, frequent child bearing associated with unskilled midwifery,

41. *ibid.*, p.42.

42. Asok Mitra, "India", Population: Aspects of Quality and Control, vol.2, Abhinav Publications, New Delhi, 1978, p.380.

43. Kumudini Dandekar, "Why has the proportion of females in India's population declining?" EPW X: 4, October 18, 1975.

poor nutrition, housing and sanitary conditions and hard work for females particularly in the lower income groups.⁴⁴ Also there is a little evidence to support the view that there is deliberate neglect of female babies despite the fact there may be preference for male children.⁴⁵

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44. Population of India, "Country monograph series No.10, ESCAP, United Nations Publication, Bangkok, 1982, p.73.
45. P. Padamanabha, Census of India, 1981, Provisional Population Totals, Paper I of 1981, ORGI, New Delhi, p.35.

Table No.6 Ratio of Age-specific mortality rates for males to Age-specific mortality rates for females, All India: 1941-50, 1951-60 and 1961-70.

Age	1951	1961	1971
0	1.09	1.11	1.04
1	0.76	0.83	0.84
2	0.74	0.83	0.73
3	0.76	0.82	0.76
4	0.80	0.82	0.83
5	0.83	0.81	0.74
6	0.86	0.81	0.73
7	0.89	0.81	0.72
8	0.92	0.27	0.74
9	0.96	0.83	0.81
10	1.00	0.86	0.88
15	1.27	0.94	0.79
20	1.34	0.95	0.72
25	1.05	1.00	0.84
30	0.84	0.63	0.93
35	0.80	0.64	0.91
40	0.83	0.79	0.82
45	0.91	0.92	0.90
50	1.03	0.99	1.03
60	1.15	1.09	1.09
70	1.18	1.17	1.03

Source: Asok Mitra; India's Population: Aspects of Quality and Control. Vol.2, Abhinav Publications, New Delhi 1970, p.380.

✓ In urban areas in 1987 in the age-group of 10-14, males had higher death rate of 1.1 per thousand compared to 0.9 per thousand for females. But in 15-19 age-group, while the death rate for males increased only marginally to 1.20 per thousand, but the mortality rate of females doubled to 1.8 per thousand. It does seem curious that after attaining puberty more females die than males.⁴⁶

Gulati says, "... the expectation of life at birth for females becomes higher than males in improved mortality conditions. It is quite possible that initial improvements in mortality conditions may benefit males more than females because of strong son preference and male domination in the society. However, improvements in crude death rate beyond the threshold value i.e. 9; seems to benefit females more than males and becomes unfavourable to males."⁴⁷

✓ Dyson and Moore have also established in their study that the main reason for the relatively low sex ratio in north especially Punjab and Haryana is due to the

46. Anjali Desh Pande, "Census underlines anti-women bias", Telegraph, Calcutta, 24 May 1991.

47. S.C. Gulati, "Declining sex ratio in India", Financial Express, Bombay, 15 December 1991.

practice of discrimination against females in access to food and medical care.⁴⁸

Bhatia worked out index of son preference for India and he found that it is much stronger in North India especially Punjab and Haryana in comparison to South India.⁴⁹

Krishnamoorthy and Padmini concluded that the excess of female infant mortality over male infant mortality is one of the important causes for the deterioration in sex ratio between 1981-91. But again they say that these results are contradictory as the Sample Registration System data suggests a declining trend in female excess in infant mortality.⁵⁰

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48. Tim Dyson & M. Moore, "Kinship, structure, female autonomy and demographic behaviour in India", *Population and Development Review*, vol.9, no.11, 1983.
49. J.C. Bhatia, "Ideal number and sex preferences of children", *The Journal of Family Welfare*, vol.XXIV, no.4, 1978.
50. S. Krishnamoorthy & I.K. Padmini, "An exploration into the change in sex ratio between 1981-1991 in India and determinants of change", unpublished paper, presented at XV IASP Conference, Trivandrum, December, 1991.

As several studies show that the sex differentials in mortality becoming low, the hypothesis that declining sex ratio is due to the sex differential in mortality is not supported for the present but past differentials legacy may be one of the reason for this explanation. These differentials are found in different parts of the country which is due to the different socio-economic reasons. It will be taken into consideration with the socio-economic factors.

Females Undercount

Since 1901, there has been doubt about the under-enumeration of females but prior to 1951, there was no post enumeration check, consequently there is no definite evidence at all which can establish that there has been relatively larger and larger omission of females in successive censuses. In fact their enumeration has somewhat improved over time.⁵¹ Census officials believe that the tendency towards differential female undercount was reduced substantially in later censuses in comparison to earlier, particularly after 1931 with the abandonment of the one

51. M.K. Premi, et al, "An Introduction to Social Demography", Vikas Publishing House Pvt. Ltd., New Delhi, 1983, p.42.

night enumeration.⁵² Premi has analysed the estimates of percentage of undercount by sex derived for the post-enumeration checks of 1951, 1971 and 1981, indicate that the differential between the male-female undercount has not widened (Table No.7). As the post-enumeration check for 1961 did not tabulate the extent of undercount by sex, so it cannot be said that female Undercount increases from 1961 to 1971 although there was deterioration in the total count from a net undercount of 0.8 per cent in 1961 to 1.7 per cent in 1971.⁵³

Sundaram says that in 1991, decline in the sex ratio may be due to greater underenumeration of females comparison to previous census.⁵⁴

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52. M.K. Premi, "The Demographic situation in India", Papers of the East-west Population Institute, no.80, Hawaii, February 1982, p.20.
53. M.K. Premi, "India's Population: Heading Towards A Billion", B.R. Publishing Corporation Pvt. Ltd., Delhi, 1991, p.43.
54. J.S. Sunderam (Report), Financial Express, Bombay 22 October 1991.

Table No.7 Sex Differential in underenumeration as revealed by Post-Enumeration checks.

Year	Extent of underenumeration/1000 Population		Relative index of undercount (F/M)
	M	F	
1951	8.6	11.2	1.30
1971	15.3	18.3	1.20
1981	17.1	18.9	1.11

Source: M.K. Premi: India's Population: Heading towards a Billion. B.R. Publishing Corporation Pvt. Ltd., Delhi, 1991, p.43.

As this shows, hence, the hypothesis of increasing female undercount to explain the declining sex ratio has no substantive evidence.

Socio-Economic Factors

Here an attempt has been made to discuss the main factor i.e. neglect of female in every sphere of life, which has been supported by various writers. Neglect of female is related with the low status of female in comparison to male in a society.

In fact women's status is a wider concept, which has been defined by various authors in various ways. Ruth Dixon has defined women's status, "As the degree of women's access

to (and control over) material resources (including food, income, land and other forms of wealth) and to social resources (including knowledge, power and prestige) within the family, in the community and in society at large. It is measured *de facto* rather than *de jure*, both in absolute terms and relative to men."⁵⁵

Boserup concluded that women's status declines with decline in their productive roles during the transition from rural to urban industrial economy based on wage labour because their i) family obligations which make them less mobile than their male counterparts, ii) occupational choice is more narrowly limited by custom, iii) educational and training aspects are less as compared to men, and iv) even with these handicaps they face discrimination in recruitment.⁵⁶

Gulati has found a positive correlation between sex ratio and female age at marriage in most of the states except Orissa, where in that case it was explained that in a way easily availability of opposite sex for marriages

55. Ruth Dixon, "Rural women at work", John Hopkins University Press, Baltimore, 1978, p.6.

56. E. Boserup, In preface to, "Women and National Development: The Complexities of Change", (ed.), Willeseley Editorial Committee, University of Chicago Press, Chicago, 1978.

reduces the tension among people of both sexes to marry early or late and consequently people of both the sexes try to marry late subject to other social and economic environment.⁵⁷

Gosal when analysing the sex ratio pattern in India argued that the low sex ratio in North-West India is due to the presence of patriarchal system and on the other hand in Peninsular India, where the status of female in the society has been comparatively respectable throughout the past, female ratio is fairly close to a balance.⁵⁸

Gulati, when analysing the status of women, concluded that, there is a practice of restricting women to low paid jobs and denying them access to better paid positions which are reserved exclusively for men. A subtler form of discrimination is that in whatever jobs to which women have access, they are employed for smaller hours, days or weeks, so that the quantum of work is considerably less than that available to men.⁵⁹

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57. S.C. Gulati, "Impact of literacy, urbanization and sex ratio on age at marriage in India", Artha Vijnana, 11:4, December 1969, pp.685-97.
58. G.S. Gosal, "The regionalism of sex ratio composition of Indian population", Rural Sociology, 26-2, June 1961, pp.122-37.
59. Leela Gulati, "Sex discrimination in work and wages", Social Scientist, 4: 4&5, November-December 1975.

Due to the low status of females, males do not bother much about them in sharing the excessive burden of work even during the child rearing.⁶⁰

Lack of education, low employability, excess child bearing, poor health services and cheapness of female lives, all these factors are responsible for the declining sex ratio.⁶¹

As the sex ratio above 22°N latitude is low and below it is comparatively high, in this case sociological factors may be responsible.⁶²

The declining sex ratio is indicative of the discrimination and deterioration in the living condition, that women are subject to, in Indian society. The selective pre-natal abortions common in many Indian cities almost skew the sex ratio. Tikku quoting to Amartya Sen says, "women

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60. K. Dandekar, "Why has the proportion of women in India's population been declining?", EPW X:4, October 18, 1975.
61. Asok Mitra, "India's population: Aspects of quality and control", vol.I, Abhinav Publications Pvt. Ltd., New Delhi, 1978, pp.396-97.
62. M.K. Premi, The Hindustan Times, New Delhi, 31 March 1991.

had a higher survival rate in societies where they tended to be employed in gainful employment outside the home.⁶³

Viswanathan says that decline in the ratio is partly due to the declining nutritional and health standards of women as compared to those of men.⁶⁴

The World Bank underlines the urgent action by the government and by society to save India's women from dying at higher rate than men due to malnutrition and inadequate health care compared to men. Risk of an Indian woman dying from a maternity related cause is about 200 times greater because she faces five or six pregnancies compared to two or fewer for a woman in a developed country.⁶⁵

Explaining the low sex ratio Nanda says, "one of the reasons among others is preference for male children resulting in neglect of female babies, relative gap in the health conditions between male and female."⁶⁶

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63. M.K. Tikku, (Report) The Hindustan Times, New Dlehi, 11 April 1991.
64. Prem Viswanathan (Report) Times of India, New Delhi, 31 December 1991.
65. Financial Express, Bombay (World Bank Report Analysis), 21 November 1991.
66. National Herald, New Delhi (Report), 27 March 1991.

The declining trend in sex ratio shows that the old social attitudes towards the girl child and women have not changed.⁶⁷

Neglect of female is still persists because male being the principal bread winner in the Indian social system has given more value than the female.⁶⁸

/The declining sex ratio is due to the preference for son, resulting in neglect of female children, the relative gap in health condition, lower expectation of life at birth for females in the past compared to males.⁶⁹

From the inherent violence in denial and suppression to the more sensational phenomena of dowry and rape related murders, women are a target of a diversity of social and economic forces. Without drawing them into labour force and empowering them, it will not be possible to counter the adverse sex ratio.⁷⁰

67. Indian Express (Report), New Delhi, 28 March 1991.

68. M.K. Premi, The Demographic situation in India, Papers of the East-West Population Institute, no.80, Hawaii, 1982, p.65.

69. Yojna (Report), vol.35, no.9, May 31, 1991, Publication Division, Government of India, New Delhi, pp.4-6.

70. Anjali Desh Pande, "Census underlines anti-women bias", Telegraph, Calcutta, 24 May 1991.

Gulati says, "Family planning programmes, especially sterilization, being major component of it, has been viewed to contribute towards the declining sex ratio in India."⁷¹

Cultural patterns dictate the greater worth of males on both producers and heirs in much of India. The birth of a son is a occasion for celebration, while the birth of a girl is greeted with silence. There is much to suggest that the outright female infanticide of a century ago has been transformed in a more subtle practice - deliberate neglect⁷² and discrimination against females, even in nutrition.⁷³

✓ The exceptionally higher literacy, the higher status of women in the society, weaker sex preferences, better health facilities all these factors are responsible for higher sex ratio in Kerala.⁷⁴ Singh also concluded that the striking disparity in the sex ratio in north-western region

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71. S.C. Gulati, "Declining sex ratio in India", Financial Express, Bombay, 15 December 1991.
72. Shanti Ghosh, "Born to Die", Statesman, New Dlehi, 24 November 1985.
73. Y.P. Gupta, "A Dangerous Trend", Financial Express, Bombay 25, August, 1991.
74. S. Sulaja, "Sex ratio in Kerala", unpublished paper, presented at XV IASP Conference, Trivandrum, Kerala, December 1991.

is more due to social and cultural rather than biological reasons.⁷⁵

The observation regarding the relatively low proportion of females at the highest level of development may be regarded as indication of the fact that the process of modern development has contributed in lowering the sex ratio, and might continue to affect the sex composition of the population in India in near future also. The reasons seem to be quite obvious because with the onset of modern development i.e. industrial growth, the process of population redistribution gets momentum, which in turn results in to the growth of urbanization. And in the urban areas, the proportion of females to males is significantly lesser than the rural areas, because of job requirement etc.⁷⁶

On the basis of available research work, the hypothesis that the neglect of female is the main reason of declining sex ratio is taken for analysis. As the socio-economic conditions varies from one region to another, this

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75. K.P. Singh, "Sex ratio in North-western Region: A sociological study", unpublished paper, presented at XV IASP Conference, Trivendrum, Kerala, December 1991.
76. M.K. Jain, "Regional development and the sex composition of population in India", Journal of Social & Economic Studies, vol.III-2, 1975, pp.312-21.

lead to imbalance in sex ratio. These are (i) female work participation rate in Secondary and Tertiary sector (age group 15-59) ii) female literacy rate (age-group 5 and above) iii) female's mean age at marriage, iv) total fertility rate and (v) Infant mortality rate.

These variables are discussed as follows:

i) Female work participation rate in secondary and tertiary sector

Female work participation rate has been taken only for the age group 15-59. As the job opportunities for females in urban areas will be more, sex selective bias in migration will be low and this will lead to balance in sex ratio. Hence, there will be positive correlation between urban sex ratio and female work participation rate in secondary and tertiary sector.

(ii) Female literacy rate

Literacy rate has been calculated above the age of 5. Literacy among women has been frequently mentioned as an important contributory factor to the changing attitude among women to their traditional role as home maker and bearer of children. Education is an important factor governing the utilization of public health services, thereby reducing the mortality and raising life expectancy. All these factors influence

the sex ratio. Hence there will be positive correlation between urban sex ratio and literacy rate.

iii) Total fertility rate

The desire to improve one's position in social scale has been stressed an important motive for family limitation. During the period, when family size declined, the mobility between social classes increased greatly and new attitude towards social mobility developed. High fertility rate also contribute to higher maternal mortality rate.

As all those factors have adverse impact on sex ratio, it can be hypothesised that urban sex ratio is inversely related with total fertility rate.

iv) Female mean age at marriage

Early marriage bring about early child bearing and frequent pregnancies resulting in physical stress on the teenaged mother and underweight babies. As higher age at marriage reduces the reproduction period, female has to face less number of pregnancies. Age at marriage is influenced by the prevailing social system. As mean age at marriage is considered an indicator of status of female, which shows change in the attitude of society towards female, there may be expected positive correlation

between urban sex ratio and female mean age at marriage.

v) Infant mortality rate

IMR is considered the most important and easily available indicator of health and development. As it affects the life expectancy at birth (), it has close relationship with long life. As development took place female becomes higher than the male and it affects the sex ratio. So there may be inverse-relationship between urban sex ratio and IMR.

(iv) Objectives of the study

Following are the main objectives of the study:-

- (1) To analyse the trend in sex ratio since 1901 to 1991 for total and urban population of India and major states.
- (2) To establish the nature and extent of recent regional variation and pattern of the sex ratio of total urban and Class-I cities population of India and major states.
- (3) To know the sex composition of class I cities of major states of India.
- (4) To analyse the growth rate of male-female population and its impact on sex ratio.
- (5) To know the impact of changes in explanatory variables on urban sex ratio.
- (6) To establish the relationship between sex ratio and size of the city.

(v) Data base and research design

Study is basically based on the secondary data collected in various censuses. Census is the most important source of data.

In order to examine the urban sex ratio and the relevance of different variables in its context, within the Indian sub-continent, with its distinct culture, social values, economic development, technological progress etc. Data has been collected at the state level-pertaining to two census periods 1971 and 1981. For this study, only major states have been considered to avoid the comparability of data with smaller states they are prone to drastic change, due to small change in population and second reason is that data for the small states are not available according to the demand of analysis. The census had not been conducted in Assam in 1971 and Jammu and Kashmir in 1991. Fourteen major states include - Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh and West Bengal.

As the objectives of the study indicate, there is a need of following data to explain the urban sex ratio. Selection of the variables is based on two considerations - i) availability of data and (ii) possible relationship with urban sex ratio.

On the basis of this, the order of variables and their source can be put in the following order:

1. Sex ratio for total and urban population of India, its major states and class I cities:-

i) Census of India, 1981, General Population Tables Ser-I, Pt. II-A, (ii) India and states series. ORGI, New Delhi.

ii) Census of India 1991, Provisional population Totals, paper of 1991, ORGI, New Delhi.

iii) Census of India 1991, Provisional Population, Rural-Urban distribution, Paper II of 1991, ORGI, New Delhi.

2) Infant mortality rate: IMR is not available for Bihar and West Bengal for the period 1971 and 1981.

Census of India, 1981:-

Occasional paper No.3, of 1987, REgression Estimates of Fertility for India 1971 & 1981, ORGI, New Delhi.

3) Total Fertility rate:-

Census of India 1981.

Occasional Paper No.3, of 1987.

Regression estimates of Fertility for India 1971 and 1981, ORGI, New Delhi.

4) Female Mean Age at marriage:-

i) Census of India 1971, Ser.I

Paper 4 of 1971, Female Age At Marriage An Analysis of 1971 Data, ORGI, New Delhi.

ii) Census of India India 1981,

Occasional paper No.2, of 1988.

Advance Report on Age At Marriage Differentials in India, ORGI, New Delhi.

5) Female work participation rate in secondary and tertiary sector (age group 15-59).

i) Census of India, 1971, General Economic Tables, Sn.I, Part-II, B(i) ORGI, New Delhi.

ii) Census of India, 1981, General Economics Tables, Ser.I, Part II-B(i) ORGI.

6) Female Literacy rate:- It has been taken above five year age-group.

Family Welfare Year Book, 1988, Ministry of Health and Family Welfare, New Delhi, 1990.

Correlation and Regression Analysis

Correlation literally means the relationship between two or more variables which vary in sympathy so that the movements in one tend to be accompanied by the corresponding movements in the others. Correlation Co-efficient $r(x,y)$ between two variables x and y is a measure of the direction and degree of the linear relationship between two variables which is mutual. It is a pure number lying between ± 1.0 .⁷⁷

77. S.C. Gupta & V.K. Kapoor, Fundamentals of Mathematical statistics, Sultan Chand and Sons, New Delhi, 1983, p.640.

In this exercise, it has been used to know the degree and direction of change in USR due to change in other variables.

Regression analysis is a mathematical measure of the average relationship between two or more variables in terms of the original units of the data. In regression analysis, there are two types of variables. The variables whose value is to be predicted is called dependent variable which is USR and the variable which is used for prediction is called independent variable.⁷⁸

Regression analysis is used because it aims at establishing the functional relationship between the two variables under study and then using the relationship to predict or estimate the value of dependent variable for any given value of the independent variable. It also reflects the nature of the variable.

In this exercise stepwise regression analysis has been used, because in it the number of independent variable can be added or dropped according to their significance and it also shows the predictability of every independent variable.⁷⁹

78. *ibid.*, pp.640-41.

79. William W. Cooley and Paul R. Lohnas, "Multivariate procedures for the Behavioural sciences", John Willey and Sons, New York, 1962, p.34.

(vi) Chapterisation Scheme

Total study has been divided into four chapters.

Chapter-I deals with introduction, international comparison of sex ratio, literature review, data base, selection of variables and research design.

Chapter II deals with the regional pattern of total and urban sex ratio for 1991. Here trend of sex ratio also has been taken from 1971 to 1991 for major states for total and urban sex ratio. Class I cities sex ratio has also been discussed.

Chapter-III deals with the factors which are responsible for the change in urban sex ratio for the period 1971-1981. It has been discussed only for the USR as the study is related with urban area only.

Chapter-IV deals with the summary and findings of the study. Here government measures have also been discussed.

CHAPTER - II

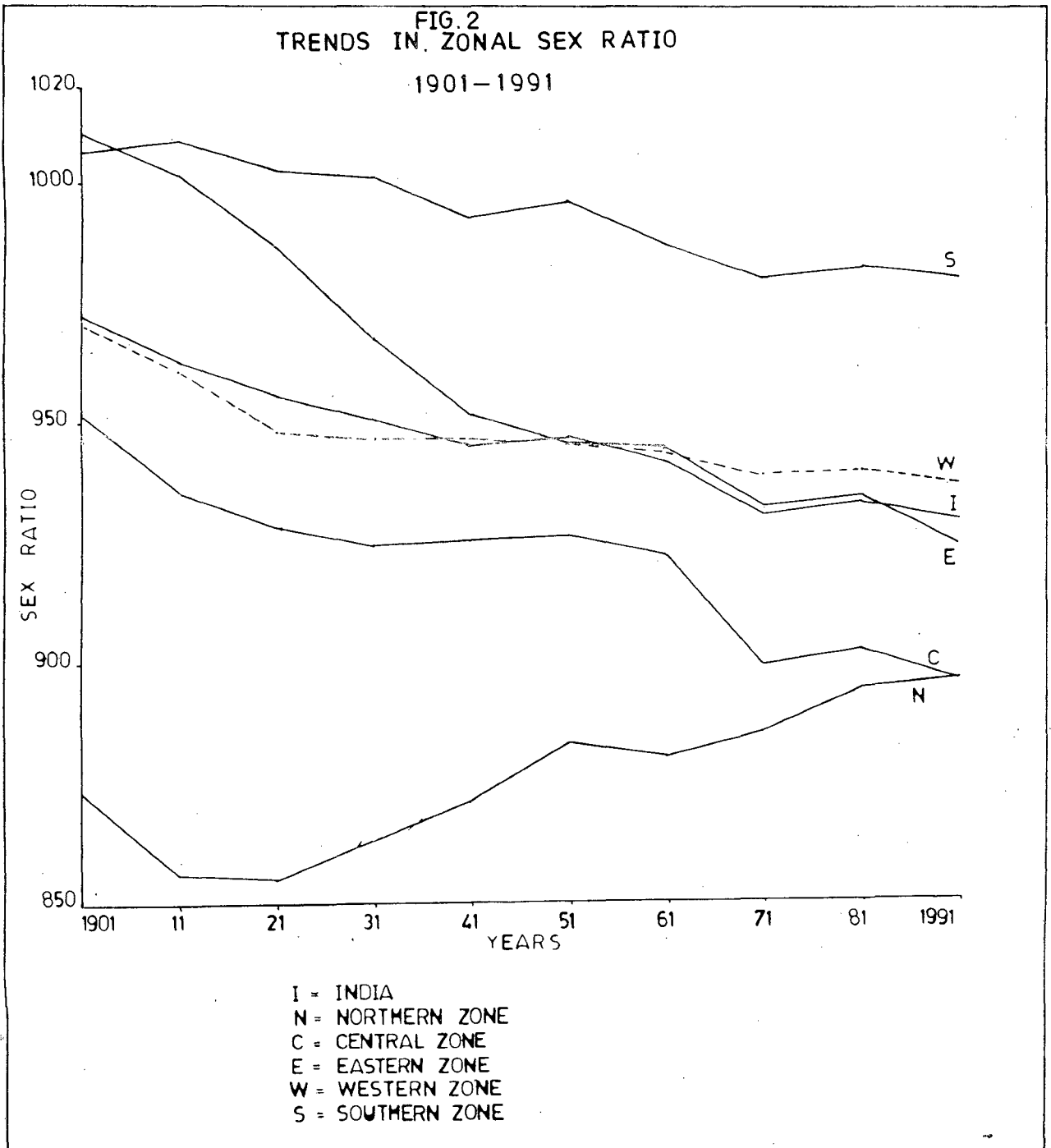
PATTERN AND TRENDS OF SEX RATIO

Areal differences in sex ratio are significant in revealing, at least partly, the character of different areas. One may not agree fully with Franklin, when he remarks that, "the regional map which might be drawn for the distribution of sex ratios should be very much like a map of the conventional regional divisions" but it is difficult to dispute this contention in general that: the ratio is an index of socio-economic conditions prevailing in these regions."¹

In this chapter an attempt has been made to analyse the trend of total sex ratio and urban sex ratio since 1901 to 1991 at All India and Major States level separately. Sex ratio of Class-I cities for all India and major state level has also been analysed. To know the pattern of changes in sex ratio, growth rate for male-female population for general, urban and Class-I cities have been calculated. Trends in growth rates have been shown by plotting their values on line graph for male and female separately. Sex ratio of different classes of towns have also been plotted for the total country.

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1. S.H. Franklin, "The Patten of Sex ratios in New Zealand", Economic Geography, XXXII, April, 1956.

FIG. 2
TRENDS IN ZONAL SEX RATIO
1901-1991



(i) Pattern and Trends in General sex ratio

The steadily declining sex ratio over the last one hundred years and particularly, since the beginning of the current century, in the Indian population has been the subject of much discussion.

1.1) Zonal Sex ratio:

Here, firstly, it will be important to look the pattern of change in sex-ratio at census zone level. The trend of decline in sex ratio is generally shared by zones. In the western zone, the decline was absent only in 1931-41, while small increments were recorded by the Central zone in 1931-41 and 1941-51 decades and by the Southern zone in 1901-1911 and again between 1951 and 1961. In the Northern zone, the sex ratio declined during the first two decades and it rose in the three consecutive censuses upto 1951 but then declined in 1951 and 1961. After this period, the sex ratio in Northern zone has shown continuous improvement. It is very interesting that, the sex ratio in Northern zone became higher in 1991 in comparison to 1901. (Table No.8, Fig.No.2).)

(In 1901, the nature of sex disproportion has not been same for all the zones. There was an excess of females in the Eastern and Southern zones and a corresponding

deficiency in rest of the country) In the Eastern zone, the excess of females continued till 1911 and in Southern zone till 1921. The ratio of 1931 showed approximate equality between the two sexes. The disparity between the levels of

Table No.8 : Variation in sex ratios of zonal population, 1901-1991

Year	Northern	Central	Eastern	Western	Southern	India
1910	873	951	1010	970	1006	972
1911	856	935	1001	960	1008	962
1921	855	921	986	948	1002	955
1931	863	924	967	946	1000	950
1941	871	925	951	946	992	945
1951	883	926	945	944	995	946
1961	880	922	944	938	946	941
1971	885	899	932	932	979	930
1981	894	902	934	939	981	933
1991	896	896	924	936	979	929

Source: S. Anantharan, Declining sex ratio in India - 1901-1981. Published Ph.D. Thesis, CSR/D/SSS/J.N.U., 1989, New Delhi.

*Census of India, India, Provisional Population Totals, Paper I of 1971, ORGI, New Delhi.

Table No.9 Deviation of Zonal sex ratio from the sex ratio of national population, 1901-1991.

Year	Northern	Central	Eastern	Western	Southern
1901	-99	-21	+38	-2	+34
1911	-108	-29	+37	-4	+44
1921	-100	-28	+31	-7	+47
1931	-87	-26	+17	-4	+50
1941	-74	-20	+6	+1	+47
1951	-63	-20	-1	-2	+49
1961	-61	-19	+3	-3	+45
1971	-45	-31	+2	+2	+49
1981	-39	-31	+1	+6	+48
1991	-33	-33	-5	+7	+50

*Deviation = Zonal sex ratio - National sex ratio

Source: Table No.8.

zonal sex ratios varied from census to census. However, from the beginning of the century, Southern zone recorded the highest sex ratio and Northern the lowest. The range between the highest and lowest sex ratio was 137 points in 1901. It became highest in 1911 and after that it started narrowing down and became 83 points in 1991. For the Northern zone the differential has been the largest in all the census years from National average but it became narrow

TABLE NO. 10
STATEWISE SEX RATIOS, 1901 - 1991.

STATE	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
A.P.	985	992	993	987	980	986	981	977	975	973
BIHAR	1054	1044	1016	994	996	990	994	956	946	912
KARN.	983	981	969	965	960	966	959	957	963	961
KERL.	985	992	993	987	980	986	981	977	975	973
M.P.	990	986	974	973	970	967	953	943	941	932
ORIS.	1037	1056	1086	1067	1053	1022	1001	989	981	972
T.N.	1044	1042	1029	1037	1012	1007	992	979	977	972
HAR.	867	835	844	844	869	871	868	867	870	874
PUN.	832	780	799	815	836	844	854	865	879	888
RAJ.	905	908	896	907	906	921	908	911	919	913
U.P.	937	915	909	904	907	910	909	879	885	881
W.B.	945	925	905	890	852	865	878	891	911	917
GUJ.	954	946	944	945	941	952	940	934	942	935
MAH.	978	966	950	947	949	941	936	930	937	935

after 1911 and it has steadily declined to reach 33 points in 1991 (Table No.9). For the Central zone, there was a declining trend in range but from 1971 onward it again widened. The sex ratio of Western zone has maintained close proximity to national average in all census years. Eastern zone has reported the value of sex ratio above national average except the period of 1951 and 1991 when it came down.

✓ 1.2) State level trend of sex ratio:

The trend of sex ratio during the period of 1901-1991 at state level has been stable. The states which have reported the sex ratio above national average, remained throughout so except for minor variations. The states have been arranged according to their level of sex ratio in comparison to national average. (Table No.10). Punjab is the only state which has reported its sex ratio lowest till 1981, and it was replaced by Uttar Pradesh in 1991. Bihar, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Madhya Pradesh have reported the sex ratio above the national average over the whole ninety years.

Bihar was the only state which has gone below the national average in 1991. West Bengal, Rajasthan, Uttar Pradesh, Punjab and Haryana have reported lower sex ratio in comparison to national average since 1901 to 1991. Gujarat

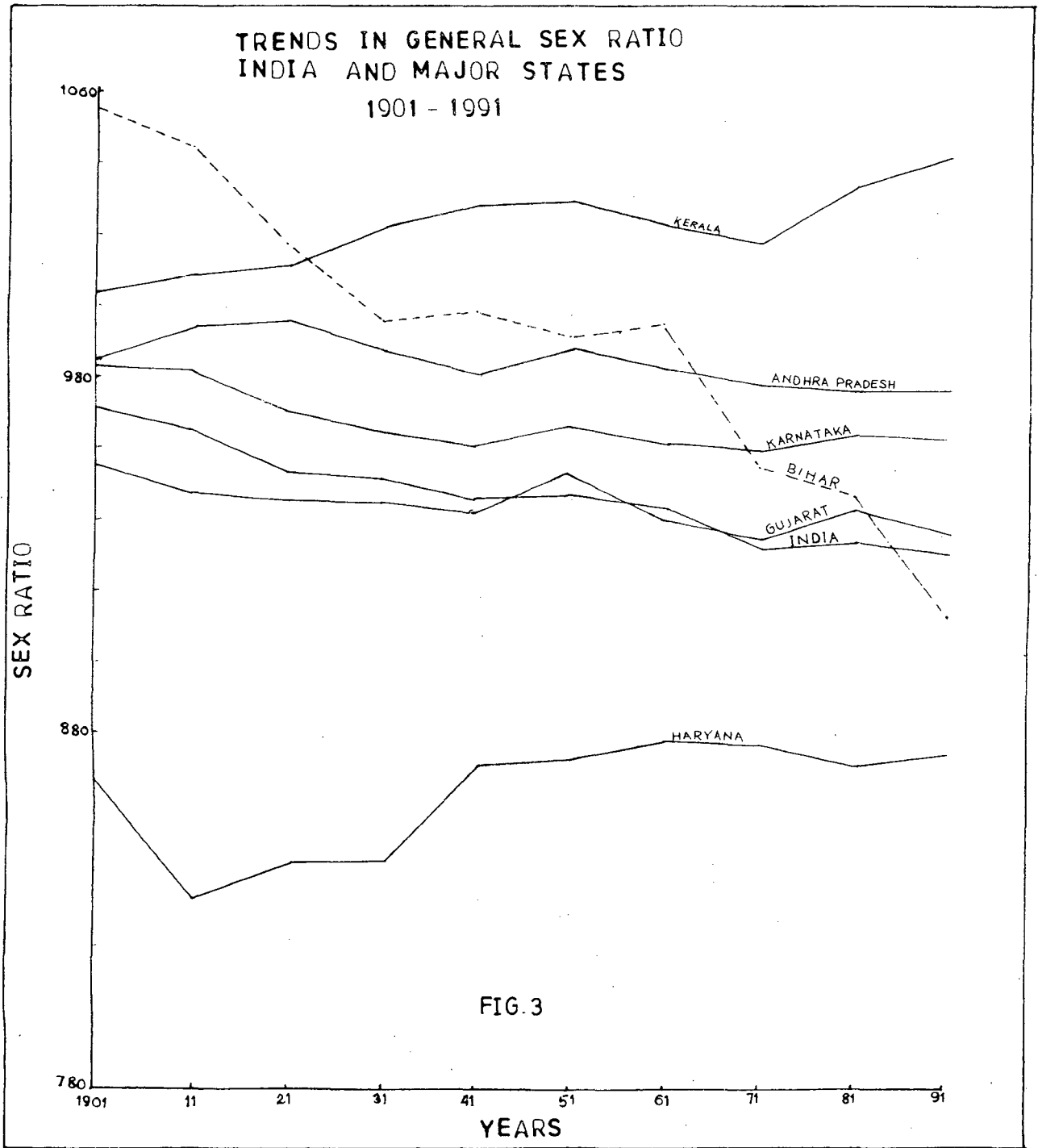
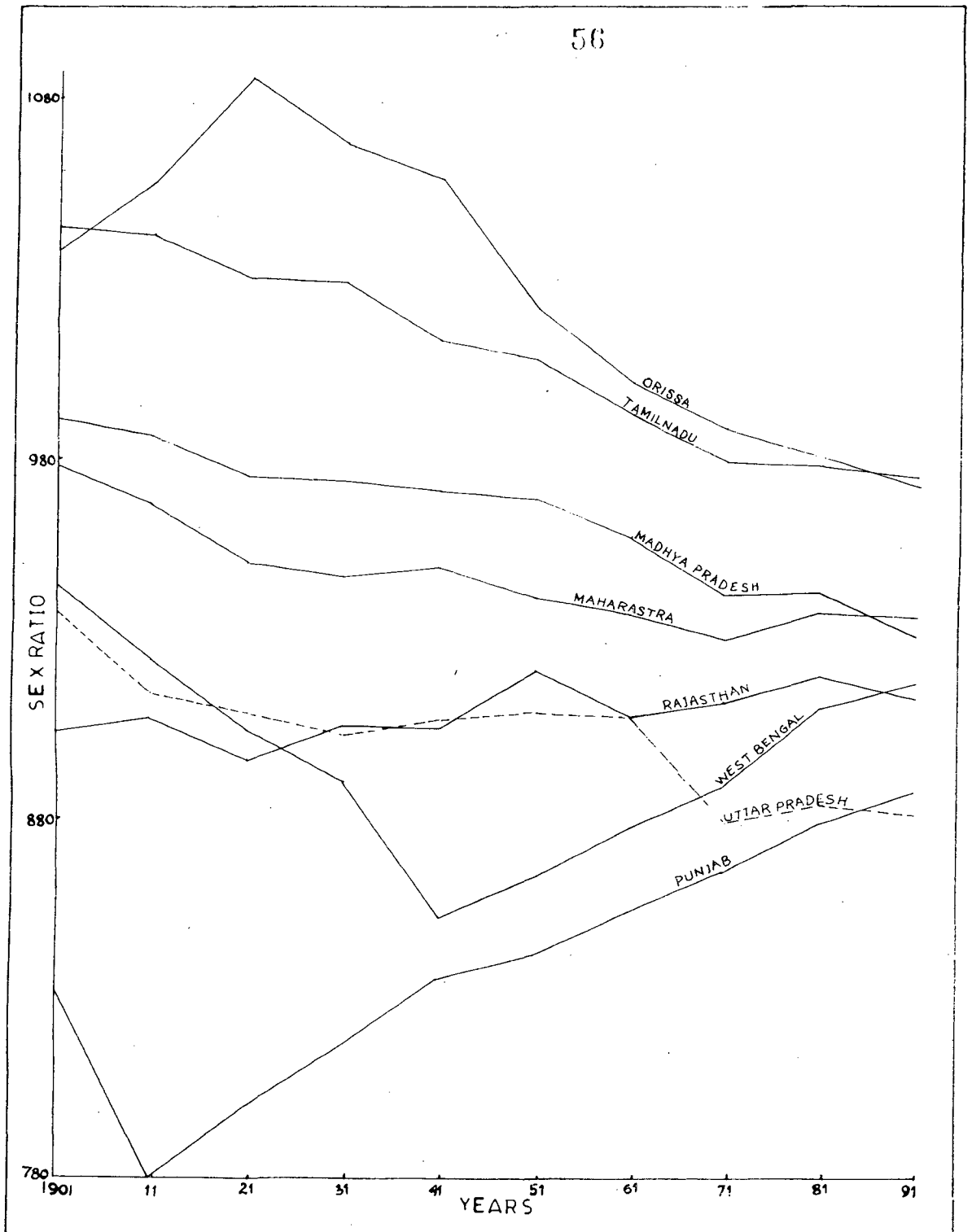


FIG. 3

CONTD.



and Maharashtra are the only two states which did not have any regular pattern but these states remained close to the national average. The graph lines show the clear trend of sex ratio in total population of India and major states. (Fig No.3).

The nature of sex disproportion as indicated by varying sex ratios of the state populations for these censuses can be elaborated. The predominance of female deficiency has been recorded all through and it has tended to increase over time. At each census, majority of the states show female deficiency. Excess of females, indicated by the sex ratio being higher than 1000, was exhibited by the four states namely Bihar, Kerala, Orissa and Tamilnadu. Among them, Kerala is the only state where the sex ratio remained above 1000 throughout the 90 year span. Among the other three states - the sex ratio was more than 1000 in Orissa upto 1961, in Tamilnadu upto 1951, and in Bihar only upto 1921. The behaviour of the ratio in Orissa was not quite similar. Here the female excess tended to increase between 1901 to 1921 and to decrease thereafter, with the result that it came to be very nominal in 1961 and reported female deficiency in 1971 first time since the beginning of this century. In Kerala, on the other hand, sex ratio increased till 1951 and then it again started declining but after 1981 it became 34 point higher in 1991 in comparison

to 1901. Comparing the sex ratio of the 1901 and 1991, it can be said that the sex disproportion among the states has declined from 222 to 166 points between the period of 1901 to 1991. This difference is the range between highest and lowest sex ratio.

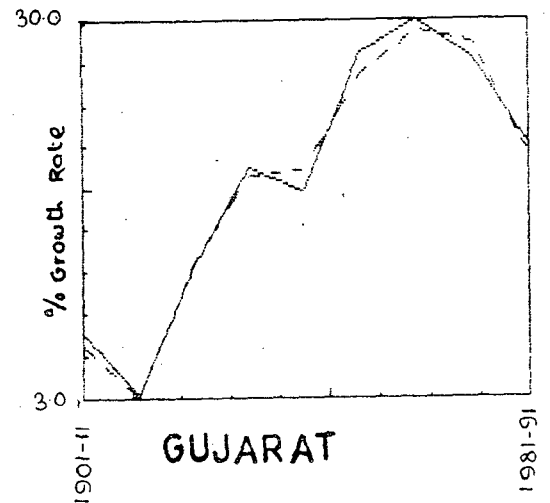
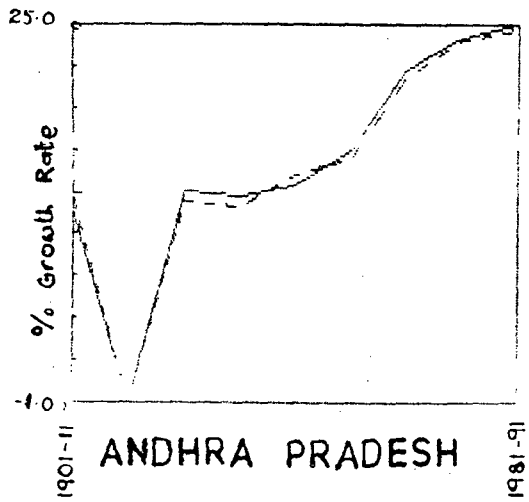
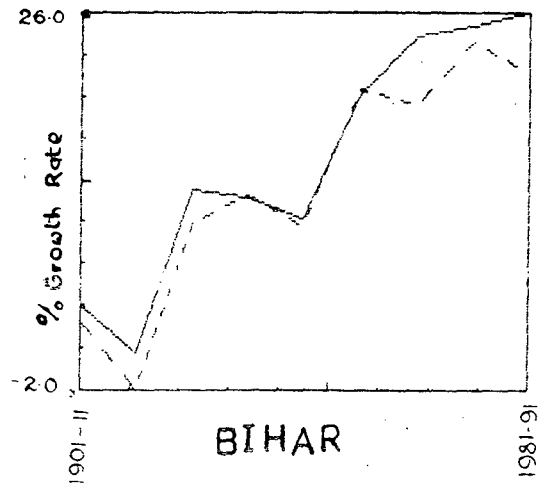
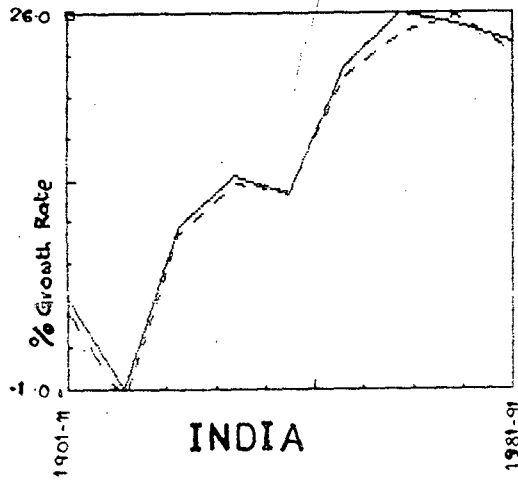
Considering the position of individual states, the ratios for eight states were closer to the national average in 1991 than in 1901. The deviation from the national ratio was reduced for Punjab, at the maximum by 10 points and on the other hand, in Bihar it has increased by 102 points. In 1991, sex ratio of six states was lower than the national average.

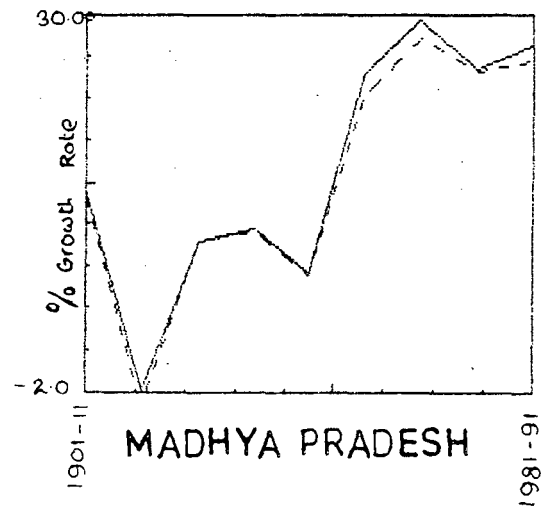
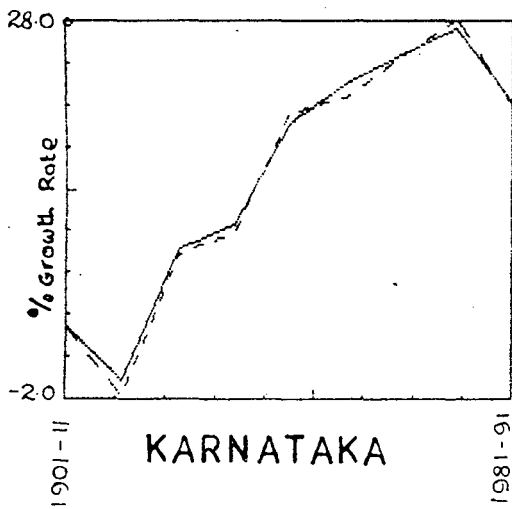
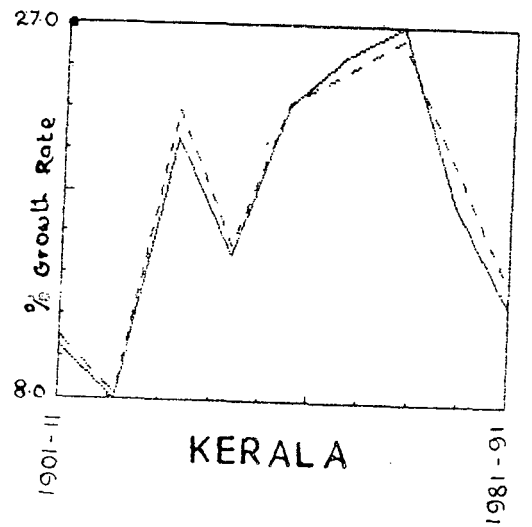
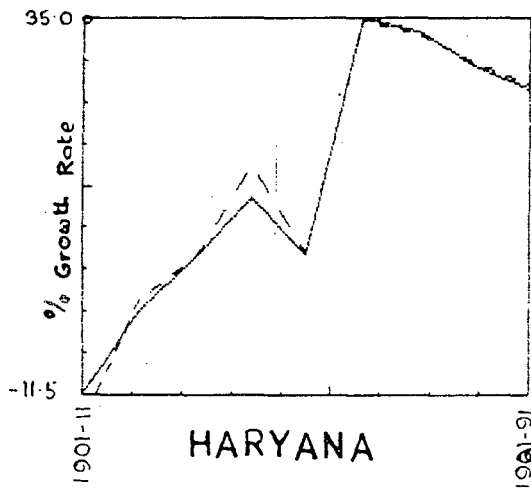
1.3) Trend of population growth by sex and its relationship with sex ratio

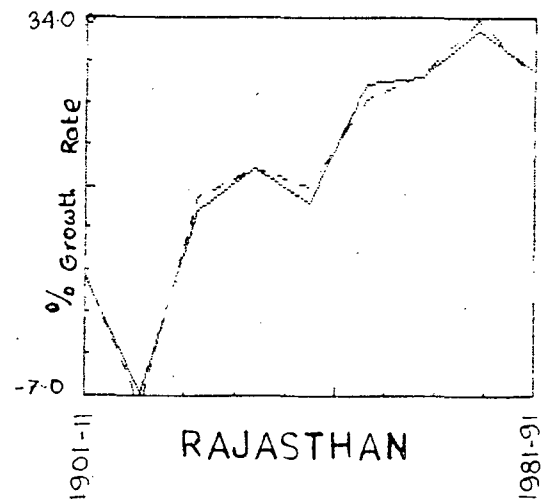
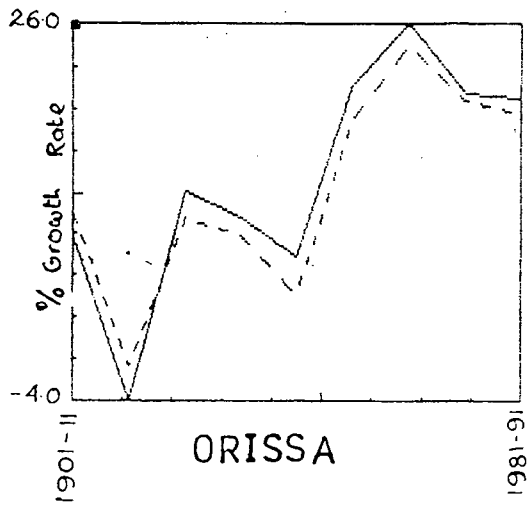
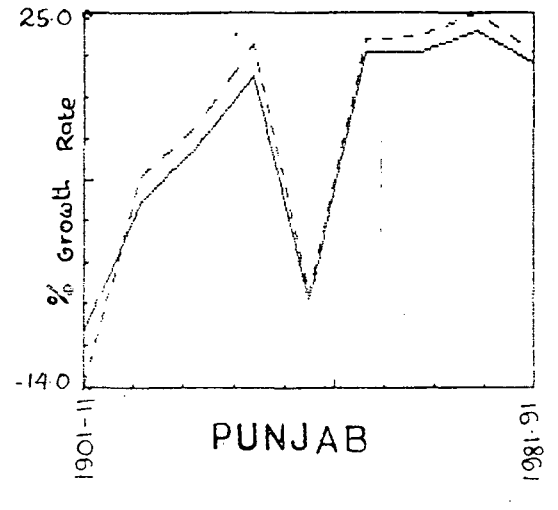
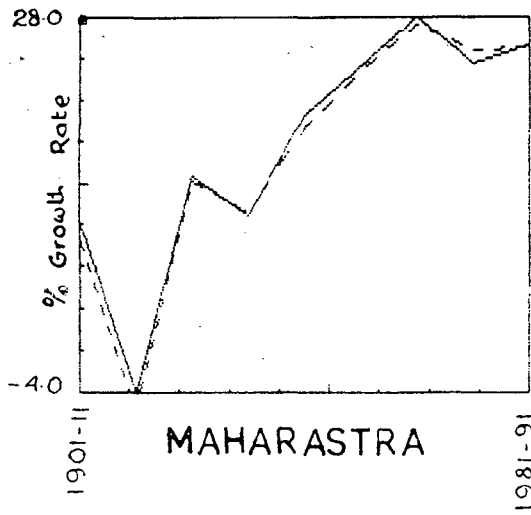
By comparing the growth rate of male-female with sex ratio, it will be helpful in explaining the trend of sex ratio over time. At All India level and at the major state level, most of the years reported higher male growth rate than female, which coincides with the declining trend of sex ratio (Appendix No.1). In case of India, since the beginning of this century, male growth rate has remained higher than the female growth rate except 1941-51 and 1971-81 decades, when female growth rate was 0.15% and 0.48% higher than male respectively. The decade of 1961-71 showed

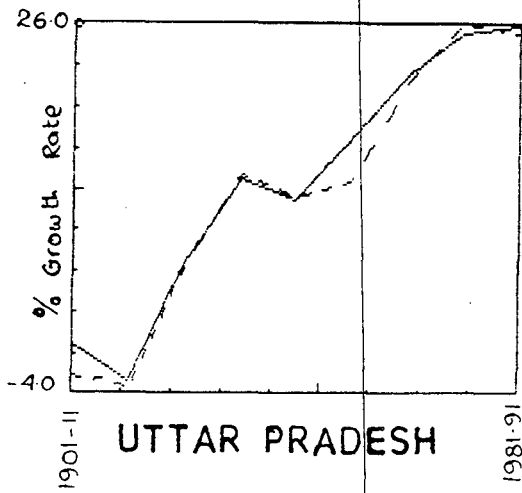
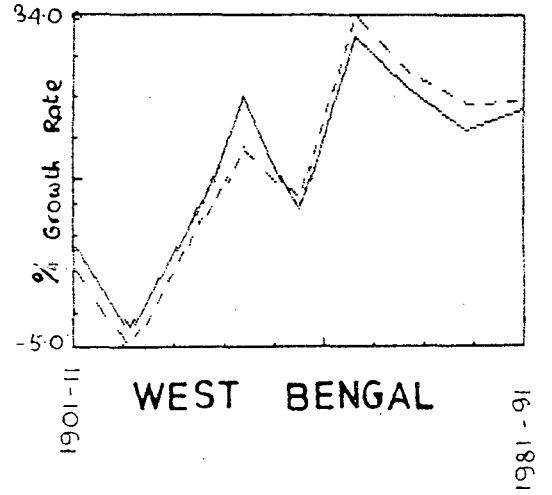
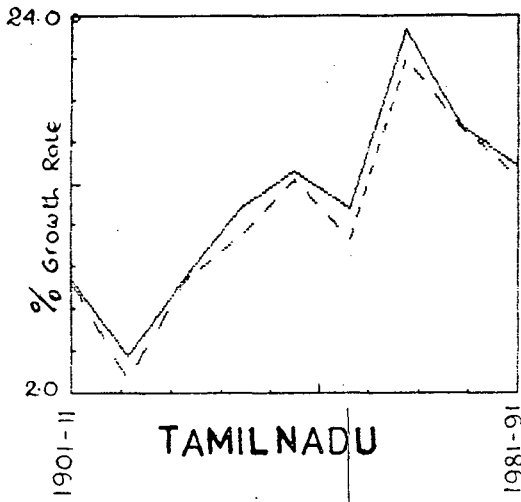
Fig. 4

TRENDS IN GENERAL POPULATION GROWTH RATES BY SEX INDIA AND MAJOR STATES, 1901-1991.









----- FEMALES
 _____ MALES

the highest excess of male growth rate over female growth rate throughout the period: which was 1.49%. During the period of 1911-21, Bihar, Haryana, Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal registered excess decline in growth rates over males growth rate. Punjab was the only state, where female growth rate has been reported higher than the male except in the period of 1901-1911 and it can be seen that with the increasing trend in sex ratio, it will be approximately close to national average after some time. After 1941-51; West Bengal has also reported higher female growth rate throughout the period, but earlier to this, male growth rate remained quite high. Madhya Pradesh and Tamilnadu have shown higher male growth rate and it coincides with the declining trend of sex ratio. Among all the major states, Bihar is the only state which has shown highest growth rate difference in 1961-71 and 1981-91 and it was in favour of males. These growth rates by sex have been plotted on the line graph (Fig.4) which presents clear cut trend in the growth rate differentials over time. [High difference in male and female growth rate in particular periods in different states are indicative of female undercount or male overcount.]

[At state level the impact of migration is also important, in changing the sex ratio over time and space, as

the population redistribution is influenced by the socio-economic development of a region. The high range of growth rate in population explained this phenomenon, as it cannot be influenced by the natural increase. The sharp decline in the sex ratio of Bihar from 946 to 912 between 1981 to 1991 may be due to the declining trend of male migration from the states to other states.) According to Kundu and Sahu, "the backward states like Orissa, Madhya Pradesh, Rajasthan and Utter Pradesh have also experienced significant deduction by about six per thousand males on an average. This can be explained largely in terms of slowing down of outmigration and returning of the outmigrants for Holi and other socio-political reasons."² The four developed states namely Gujarat, Tamilnadu, Karnataka and Maharashtra have also recorded declines in the number of females, although the magnitude of decline is relatively less - four per thousand males. It is interesting to note that with the practical stoppage of immigration to Sri Lanka, Burma and Malaysia, since the thirties, the high sex ratio in Tamilnadu area has declined gradually.³

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2. Amitabh, Kundu & M.K. Sahu, "Variation in Sex ratio; Development Implications", E.P.W. October 12, 1991, pp.2341-42.
 3. G.S. Gosal, "Regionalism of Sex Composition of India's Population", Rural Sociology, 2612, June 1961, pp.136.

[Geographically speaking, the 22° N. Latitude is the dividing line between the high and low sex ratio in India, where above 22°N. latitude sex ratio is below national average and south of it, above national average. This phenomena explains the situation of females in two different social set-ups.]

2) Pattern and Trends in Urban sex ratio

It is seen that sex composition of any population is determined by the proportion of two sexes at births and deaths and is also affected by the sex differentials in population movement. All these factors affecting the sex composition of the population in turn vary according to the extent of development of a particular area. Due to imbalance in regional development, the redistribution of population will take place and the migration to industrialized area will be male dominated, which will give rise to excess of males over females in urban areas.

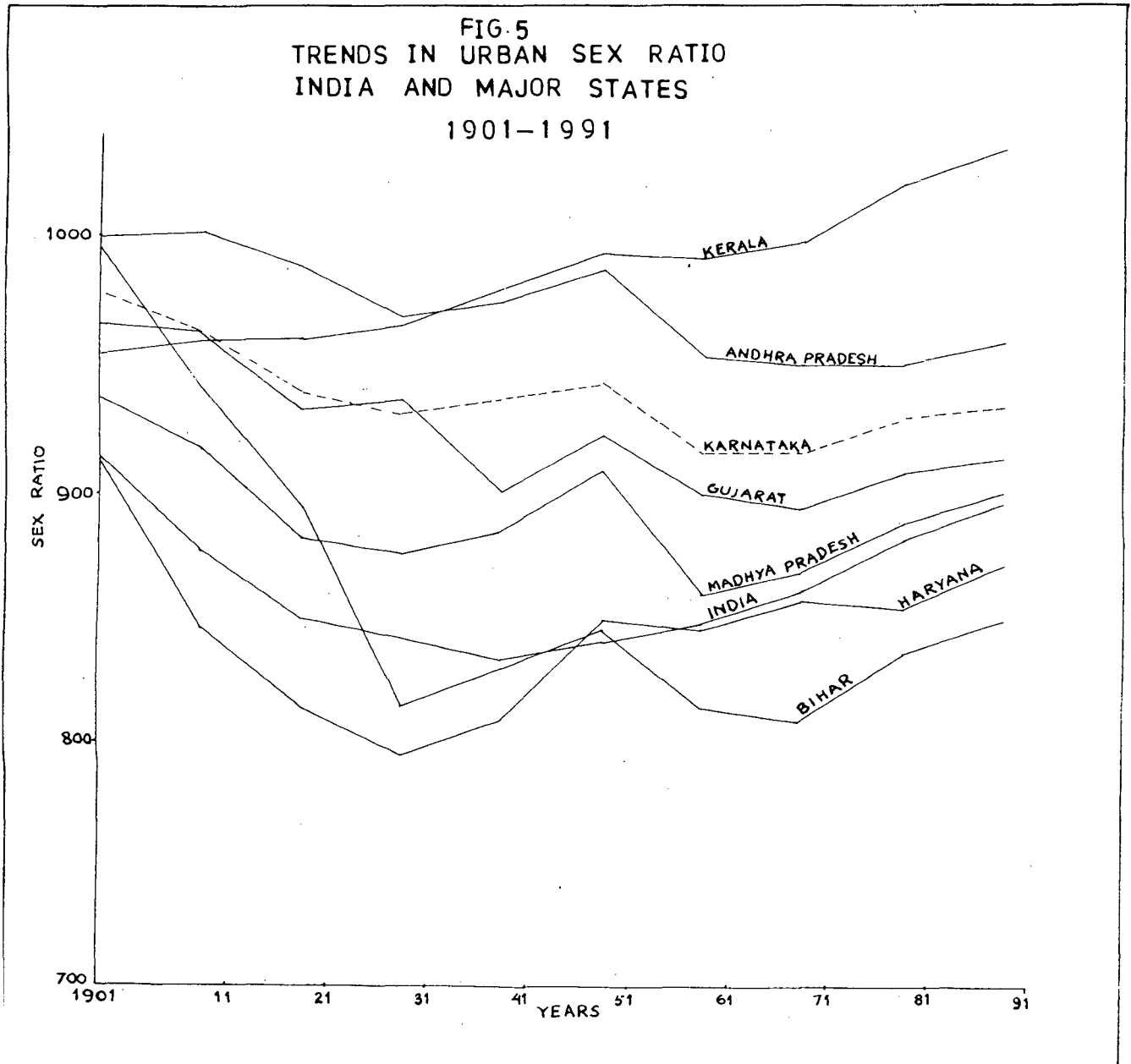
2.1) Trend at state level:

Since the beginning of this century, most of the states have shown variation in sex ratio from one decade to another. The fluctuation of urban sex ratio is also affected by the change in general sex ratio. Gujarat, Karnataka, Andhra Pradesh, Tamilnadu, Kerala and Madhya

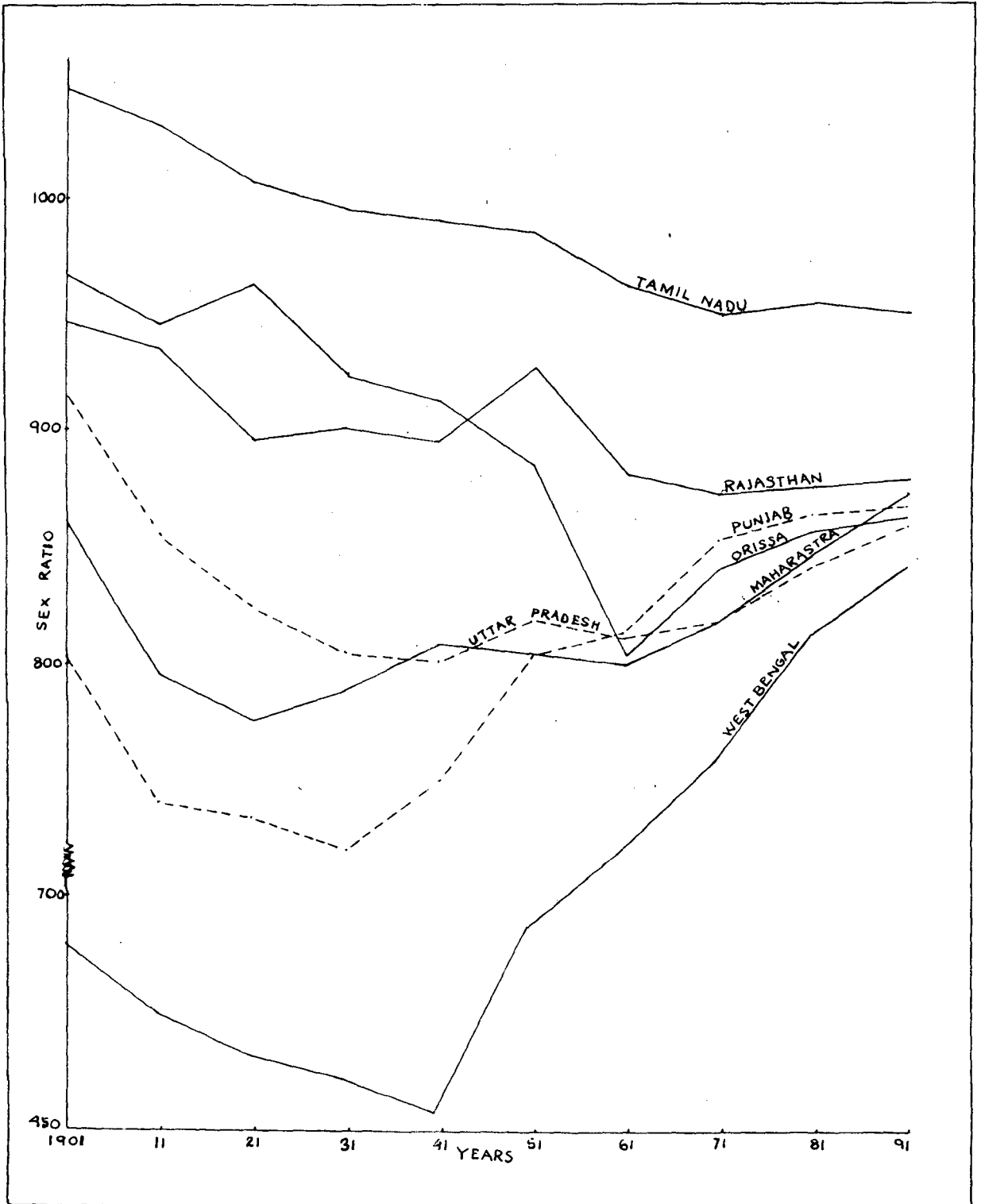
TABLE NO. 11.
TREND OF URBAN SEX-RATIOS, INDIA AND MAJOR STATES,
1901-1991

STATE	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
INDIA.	910	872	846	838	831	860	845	858	878	893
A.P.	999	1000	986	966	975	987	951	949	948	957
BIHAR	997	937	869	813	828	842	811	807	832	846
GUJR	965	960	931	934	898	920	896	893	905	909
HARY.	908	842	811	792	806	845	843	853	849	868
KARN.	976	959	936	927	935	941	913	913	926	930
KERL.	953	957	958	964	979	992	991	997	1021	1033
M.P	937	913	878	872	882	907	856	868	884	893
MAHA.	862	796	776	790	810	807	801	820	850	876
ORIS.	967	947	963	924	914	887	807	845	859	866
PUNJ.	804	740	735	721	750	807	817	856	865	870
RAJ.	947	936	897	903	897	928	882	875	877	881
TAMIL.	1048	1032	1008	997	991	986	963	951	956	951
U.P.	917	853	825	807	805	820	812	821	846	862
W.B.	650	614	591	578	559	660	701	751	819	856

FIG-5
TRENDS IN URBAN SEX RATIO
INDIA AND MAJOR STATES
1901-1991



CONTD.



Pradesh have reported urban sex ratio above the national average. Even Rajasthan has reported USR above national average till the census of 1971 and after that it has shown decline of 1 point in 1981 and 12 point in 1991. Census of 1961 is the major dividing line. After this period USR in most of the states has increased except Tamilnadu which has shown continuous decline in USR (Table-11 and Fig.No.5), West Bengal, Punjab, and Maharashtra have always reported USR below national average. Bihar, Uttar Pradesh and Orissa do not present any regular trend. In the beginning these states had USR above national average. This is very interesting to note that in southern states, except Maharashtra, all the states have reported USR above national average and northern states, except Madhya Pradesh, have reported their USR below national average. This pattern coincides somewhat with the general sex ratio. The main factors are the higher status of women in Southern India in comparison to Northern part.

2.2) Comparison between general sex ratio and USR:

To make the study more comprehensive, the differences between general sex ratio and USR have been calculated (Table No.12). At All India level, difference between general sex ratio and USR was reported highest during 1941, when it became 114 from 62 points in 1901. But after 1961,

TABLE NO. 12
DIFFERENCE BETWEEN GENERAL AND URBAN SEX RATIOS, INDIA &
MAJOR STATES .(NO. OF POINTS FOR INDIVIDUAL STATES)

1901 - 1991.

STATE	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
INDIA	62	92	109	112	114	86	96	72	55	36
A.P.	-14	-8	7	21	5	-1	30	28	27	16
BIHAR	57	107	147	181	168	148	183	147	114	66
GUJ.	-11	-14	13	11	43	32	44	41	37	26
HARY.	-41	-7	33	52	63	26	26	14	21	6
KARA.	7	22	33	38	25	25	46	44	37	31
KERL.	51	51	53	58	48	36	31	19	11	7
M.P.	53	73	96	101	88	60	97	73	57	39
MAH.	116	170	174	157	139	134	135	110	87	59
ORISSA	70	109	123	143	139	141	194	143	122	106
PUNJ.	28	40	64	94	86	37	37	9	14	18
RAJA.	-42	-28	-1	4	9	-7	26	36	42	32
TAMIL.	-4	10	21	30	21	21	29	27	21	21
U.P.	20	62	84	97	102	90	97	58	39	19
W.B.	295	311	314	312	293	205	177	140	92	61

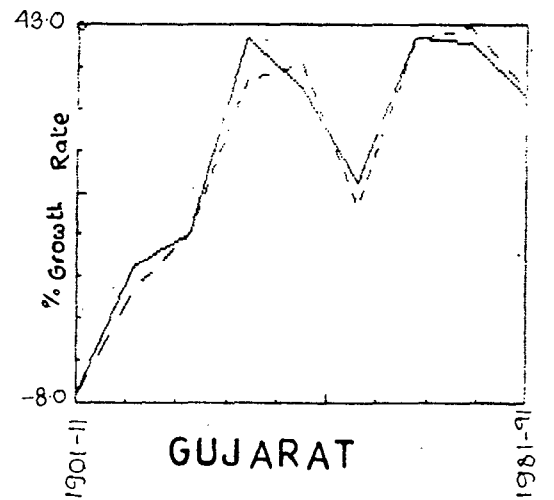
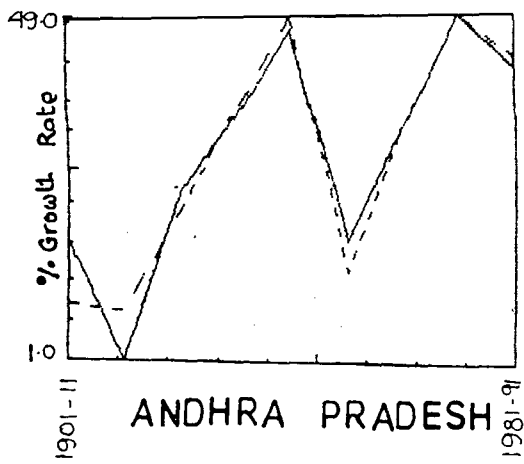
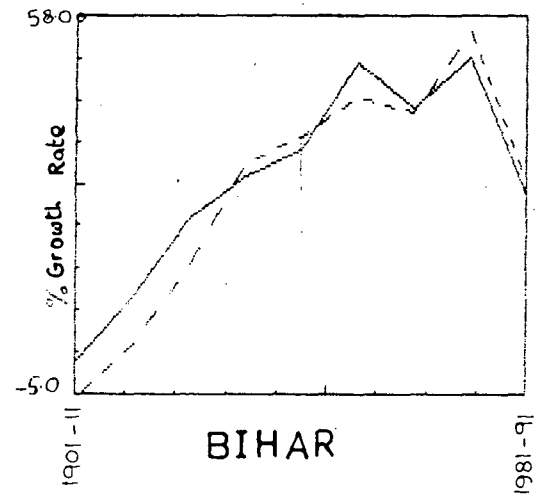
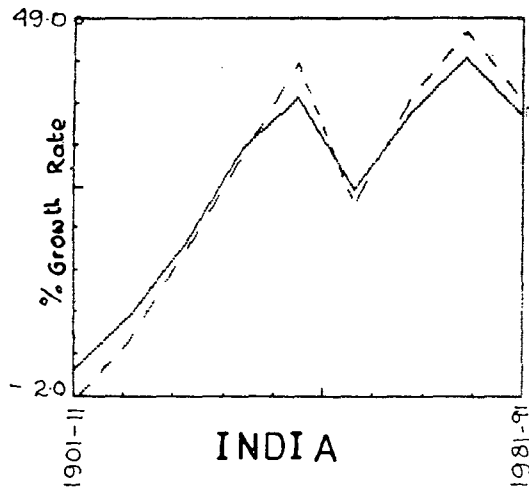
the gap narrowed down and became 36 point in 1991. West Bengal is the only state among all which has recorded highest difference of 314 point in 1921, the highest difference was registered in Orissa followed by Bihar, West Bengal and Maharashtra. the lowest difference was reported in Haryana followed by Kerala, Andhra Pradesh and Punjab. During the period of 1901 and 1911, Andhra Pradesh, Gujarat, Haryana and Rajasthan registered USR more than the general sex ratio.

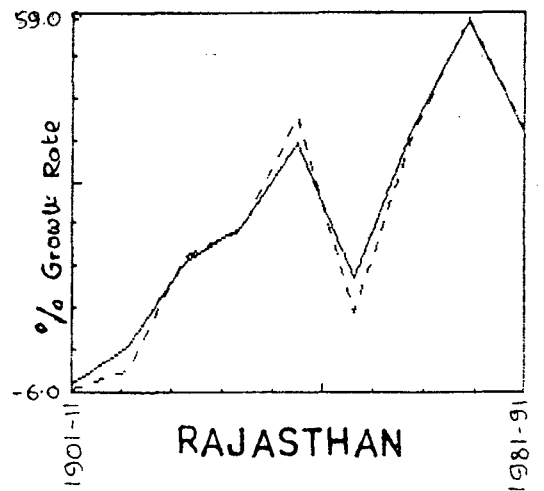
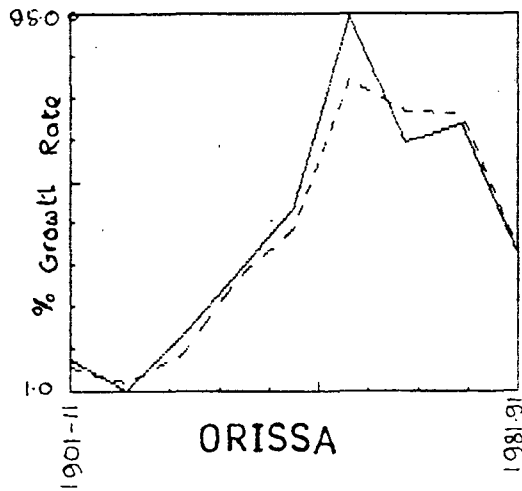
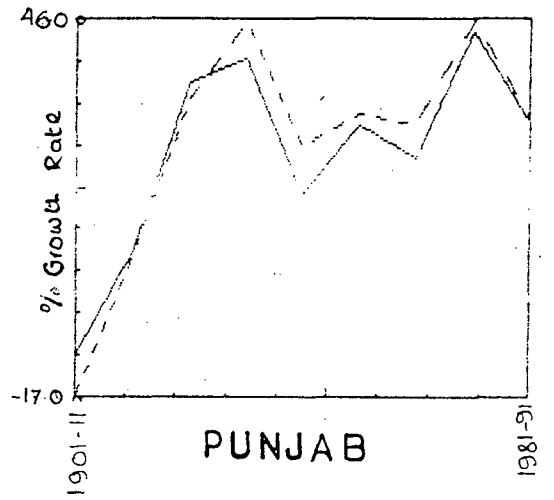
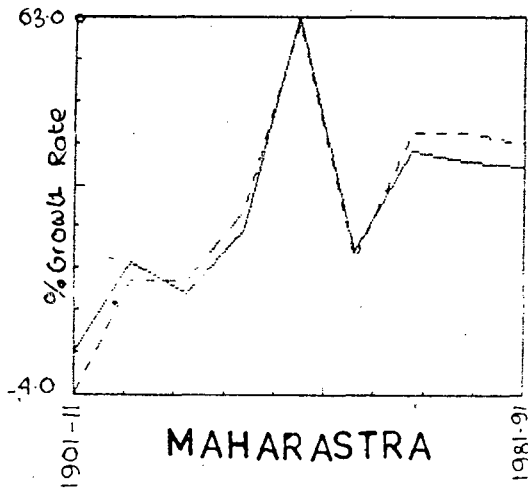
2.3) Trend of urban population growth by sex and its impact on USR

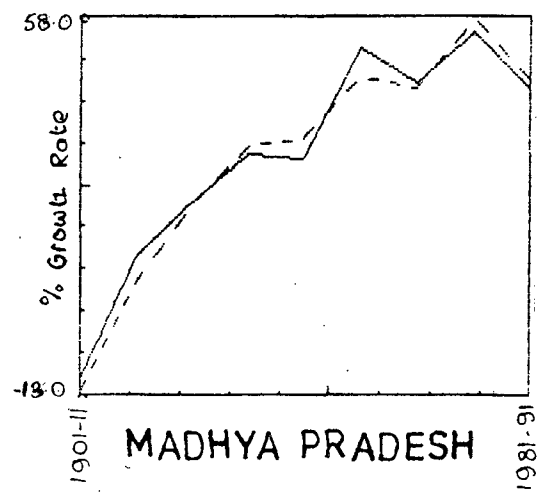
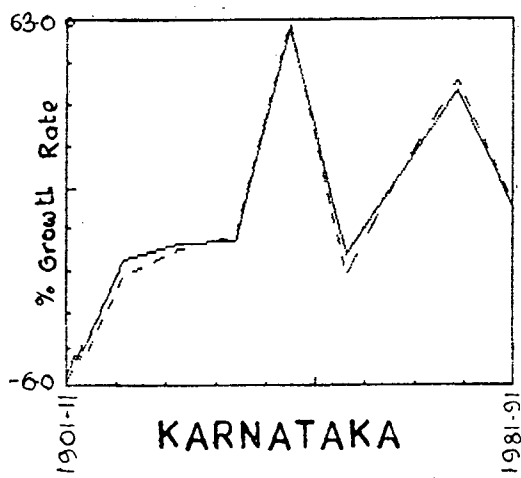
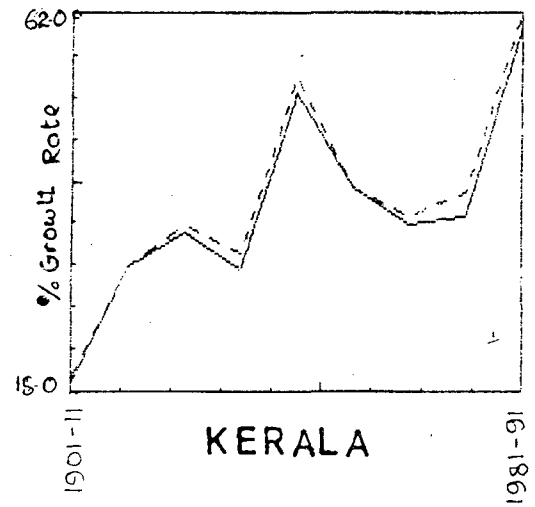
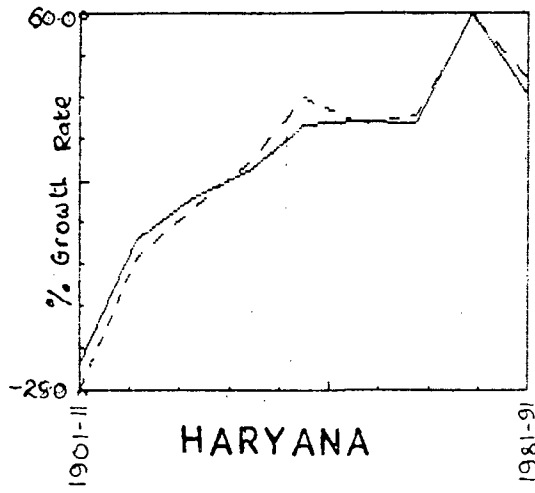
The growth rate differentials by sex will be helpful in explaining the lower urban sex ratio in comparison to general sex ratio. Since the beginning of this century, male growth rate in urban areas remained higher till 1931-41 and it became low in 1941-51 but again in 1951-61 it was reported higher than the female growth rate. But, since 1961-71, female's urban growth rate remained above 2% in comparison to male urban growth rate and in 1991 it became 2.1 per cent higher. But states behaved in a different manner. Except Tamilnadu, rest of the states recorded higher female growth rate in 1971-81 and 1981-91. Tamilnadu has recorded lower growth rate throughout the period except 1971-81 when it became excess by 0.75 per cent over the male growth rate. Male growth rate was higher than female growth

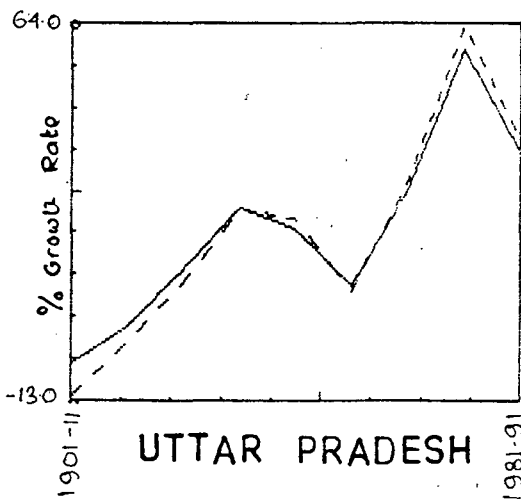
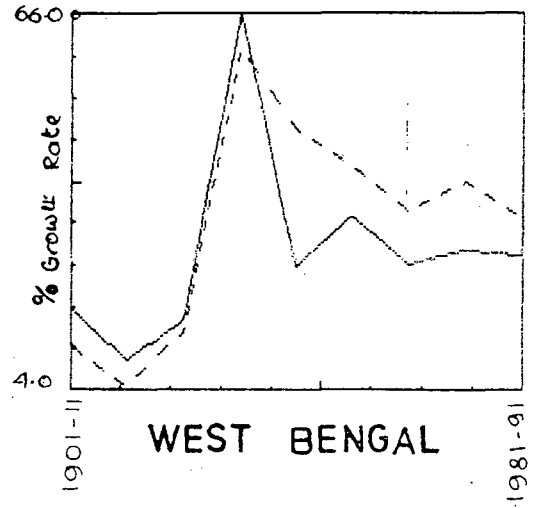
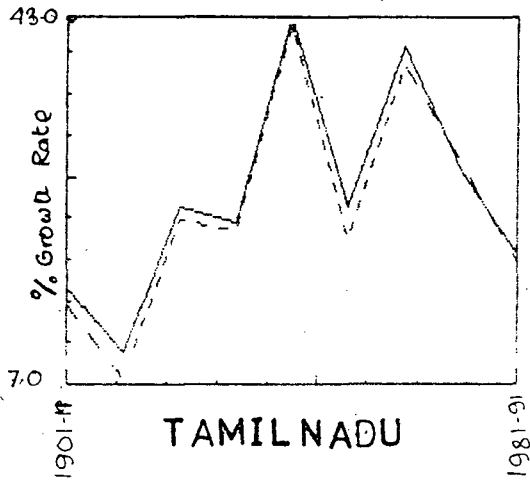
Fig. 6

TRENDS IN URBAN POPULATION GROWTH RATES BY SEX
INDIA AND MAJOR STATES , 1901-1991.









----- FEMALES
 _____ MALES

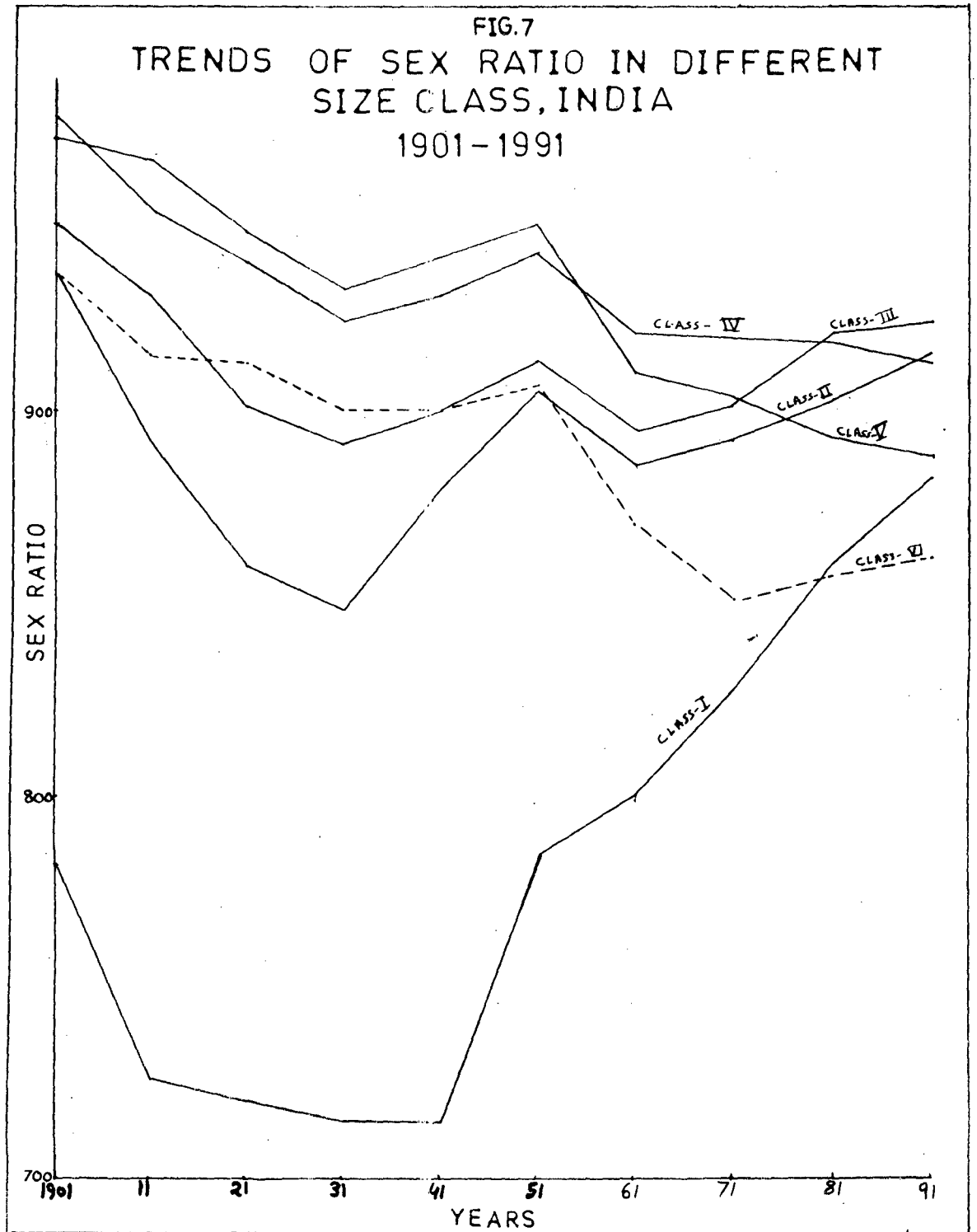
rate during the first two decades of 1901-11 and 1911-21 in most states which seem to be due to differential in male and female death rates. According to census report, Plague and Malaria were the main reasons for excess female deaths. The year 1908 and 1909 were badly hit by malaria.⁴ Kerala is the only state which has reported excess of female growth rate over males since the beginning of the century except during 1951-61 when it became 0.1 per cent below the male growth rate. (The highest difference in growth rate in favour of female in 1991 was reported in West Bengal followed by Maharashtra, Haryana and Utter Pradesh. Male and female growth rates have been plotted on the graph (Fig. No.6). The excess of male growth rate in 1951-61 over female growth rate may be due to the definitional change in 1961 for urban areas because of that many towns declassified as villages. During the decade 1951-61, the number of towns registered a marked decline from 3059 to 2699. If the 1951 census definition is accepted by hypothetically including the 1961 urban population, the increase in urban population

4. F.Ram, "Sex ratio in U.P. 1901-1991", Unpublished paper, Presented at XV, IASP, Conference, Trivendrum, Kerala, 1991. 5. V.C. Sinha & E. Zacharia, Elements of Demography, Allied Publishers Pvt. Ltd., 1984, pp.290-291.

TABLE No :13

SEX RATIO FOR DIFFERENT CLASSES, INDIA , 1901-1991

YEAR	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS V	CLASS VI
1901	784	936	951	978	973	936
1911	726	892	929	954	958	914
1921	700	861	902	938	947	913
1931	715	848	892	924	932	900
1941	715	879	899	931	940	901
1951	785	905	913	944	949	906
1961	799	886	895	920	910	870
1971	828	893	902	918	903	852
1981	860	903	920	917	892	857
1991	882	914	921	913	901	863



in the decade comes out to be 32.4 per cent and not 26.4 per cent.⁵

✓ The trend of USR has shown variation in the male-female growth rate and presents close relationship during the whole period (Appendix No.2). Sex ratio also shows increasing trend due to the increase in female growth rate, but the wide gap between the male-female growth rate in some decade remained a question of inquiry, whether it is due to migration or undercount)

✓ 2.4) Sex ratio of urban population in different class towns

To know the sex variation in urban population, it has been analysed for different size of towns at All India level. As the Table No.13 and Figure No.7 show, the tendency for the direction of change in sex ratio was not same for all the classes. Different size of town behaved in different manner. The change in the sex ratio of class-I cities had a downward trend till 1921. After that it presented positive change and sex ratio rose to 882 from 700 in 1991. Class-II did not have any specific trend till 1951, but after that it has reported some upward movement of sex ratio. Class-III also had ups and downs in the sex

5. V.C. Sinha & E. Zacharia, "Elements of Demography", Allied Publishers Pvt. Ltd., 1984, pp.290-291

TABLE NO. 14.
 PERCENTAGE DISTRIBUTION OF URBAN POPULATION BY CLASS, INDIA, 1901-1991.

YEAR	CLASS-I	CLASS-II	CLASS-III	CLASS-IV	CLASS-V	CLASS-VI
1901	26.0	11.29	15.64	20.83	20.14	6.10
1911	27.48	10.51	16.40	19.73	19.31	6.57
1921	29.70	10.39	15.92	18.29	18.17	7.03
1931	31.20	11.65	16.80	18.00	17.14	5.21
1941	38.23	11.42	16.35	15.78	15.04	3.14
1951	44.63	9.96	15.72	13.13	12.97	3.09
1961	51.42	11.23	16.94	12.77	6.87	0.77
1971	57.24	10.93	16.01	10.94	4.45	0.44
1981	60.42	11.63	14.33	9.54	3.58	0.50
1991	65.20	10.93	13.19	7.77	2.60	0.29

ratio till 1961 but after that it revealed improvement in sex ratio. Class-IV has shown continuous decline in sex ratio. Class-V and VI also revealed declines in their sex ratio. This may be due to the declining share of population in this class (Table No.14).

3) Pattern and Trends in Class-I cities sex ratio

Class-I cities share the highest percentage of urban population and even growth rate is also very high, the share of urban population in this category has increased from 26 per cent in 1901 to 65.2 per cent in 1991.⁶ Taking this fact in to consideration, only Class-I cities have been taken for the analysis of sex ratio.

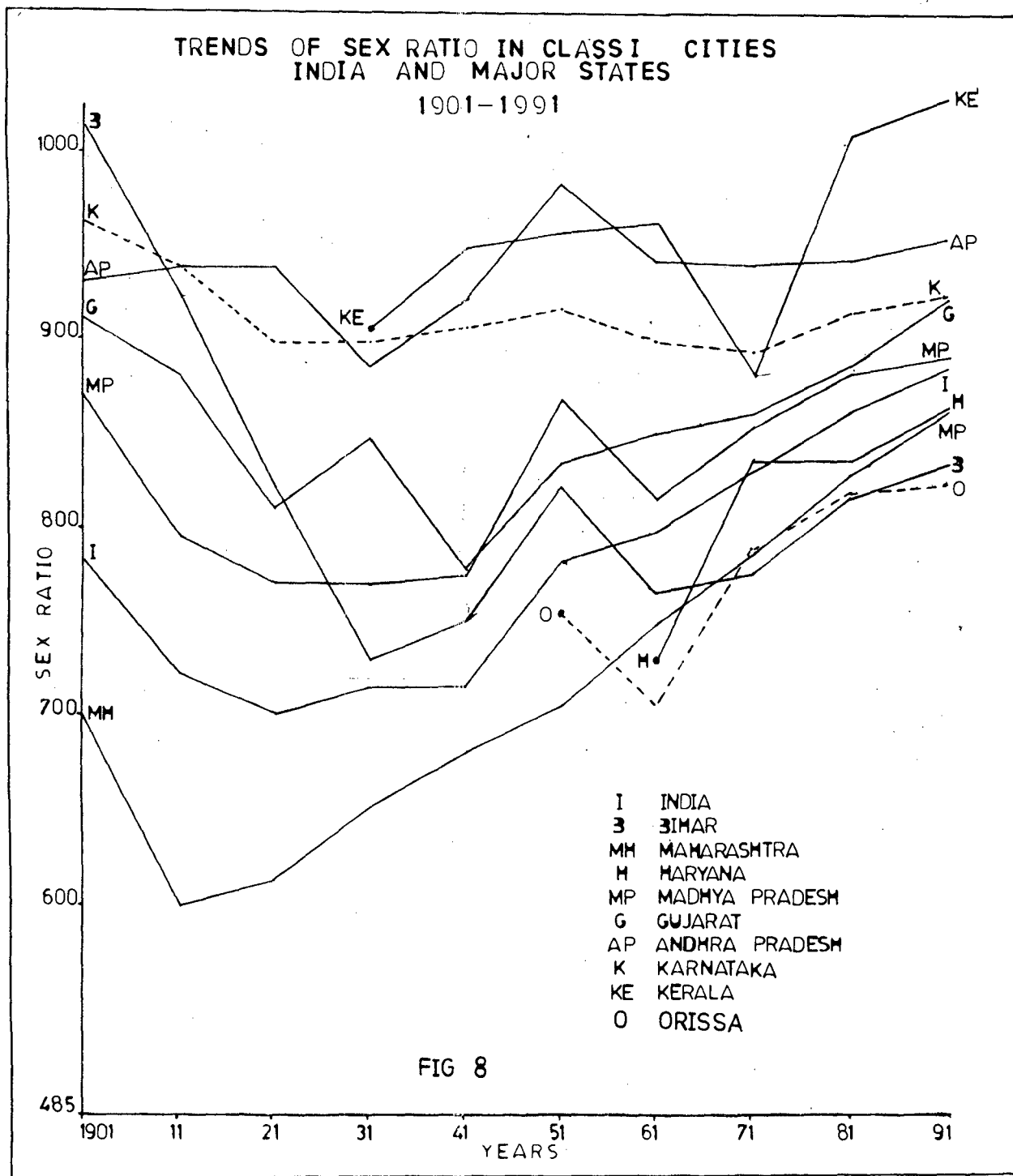
3.1) Trend at State level

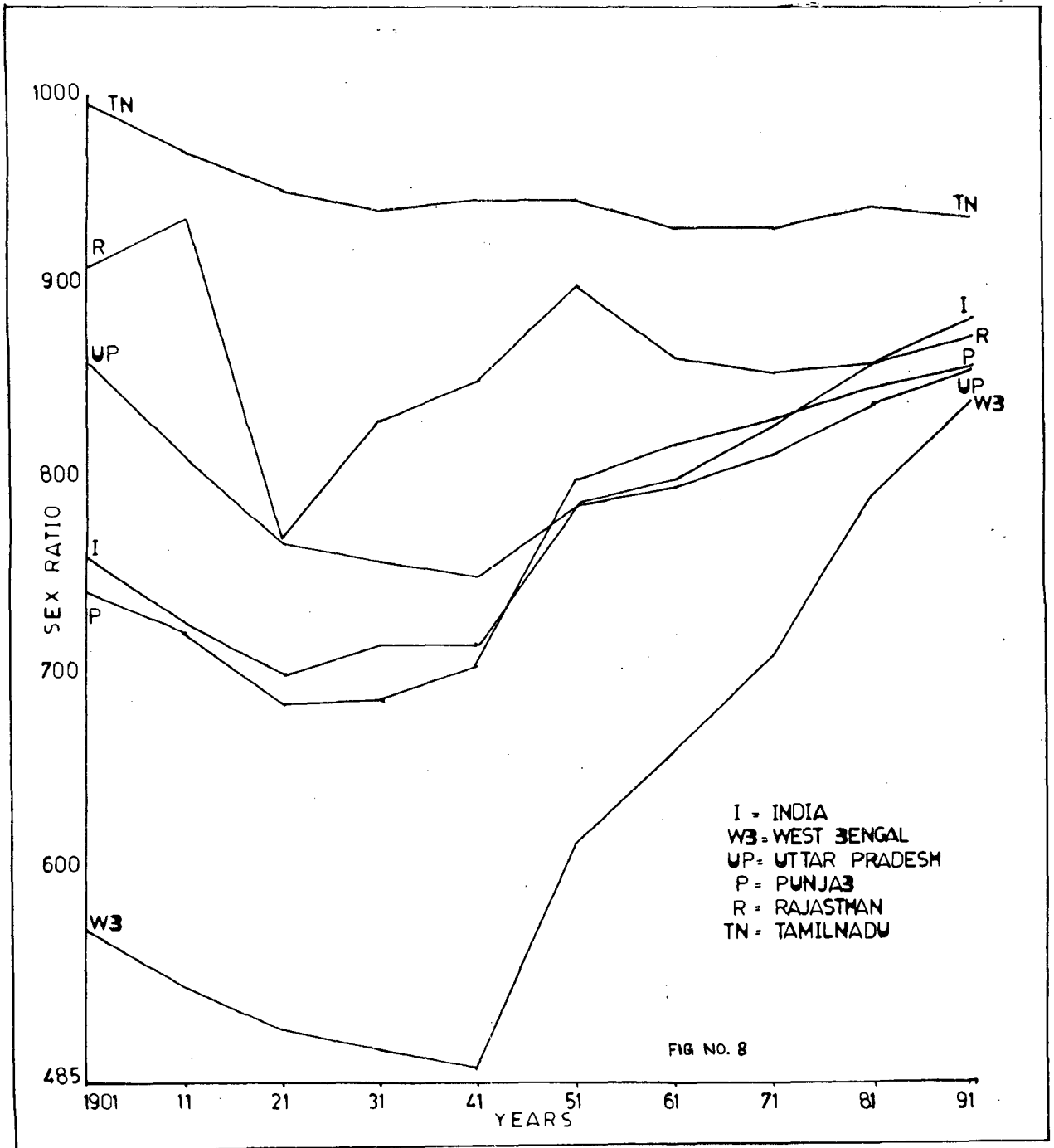
Since the beginning of this century, Class-I cities have very low sex ratio, but it has shown improvement over time. Three states did not have Class-I population in 1901. Haryana reported Class-I city in 1961, Kerala in 1931 and Orissa in 1951. Only Bihar showed excess of females over males in 1901. The states which showed sex ratio above national average in 1901 were Andhra Pradesh, Bihar,

6. Census of India, 1991, Provisional Population Totals, Rural-urban distribution, Papre No.2 of 1991, Registrar General and Census Commissioner, India, p.32.

TABLE NO. 15
SEX-RATIOS OF CLASS-I CITIES, INDIA AND MAJOR STATES,
1901-1991

STATE	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
INDIA.	784	726	700	715	715	785	799	828	860	882
A.P.	931	937	936	886	921	983	941	937	940	949
BIHAR	1016	923	823	731	749	823	766	776	815	833
GUJR	909	881	809	848	777	836	851	861	884	894
HARY.	NIL	NIL	NIL	NIL	NIL	NIL	727	836	836	863
KARN.	962	938	897	898	966	916	897	892	913	919
KERL.	NIL	NIL	NIL	905	948	954	960	880	1004	1024
M.P	869	796	770	770	776	867	816	852	879	888
MAHA.	700	599	612	649	680	705	748	786	828	861
ORIS.	NIL	NIL	NIL	NIL	NIL	755	705	787	818	823
PUNJ.	743	719	685	687	706	799	817	831	847	857
RAJ.	910	935	771	830	850	901	862	856	861	872
TAMIL.	996	970	950	940	946	945	929	930	943	934
U.P.	860	809	767	757	751	785	798	813	837	857
W.B.	567	538	551	506	495	612	660	711	792	842





Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Tamilnadu and Utter Pradesh. The below national average were West Bengal, Punjab and Maharashtra. This balance continued till 1941. In 1951, West Bengal, Orissa and Maharashtra registered lower sex ratio than the national average. After 1971, all the states have shown increasing trend in sex ratio except Tamilnadu which reported 9 point decline in the sex ratio in 1991. This trend of declining ratio in Class-I cities also resembles with USSR. The sex ratio of Class-I cities for India and major states have been given in the Table No.15. Kerala is the only state which has shown excess of females during the period of 1981 and 1991. Andhra Pradesh, Karnataka and Tamilnadu have reported Class-I cities sex ratio above 900 in 1991 (Fig.No.8). Some states have shown increase of their sex ratio more than 50 points. To substantiate this fact, it has been carried out in next step.

3.2) Growth rate of population by sex in Class-I cities and its relationship with the sex ratio:

As the difference in male-female growth rate translated into the sex ratio, and the share of urban population is more than 50 per cent in Class-I cities, due to this it becomes necessary to analyse the male-female growth rate here. The growth figures are given in Appendix No.3. The value of male-female growth rates have been

TABLE NO. 16
NUMBER OF CLASS-I CITIES, INDIA AND MAJOR STATES, 1901 - 1991.

STATE	1991	1981	1971	1961	1951	1941	1931	1921	1911	1901
INDIA	296	218	150	104	77	50	36	30	24	25
A.P.	32	20	13	11	6	1	1	1	1	1
BIHAR	17	16	11	8	5	3	1	1	1	1
GUJ.	21	13	8	6	6	4	3	2	2	3
HARY.	12	11	4	1	-	-	-	-	-	-
KARNA.	21	17	12	6	6	4	3	2	1	1
KERALA	14	8	6	4	4	3	1	-	-	-
M.P.	23	14	11	8	5	3	3	3	1	1
MAHAR.	27	25	16	13	9	4	4	4	3	3
ORISSA	7	6	5	1	1	-	-	-	-	-
PUNJAB	10	7	4	4	3	3	1	1	1	1
RAJAS.	14	11	7	6	4	4	2	2	1	1
T.N.	25	20	16	11	8	6	6	4	3	3
U.P.	42	30	22	17	16	12	8	7	7	7
W.B.	23	12	5	4	2	1	1	1	1	1

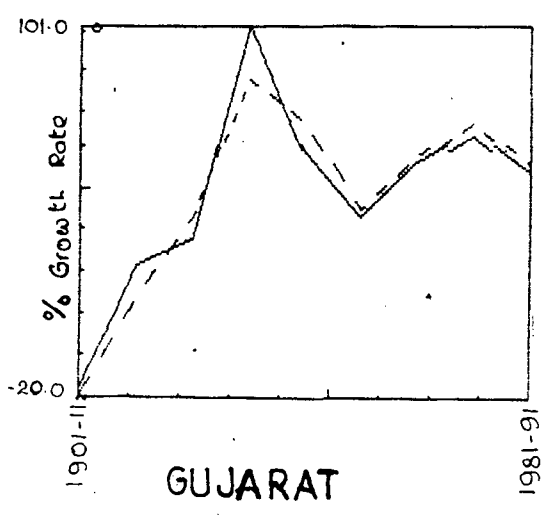
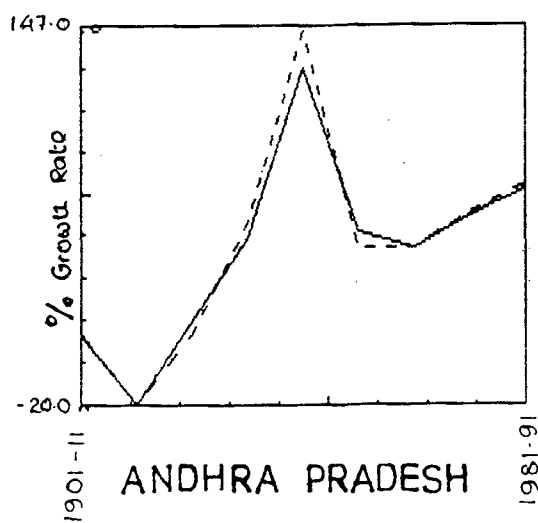
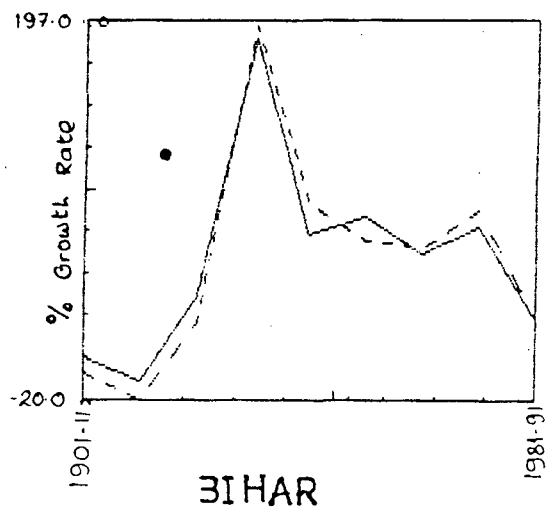
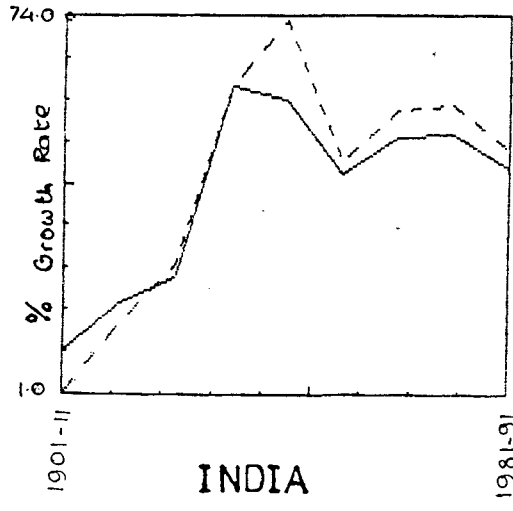
plotted on the graph which is given on the figure No.9. At all India level in Class-I cities growth rate of males remained higher than female in 1901-11, 1911-21 and 1931-41 period and in rest of the decades female growth rate became excess over male growth rate. The period of 1941-51 has reported the excess of female growth rate over male growth rate and the difference is the highest during the whole period. This may be due to the large number of persons dislocation during the course of division of country in 1947. During this period growth rate of females in Punjab was 12 per cent higher than male. Since 1971 maximum states have registered higher female growth rate. The differential growth rates of male and female population in Class-I cities have somewhat resembling pattern with the number of cities which have been added from one decade to another, because in some states, the number of Class-I cities has doubled during the period of ten years (Table No.16).

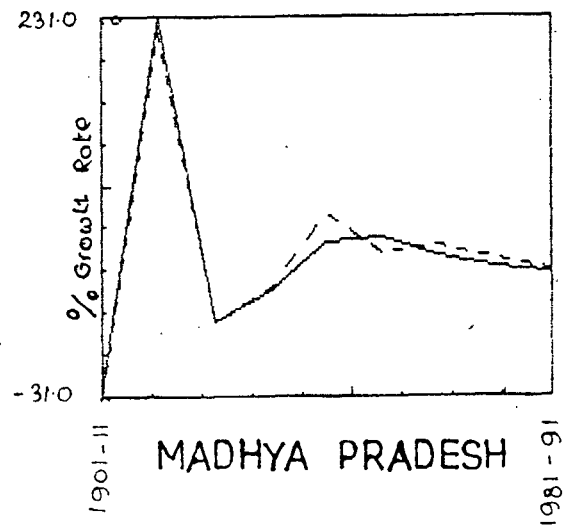
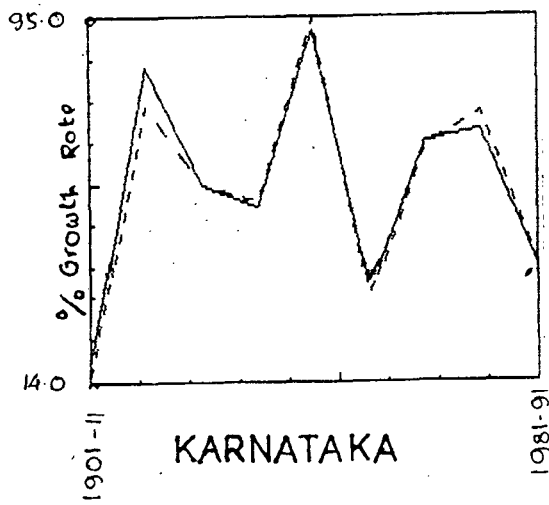
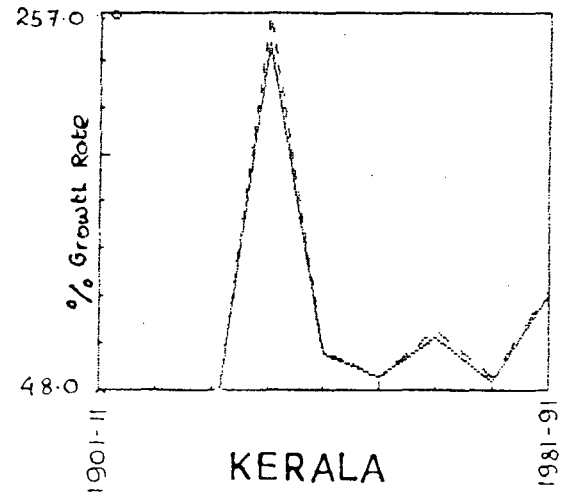
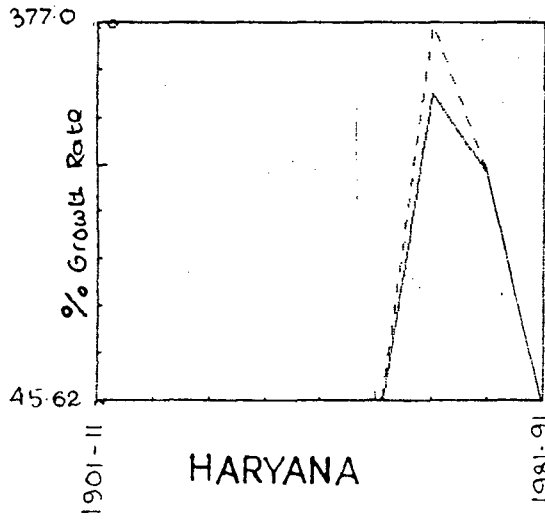
3.3) Sex ratio of initial population and at the end of decade in Class-I cities:

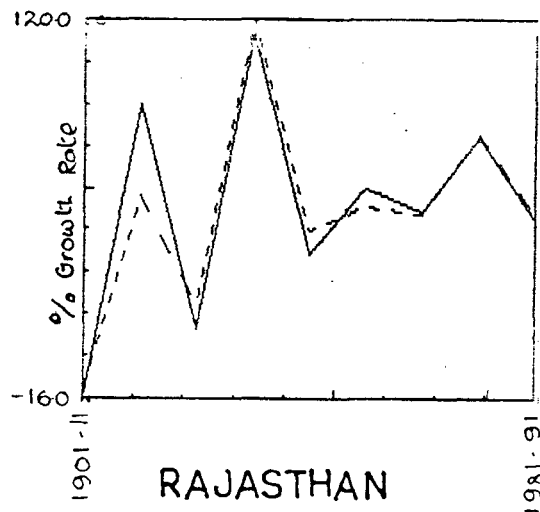
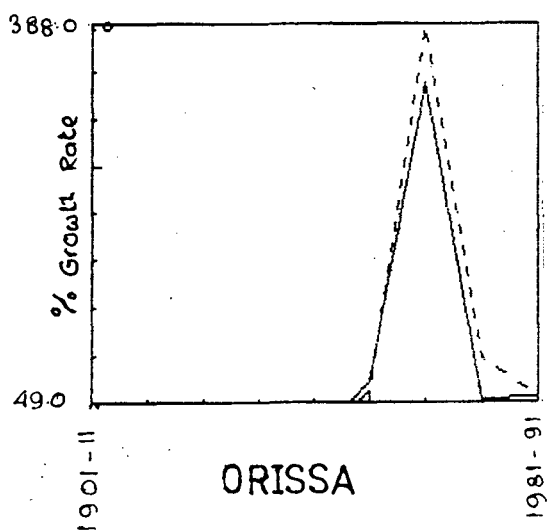
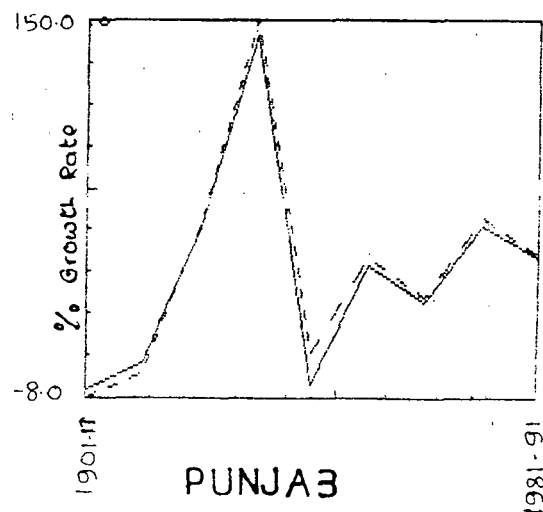
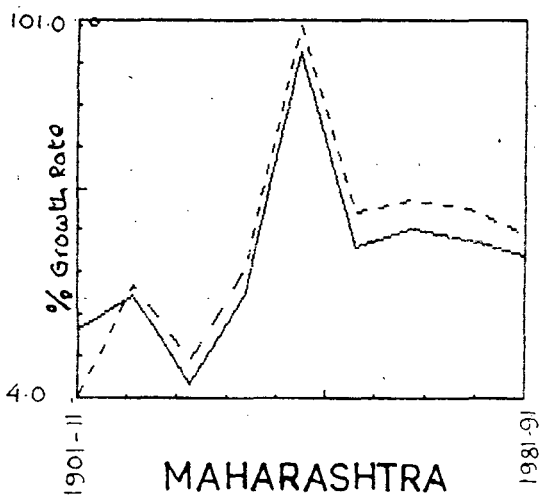
To establish the relationship between the growth of Class-I cities and their sex ratio, the comparison has been made between the sex ratio of initial population (previous decade) and during the end of the decade (coming decade). Sex ratio for the end of the decade has been calculated from

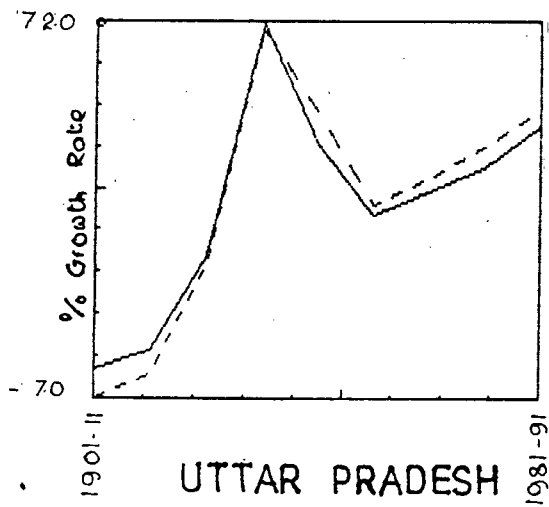
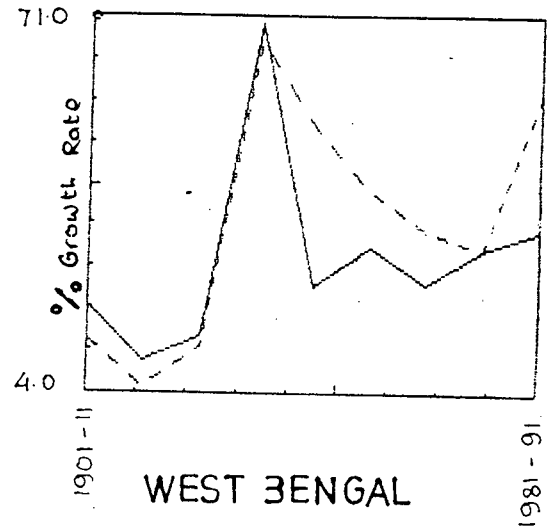
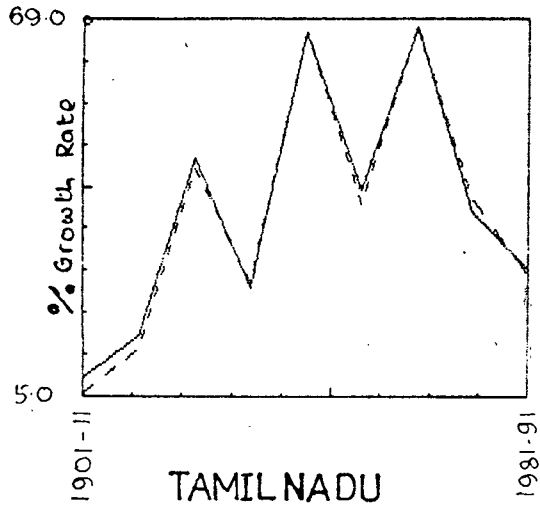
TRENDS IN CLASS-I CITIES POPULATION GROWTH RATES BY SEX

INDIA AND MAJOR STATES, 1901-1991.









--- FEMALES
 — MALES

TABLE NO: 17.
SEX RATIOS AMONG THE TOTAL POPULATION, LIFETIME
MIGRANTS, CURRENT MIGRANTS, AND NON-MIGRANTS BY CITY
CHARACTERISTIC, INDIA, 1971.

CITY CHARACTERISTICS	CITIES (N)	TOTAL POPUL.	1	2	3
All cities	147	115	107	145	121
City size					
1,000,000+	9	123	138	151	116
500,000-999,999	10	117	111	160	120
200,000-499,999	54	117	113	150	119
100,000-199,999	74	113	98	139	123
Growth rate					
High	68	117	114	142	118
Medium	51	115	103	145	123
Low	26	113	93	149	124
Functional specialization					
Manufacturing	68	115	105	146	122
Trade&transport	58	114	106	140	120
Service	21	120	116	157	121
Length of existence as class-I city					
Before 1901	25	120	122	160	119
1901-41	14	112	100	148	119
After 1941	87	113	102	140	121
New cities	10	131	134	150	126
Regional type					
Himalayan	06	120	135	180	111
Upper Ganga plains	24	119	107	149	128
Middle & Lower Ganga plains	21	124	109	166	132
Central India plateau	27	119	111	150	124
Deccan plateau	35	111	104	141	116
Coastal plains	34	108	100	124	113

1. LIFETIME MIGRANTS, 2. CURRENT MIGRANTS, 3. NON-MIGRANTS.

SOURCE: M.K.Premi & Judith Ann L. Tom,
City characteristics, migration, and urban
development policies in India, Papers of the
East-West Population Institute, No.92

the actual growth of male-female population. This period has been taken from 1961 to 1991. Analysis shows that every increment in the population for new decade, increases the sex ratio. For all the states, this ratio is going in favour of females. Sex ratio for the period of 1981-91 in West Bengal has gone to 1234, where the sex ratio of previous population was 792. It shows that the trend of migration even towards the big cities is changing. As earlier, the migration stream was dominated largely by males (Appendix No.4). Premi has analysed the sex ratio of migrants on the basis of time for 1971. He concluded that, "the sex ratio of current migrants (145) was significantly higher than that of life time migrants (107) or the total population (115), indicating that in the initial stages migration to cities is male selective. He analysed the census data for 1971, for total and migrant populations by city characteristics which shows that sex ratios were higher for the life time migrants to the metropolises (Table No.17). They were also higher in the new cities or those situated in the Himalayan region. The reasons for this higher male selectivity in migrant populations of cities belonging to these categories are mostly economic. The sex ratio of the life time migrants to the cities in the smallest size category (population of 100,000-199,999) was less than 100. It was also less than 100 in cities with low

growth rates and cities of the coastal plains (Here sex ratio is taken males per 100 females)"⁷

After analyzing the trend of sex ratio for total, urban and class-I cities, it can be concluded that the regional differences in sex ratio have common pattern. As the general sex ratio in Southern India is high, here USR and Class-I cities sex ratio is also high. This may be due to the different socio-economic set up in the society. Many writers have given their views that this is due to the patriarchal and matrilineal system and due to the preference of son, neglect of female in the society are major cause of declining sex ratio in general as well as urban population because they are considered burden and even the opportunities for females are very few in urban areas. They cannot migrate alone, because of the fact that security of female is not proper. Male cannot carry their family due to the high cost of living in urban areas. But slowly, these hurdles are no more in excess as the increasing trend of urban sex ratio reported.

7. M.K. Premi and Judith Ann L. Tom, City Characteristics, Migration, and Urban Development Policies in India, Papers of the East-West Population Institute, no.92, East-West Centre, Honolulu, Hawaii, 1985, pp.37-39.

CHAPTER - III

FACTORS INFLUENCING URBAN SEX RATIO

Here an attempt has been made to analyse the factors, which are related with the urban sex ratio. This chapter has been divided into two parts. Part one deals with the relationship among variables, which have been analysed with the help of correlation matrices. Part two of this chapter deals with the sex ratio and its determinants which predict the change in sex ratio.

i) Relationship among the variables:

This part investigates the causal relationship between the urban sex ratio and the variables, which are related with the status of women. The status of women here considered as the involvement of these in every sphere of development and decision making processes. Basically, urban sex ratio is influenced by the sex selective migration. The structure of Indian social system is like that, women cannot migrate alone. The basic reason is the security of females in a strange place, where the whole atmosphere is different from their native place. In other words, it can be confirmed by the work participation of females in urban areas. In agriculture sector, where the recognition of work is not important, females participation in productive

TABLE NO. 18
CORRELATION MATRICES FOR MAJOR STATES, 1971.

	IMR	TFR	MAM	LR	FWPR	SR
IMR	1.0000	0.2483	0.1107	-0.1271	0.0674	0.2364
TFR		1.0000	-0.6087	-0.7628	-0.6147	-0.4920
MAM			1.0000	0.8754	0.4009	0.3814
LR				1.0000	0.5756	0.3588
FWPR					1.0000	0.6962
SR						1.0000

TABLE NO. 19
CORRELATION MATRICES FOR MAJOR STATES, 1981.

	IMR	TFR	MAM	LR	FWPR	SR
IMR	1.0000	0.4015	-0.0522	-0.3486	-0.0285	0.0239
TFR		1.0000	-0.6274	-0.8454	-0.6773	-0.6471
MAM			1.0000	0.7612	0.3112	0.4755
LR				1.0000	0.5657	0.5502
FWPR					1.0000	0.7169
SR						1.0000

IMR- Infant mortality Rate, TFR-Total Fertility Rate,
MAM- Female Mean Age at Marriage, LR- Female Literacy Rate,
FWPR- Female Work Participation Rate, SR-Urban Sex Ratio.

activity is very high but in urban areas only selected jobs are available for them. Not only the security of jobs but the wage differential and working hours are also different from males. Not only in work participation, women's are being discriminated but it can be seen at different levels. The number of children, to whom a woman has to rear, is a direct responsibility to her. The age at marriage, which is still low in comparison to western countries, increases the chances of more children due to the long period of reproduction. There is a remarkable gap between male and female literacy rate. Literacy among women has frequently been mentioned as an important contributory factor to the changing attitude among women to their traditional role as home maker and bearer of children. Education is an important factor governing the utilization of public health services, thereby reducing the mortality and raising life expectancy. During the process of development, women are denied the jobs but as economy take off, as in the case of western countries, the role of women also becomes important. Taking these factors into consideration, some relationship is expected among these variables.

Correlation matrices have been calculated for 1971 and 1981 period for the urban areas for major states (Table Nos.18-19).

For the period 1971 and 1981, the female work participation rate has shown significant positive correlation with urban sex ratio at 1 per cent level of significance. Infant mortality does not show any correlation, where, theoretically speaking, it is considered good indicator of health and development. That is why it has been taken into consideration. It does not have any relationship with urban sex ratio even in 1981. Mean age at marriage and literacy rates are significantly related at 1 per cent level of significance for 1971 and 1981. There is also negative correlation between literacy rate and total fertility rate and both variables significantly related at 5 per cent level of significance. Literacy rate and mean age at marriage also have positive relationship and both are significantly related at 5 per cent level of significance for 1971 and 1981. Female work participation rate and total fertility rate have negative relationship and both are significantly related at 5 per cent level of significance for 1971 and 1981. Urban sex ratio and total fertility rate are significantly related in 1981.

Empirically, in the exercise of correlation, the propositions are almost true in all cases except infant mortality which does not have any relationship. Total fertility rate and female work participation rates are significantly related at 10 per cent level of significance.

Table No.21 Urban sex-ratio for Population Size Class Categories. 300 Class-I cities. 1991.

Population size Class Category	No. of UAS/ Cities	% Population in Class	Sex-Ratio
M-1 100,000-199,999	167	16.42	913
M-2 100,000-299,999	40	6.88	904
M-3 300,000-499,999	40	11.15	906
M-4 500,000-999,999	30	14.98	881
M-5 1,000,000 and above	23	50.57	864
(1) 1,000,000-1,999,999	14	12.29	882
(2) 2,000,000-4,999,999	5	11.64	897
(3) 5,000,000 and above	4	26.64	842
Entire Class-I	300	100.00	882

These two factors are most important, which show the high variability in urban sex ratio. Since percentage of female workers in secondary and tertiary sectors explains the maximum variance, from this one can infer that the job opportunities for females in urban areas will attract more female from country side and which, in reverse, will raise the proportion of females.

Table No.20 Correlation between USR and size of Class-I cities, India, 1981 and 1991.

Year	Value of Correlation
1981	-0.1195*
1991	-0.1102

* -0.01 level of significance.

The correlation has also been calculated between the urban sex ratio and size of city for the class-I cities for 1981 and 1991 (Appendix-5). Here the proposition was that there is an inverse relationship between urban sex ratio and size of the city. This relationship was significant during the period 1981 but does not remain same during the 1991 (Table No.20). But this does not mean that this hypothesis is wrong. This can be substantiated by dividing the million cities (Table No.21) in different sizes. Sex ratio decreases as the size of city increases and it comes down from 913 for the M-1 and 842 for 5,000,000 and above.

TABLE No. 22
RESULTS OF STEP-WISE REGRESSION ANALYSIS, MAJOR STATES, 1971.

Var.	Rrgres. Co-eff.	S.E.	t	R^2 R	\bar{R}^2 R	F
STEP-I						
FWPR	15.0076	4.4668	3.360	0.4847	0.4418	11.2883
STEP-II						
FWPR	14.7310	4.50933	3.267	0.5208	0.4337	5.9774
IMR	0.3609	0.3966	0.910			
STEP-III						
FWPR	11.7010	6.0723	1.927	0.5472	0.4113	4.0285
IMR	0.48324	0.4349	1.111			
TFR	-19.3427	25.325	-0.764			
STEP-IV						
FWPR	12.4876	6.3701	1.960	0.5676	0.3754	2.9538
IMR	0.49551	0.4483	1.105			
TFR	-32.5833	33.061	-0.986			
LR	-1.6531	2.5359	-0.652			
STEP-V						
FWPR	15.2993	6.8570	2.231	0.6210	0.3842	2.6222
IMR	0.2008	0.5246	0.383			
TFR	-30.1344	32.909	-0.916			
LR	-5.9482	4.764	-1.249			
MAM	35.0236	32.978	1.062			

TABLE No. 23
RESULTS OF STEP-WISE REGRESSION ANALYSIS, MAJOR STATES, 1981.

Var.	Rrgres. Co-eff.	S.E.	t	R ²	\bar{R}^2	F
STEP-I						
FWPR	13.3277	3.7418	3.562	0.5139	0.4734	12.6864
STEP-II						
FWPR	11.7111	3.8025	3.080	0.5844	0.5088	7.7343
MAM	17.9663	13.151	1.366			
STEP-III						
FWPR	10.4272	5.2192	1.998	0.5902	0.4673	4.8018
MAM	14.1217	17.054	0.828			
TFR	-9.4290	24.971	-0.378			
STEP-IV						
FWPR	8.7575	6.0065	1.458	0.6074	0.4329	3.4815
MAM	9.5256	19.064	0.500			
TFR	-22.0003	32.636	-0.674			
IMR	0.3236	0.5157	0.627			
STEP-V						
FWPR	9.2026	6.5303	1.409	0.6113	0.3684	2.5167
MAM	13.9812	25.523	0.548			
TFR	-26.0703	37.311	-0.699			
IMR	0.2748	0.570	0.481			
LR	-.8066	2.843	-.284			

ii) Regression results:

As variables are inter-related, one expects that there would be multi-collinearity among the variables. To avoid this problem, stepwise regression method has been used. As first variable; female work participation rate entered into the equation it gives positive results and explains the maximum proportion of variations in urban sex ratio. But in second step, as the IMR is not related, the value of R^2 does not give much variation, even the value of R^{-2} becomes low. Due to this the exercise is left here only for 1971 (Table No.22).

For the period of 1981, female work participation and mean age at marriage explains the maximum variation in urban sex ratio but in step number three the value of R^{-2} becomes low and the significance of regression coefficients do not remain consistent (Table No.23). Thus the relationship given in step number two is taken as optimal fit, the sudden fall in the regression coefficient in step three in comparison to step two shows the multi-collinearity between female work participation rate and total fertility rate (-0.6773*). This multi-collinearity has disturbed the standard error to a greater extent.

If one looks at the pattern of female work participation rate and urban sex ratio (Table No.24) in 1971

Table No. 24: Ex-planatory variables, India & Major States (1971)

	Urban Sex Ratio	IMR	TFR	Mean age at Marriage	Literacy Rate	FWPR
India	858	82	4.68	16.76	48.73	8.35
Andhra Pradesh	949	65	4.12	15.51	41.96	11.20
Bihar	807	N.A.	6.00	15.62	37.35	4.54
Gujarat	893	110	5.01	17.51	51.81	8.63
Haryana	853	58	4.81	16.66	48.14	4.72
Karnataka	973	54	4.31	16.76	48.27	10.93
Kerala	997	48	3.68	18.93	69.33	13.46
Madhya Pradesh	868	79	5.51	15.54	43.77	8.90
Maharashtra	820	88	4.72	17.20	54.98	10.60
Orissa	845	84	5.25	16.54	42.53	8.31
Punjab	856	76	4.45	17.86	52.13	4.48
Rajasthan	875	82	5.46	15.08	34.94	5.03
Tamilnadu	951	77	3.99	18.04	52.16	10.15
Uttar Pradesh	821	119	5.92	16.55	39.07	4.63
West Bengal	751	N.A.	3.99	16.67	54.11	6.35

Table No. 25 Ex-planatory variables, India & Major States.
(1981)

	Urban Sex Ratio	IMR	TFR	Mean age at Marriage	Literacy Rate	FWPR
India	878	62	3.71	17.58	54.38	9.00
Andhra Pradesh	948	52	3.38	16.72	47.22	10.91
Bihar	832	N.A.	4.87	16.63	45.96	4.68
Gujarat	905	89	3.89	17.83	58.18	7.00
Haryana	849	52	4.05	17.55	54.11	6.09
Karnataka	926	45	3.56	17.74	54.32	11.72
Kerala	1021	24	2.31	19.11	79.81	12.55
Madhya Pradesh	884	80	4.32	16.85	48.71	9.73
Maharashtra	850	49	3.54	17.66	62.07	11.72
Orissa	859	68	4.14	17.03	49.00	9.36
Punjab	865	51	3.73	19.11	56.38	5.78
Rajasthan	877	53	4.37	16.59	39.89	5.6
Tamilnadu	956	55	2.92	18.83	60.45	12.03
Uttar Pradesh	846	97	5.00	17.46	40.98	4.32
West Bengal	819	N.A.	2.82	17.55	60.72	6.56

and 1981 (Table No.25); Kerala is the ^{only} state which shows the highest female work participation rate and highest sex ratio among all the states. All indicators show the positive development in Kerala. The female work participation rate and fertility rate are the two variables which are significantly related at 1% level of significance. Most of the states which have reported high female work participation rate also have high sex ratio. It can be seen in the case of Andhra Pradesh, Maharashtra, Tamilnadu and Madhya Pradesh. Basically, southern states of India do not have much difference in rural-urban sex ratio except Maharashtra because of the cultural reasons.

CHAPTER - IV

Summary and Conclusion

Several authors have given different views regarding the changes in sex-ratio from the very beginning of this century which are as follows:

- (i) Sex selective migration;
- (ii) Sex differentials in under-enumeration;
- (iii) Sex ratio at birth;
- (iv) Sex differentials in mortality; and
- (v) Socio-economic factors.

All the above mentioned have been analyzed on the basis of existing literature and also on the basis of the availability of data and feasibility to analyse them.

The general sex ratio has declined from 972 to 929 between the period of 1901 to 1991. Northern zone never recorded sex ratio above 900, but it has shown improvement over the period. Southern zone has remained above the national average since the beginning of this century although it has shown continuous decline in the sex ratio and moving towards the national average. Eastern zone has also reported higher sex ratio than the national average

till 1981 but after that it has also come down. The most important feature is that all these zones are coming close to each other over a period of time, where the large gap is breaking.

At state level, the pattern of general sex ratio remained same. The states which were above national average in 1901 remained at the same level in 1991 also, and the states which have reported sex ratio below national average remained below it, except Bihar, which reported sex ratio below national average in 1991. Punjab is the only state which has shown her sex ratio lowest since 1901 to 1981 but it was replaced by Utter Pradesh in 1991.

If one looks at the trend of male-female growth rate differences and pattern of change in sex ratio, it has shown clear relationship. The high range of growth rate difference also explains the migration trend in that state to which growth rate is related. The wide range of male-female difference cannot be due to the natural increase.

The most interesting phenomenon is the improvement of urban sex ratio on one hand and the decline in the general sex ratio on the other. At state level also, there is an

improvement in urban sex ratio in all the major states except Tamilnadu, which required further probe, but in general sex ratio only few states has shown signs of improvement. The year 1961 is the turning point for the urban sex ratio. After this period it has shown improvement in the urban sex ratio.

The relationship between the growth rate of male-female and urban sex ratio is quite remarkable. After 1961, in most of the states female growth rate has been reported higher than male growth rate which is translated in to the improvement of urban sex ratio of these states.

In class-I cities, the sex ratio has shown improvement. The sex ratio in different classes of India has shown improvement except class-IV and V. But difference in their sex ratio is narrowing down.

The most important and interesting thing is that the sex ratio of class-I cities is improving at a faster rate. The explanation for the trend may be the pattern of migrational stream which have shown change over a time. Now, the migration is not much sex selective. This improvement is due to the household migration, which is

mainly due to various socio-economic and political reasons. The growth rate of females is higher than the male growth rate in Class-I cities. If one looks at India as a whole, the sex ratio of Class-I cities has reported improvement since 1941 onward. But at state level the improvement in class-I cities sex ratio have taken place at different times. Tamilnadu has reported decline in the sex ratio of class-I cities.

To bring out the impact of migration on sex ratio in class-I cities, the absolute growth of population by sex have been calculated. Here the sex ratio of initial population and sex ratio of the population at the end of period, has been compared. The sex ratio of additional population was found remarkably higher than the sex ratio of initial population which can be explained by the change in migratory streams. It means that the proportion of females in total migration to urban areas has improved over time. This trend has been registered in all the states except Tamilnadu where it has reported decline by 40 points.

In regard to the explanatory variables, female work participation rate and total fertility rate have significant correlation and attribute maximum change in urban sex ratio.

In case of mean age at marriage literacy rate, both of these variables explain the variation in sex ratio but it is not significant. In the case of infant mortality rate, theoretically speaking, it should explain the change in urban sex ratio but empirically the results are not same as it was expected. The relationship between urban sex ratio and size of the city is also significant for 1981 but for 1991, this is not significant.

The questions which remained unanswered are - Whether change in urban sex ratio is due to the improving migration of females? What is the nature of Migration? Whether it is household migration or single move? And the last question is, why there is a decline in the urban sex ratio in Tamilnadu state? These aspects can be taken for further research.

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APPENDICES

APPENDIX-1
Trends in general population growth rates by sex,
India and major states, 1901 - 1991.

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
INDIA					
1901	120791301	117358672	—	—	—
1911	128385368	123708022	6.29	5.41	0.88
1921	128546225	122774988	0.13	-0.75	0.88
1931	142929689	135788921	11.19	10.60	0.59
1941	163685302	154690267	14.52	13.92	0.60
1951	185528462	175559628	13.34	13.49	-0.15
1961	226293201	212941570	21.97	21.29	0.68
1971	284049276	264110376	25.52	24.03	1.49
1981	354397884	330786808	24.77	25.25	-0.48
1991	437805805	406518417	23.54	22.89	0.64
ANDHRA PRADESH					
1901	9607091	9458830	—	—	—
1911	10769322	10678090	12.10	12.89	-0.79
1921	10749220	10671228	-0.19	-0.06	-0.12
1931	12183673	12019900	13.34	12.64	0.71
1941	13782365	13506975	13.12	12.37	0.75
1951	15670565	15444694	13.70	14.35	-0.65
1961	18161671	17821776	15.90	15.39	0.51
1971	22008663	21494045	21.18	20.61	0.58
1981	27108922	26440751	23.17	23.01	0.16
1991	33637906	32716653	24.08	23.74	0.35

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF
	MALE	FEMALE	MALE	FEMALE	(M - F)
1	2	3	4	5	6
BIHAR					
1901	13294266	14017599	—	—	—
1911	13854679	14459602	4.22	3.15	1.06
1921	13954010	14172665	0.72	-1.98	2.70
1931	15724503	15622605	12.69	10.23	2.46
1941	17622539	17548301	12.07	12.33	-0.26
1951	19489964	19292307	10.60	9.94	0.66
1961	23297343	23150114	19.54	20.00	-0.46
1971	28846944	27506425	23.82	18.82	5.00
1981	35930560	33984174	24.56	23.55	1.01
1991	45147280	41191573	25.65	21.21	4.44
GUJRAT					
1901	4654875	4439873	—	—	—
1911	5037852	4765735	8.23	7.34	0.89
1921	5233462	4941527	3.88	3.69	0.19
1931	5906646	5583182	12.86	12.98	-0.12
1941	7060352	6641199	19.53	18.95	0.58
1951	8331922	7930735	18.01	19.42	-1.41
1961	10633902	9999448	27.63	26.08	1.54
1971	13802494	12894981	29.80	28.96	0.84
1981	17552640	16533159	27.17	28.21	-1.04
1991	21271102	19903241	21.18	20.38	0.80

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
HARYANA					
1901	2476398	2146681	—	—	—
1911	2274916	1899774	-8.14	-11.50	3.37
1921	2307992	1947913	1.45	2.53	-1.08
1931	2473236	2086695	7.16	7.12	0.03
1941	2821792	2451053	14.09	17.46	-3.37
1951	3031626	2641988	7.44	7.79	-0.35
1961	4062797	3527746	34.01	33.53	0.49
1971	5377258	4659550	32.35	32.08	0.27
1981	6909938	6012680	28.50	29.04	-0.54
1991	8705379	7612336	25.98	26.60	-0.62
KARNATAKA					
1901	6582105	6472649	—	—	—
1911	6827801	6697450	3.73	3.47	0.26
1921	6793718	6583881	-0.50	-1.70	1.20
1931	7445458	7187534	9.59	9.17	0.42
1941	8294043	7961325	11.40	10.77	0.63
1951	9866923	9535033	18.96	19.77	-0.80
1961	12040923	11545849	22.03	21.09	0.94
1971	14971900	14327114	24.34	24.09	0.25
1981	18922627	18213087	26.39	27.12	-0.74
1991	22846613	21959855	20.74	20.57	0.17

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
KERALA					
1901	3191466	3204796	—	—	—
1911	3559425	3588248	11.53	11.96	-0.44
1921	3879458	3922669	8.99	9.32	-0.33
1931	4702951	4804099	21.23	22.47	-1.24
1941	5443296	5588245	15.74	16.32	-0.58
1951	6681901	6867217	22.75	22.89	-0.13
1961	8361927	8541788	25.14	24.39	0.76
1971	10587851	10759524	26.62	25.96	0.66
1981	12527767	12925913	18.32	20.13	-1.81
1991	14230391	14802437	13.59	14.52	-0.93
MADHYA PRADESH					
1901	8472749	8388019	—	—	—
1911	9791291	9649674	15.56	15.04	0.52
1921	9713414	9458336	-0.80	-1.98	1.19
1931	10822587	10533070	11.42	11.36	0.06
1941	12180012	11810596	12.54	12.13	0.41
1951	13255004	12816633	8.83	8.52	0.31
1961	16578204	15794204	25.07	23.23	1.84
1971	21455334	20198785	29.42	27.89	1.53
1981	26886305	25292539	25.31	25.22	0.09
1991	34232048	31903814	27.32	26.14	1.18

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
MAHARASTRA					
1901	9802129	9589514	—	—	—
1911	10922671	10551852	11.43	10.04	1.40
1921	10692865	10156801	-2.10	-3.74	1.64
1931	12305958	11653342	15.09	14.73	0.35
1941	13769460	13063298	11.89	12.10	-0.21
1951	16490039	15512525	19.76	18.75	1.01
1961	20428882	19124836	23.89	23.29	0.60
1971	26116351	24295884	27.84	27.04	0.80
1981	32415126	30369045	24.12	25.00	-0.88
1991	40686254	38061961	25.52	25.33	0.18
ORISSA					
1901	5058100	5244817	—	—	—
1911	5535632	5843243	9.44	11.41	-1.97
1921	5350227	5808359	-3.35	-0.60	-2.75
1931	6042255	6448801	12.93	11.03	1.91
1941	6706487	7061501	10.99	9.50	1.49
1951	7242892	7403054	8.00	4.84	3.16
1961	8770586	8778260	21.09	18.58	2.52
1971	11041083	10903532	25.89	24.21	1.68
1981	13309786	13069485	20.55	19.86	0.68
1991	15979904	15532166	20.06	18.84	1.22

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YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
PUNJAB					
1901	4118386	3426404	—	—	—
1911	3782236	2949274	-8.16	-13.93	5.76
1921	3976180	3176631	5.13	7.71	-2.58
1931	4415292	3597033	11.04	13.23	-2.19
1941	5228280	4371956	18.41	21.54	-3.13
1951	4968206	4192294	-4.97	-4.11	-0.86
1961	6007566	5127503	20.92	22.31	-1.39
1971	7266515	6284545	20.96	22.57	-1.61
1981	8937210	7851705	22.99	24.94	-1.95
1991	10695136	9495659	19.67	20.94	-1.27
RAJASTHAN					
1901	5403989	4890101	—	—	—
1911	5756206	5227303	6.52	6.90	-0.38
1921	5429378	4863270	-5.68	-6.96	1.29
1931	6160610	5587364	13.47	14.89	-1.42
1941	7274679	6589180	18.08	17.93	0.15
1951	8313883	7656891	14.29	16.20	-1.92
1961	10564082	9591520	27.07	25.27	1.80
1971	13484303	12281423	27.64	28.04	-0.40
1981	17854154	16407708	32.41	33.60	-1.19
1991	22935895	20944745	28.46	27.65	0.81

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
TAMILNADU					
1901	9419398	9833232	—	—	—
1911	10236951	10665665	8.68	8.47	0.21
1921	10659489	10969029	4.13	2.84	1.28
1931	11577988	11894111	8.62	8.43	0.18
1941	13056967	13210540	12.77	11.07	1.71
1951	15003724	15115323	14.91	14.42	0.49
1961	16910978	16775975	12.71	10.99	1.73
1971	20828021	20371147	23.16	21.43	1.73
1981	24487624	23920453	17.57	17.42	0.15
1991	28217947	27420371	15.23	14.63	0.60
UTTAR PRADESH					
1901	25098994	23528661	—	—	—
1911	25144159	23010749	0.18	-2.20	2.38
1921	24452475	22199235	-2.75	-3.53	0.78
1931	26148359	23631179	6.94	6.45	0.49
1941	29640728	26894426	13.36	13.81	-0.45
1951	33100719	30118936	11.67	11.99	-0.32
1961	38638307	34116247	16.73	13.27	3.46
1971	47016421	41324723	21.68	21.13	0.55
1981	58819276	52042737	25.10	25.94	-0.83
1991	73898286	65132844	25.64	25.15	0.48

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
WEST BENGAL					
1901	8708978	8231110	—	—	—
1911	9349419	8649350	7.35	5.08	2.27
1921	9173148	8301200	-1.89	-4.03	2.14
1931	9997035	8900001	8.98	7.21	1.77
1941	12545269	10684283	25.49	20.05	5.44
1951	14105519	12194461	12.44	14.13	-1.70
1961	18599144	16327135	31.86	33.89	-2.03
1971	23435987	20876024	26.01	27.86	-1.86
1981	28560901	26019746	21.87	24.64	-2.77
1991	35461898	32520834	24.16	24.99	-0.82

APPENDIX-2
Trends in Urban population growth rates by sex,
India and major states, 1901-1991.

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF
	MALE	FEMALE	MALE	FEMALE	(M - F)
1	2	3	4	5	6
INDIA					
1901	13461725	12267933	—	—	—
1911	13799197	12049520	2.51	-1.78	4.29
1921	15136164	12822896	9.69	6.42	3.27
1931	18098079	15195744	19.57	18.50	1.06
1941	23987110	19958120	32.54	31.34	1.20
1951	33370832	28728046	39.12	43.94	-4.82
1961	42318869	35836446	26.81	24.74	2.07
1971	57990224	49834531	37.03	39.06	-2.03
1981	83876403	73803768	44.64	48.10	-3.46
1991	114700656	102476969	36.75	38.85	-2.10
ANDHRA PRADESH					
1901	920266	919484	—	—	—
1911	1082646	1002449	17.64	9.02	8.62
1921	1101307	1086010	1.72	8.34	-6.61
1931	1370086	1324061	24.41	21.92	2.49
1941	1856296	1809632	35.49	36.67	-1.19
1951	2728239	2692086	46.97	48.76	-1.79
1961	3215959	3058549	17.88	13.61	4.26
1971	4310416	4092111	34.03	33.79	0.24
1981	6411295	6076281	48.74	48.49	0.25
1991	9102189	8710504	41.97	43.35	-1.38

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
BIHAR					
1901	549244	547741	—	—	—
1911	556364	521522	1.30	-4.79	6.08
1921	623692	542233	12.10	3.97	8.13
1931	784401	637970	25.77	17.66	8.11
1941	1039785	861317	32.56	35.01	-2.45
1951	1425416	1200845	37.09	39.42	-2.33
1961	2161157	1752763	51.62	45.96	5.66
1971	3117957	2516009	44.27	43.55	0.73
1981	4760004	3958986	52.66	57.35	-4.69
1991	6158543	5210346	29.38	31.61	-2.23
GUJRAT					
1901	1033352	997386	—	—	—
1911	962470	924305	-6.86	-7.33	0.47
1921	1061603	988736	10.30	6.97	3.33
1931	1217891	1137118	14.72	15.01	-0.29
1941	1717978	1541977	41.06	35.60	5.46
1951	2306282	2121634	34.24	37.59	-3.35
1961	2803680	2512944	21.57	18.44	3.12
1971	3960011	3536489	41.24	40.73	0.51
1981	5565968	5035685	40.55	42.39	-1.84
1991	7421328	6742973	33.33	33.90	-0.57

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
HARYANA					
1901	300922	273152	—	—	—
1911	244090	205614	-18.89	-24.73	5.84
1921	265668	215527	8.84	4.82	4.02
1931	315182	249561	18.64	15.79	2.85
1941	390881	315064	24.02	26.25	-2.23
1951	524789	443705	34.26	40.83	-6.57
1961	710065	597615	35.30	34.69	0.62
1971	957033	815926	34.78	36.53	-1.75
1981	1528972	1298415	59.76	59.13	0.63
1991	2165421	1879749	41.63	44.77	-3.15
KARNATAKA					
1901	829968	809932	—	—	—
1911	798166	765606	-3.83	-5.47	1.64
1921	951009	889678	19.15	16.21	2.94
1931	1161910	1077224	22.18	21.08	1.10
1941	1423062	1330905	22.48	23.55	-1.07
1951	2294065	2159415	61.21	62.25	-1.05
1961	2753263	2513230	20.02	16.38	3.63
1971	3722691	3399402	35.21	35.26	-0.05
1981	5570227	5159379	49.63	51.77	-2.14
1991	7176753	6673949	28.84	29.36	-0.51

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
KERALA					
1901	232753	221746	—	—	—
1911	268100	256561	15.19	15.70	-0.51
1921	347824	333076	29.74	29.82	-0.09
1931	466646	449684	34.16	35.01	-0.85
1941	604130	591420	29.46	31.52	-2.06
1951	916671	909161	51.73	53.73	-1.99
1961	1282759	1271382	39.94	39.84	0.10
1971	1735501	1730948	35.29	36.15	-0.85
1981	2360350	2410925	36.00	39.28	-3.28
1991	3775183	3901188	59.94	61.81	-1.87
MADHYA PRADESH					
1901	752590	705455	—	—	—
1911	678973	620034	-9.78	-12.11	2.33
1921	767039	673173	12.97	8.57	4.40
1931	946331	825540	23.37	22.63	0.74
1941	1250286	1102491	32.12	33.55	-1.43
1951	1642627	1490310	31.38	35.18	-3.80
1961	2493166	2184068	51.78	46.55	5.23
1971	3631923	3152844	45.68	44.36	1.32
1981	5619984	4966475	54.74	57.52	-2.79
1991	8108077	7239970	44.27	45.78	-1.50

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
MAHARASTRA					
1901	1728173	1489029	—	—	—
1911	1809320	1439669	4.70	-3.31	8.01
1921	2172258	1685068	20.06	17.05	3.01
1931	2490231	1966499	14.64	16.70	-2.06
1941	3129709	2535402	25.68	28.93	-3.25
1951	5091217	4109746	62.67	62.09	0.58
1961	6197948	4964613	21.74	20.80	0.94
1971	8634331	7076880	39.31	42.55	-3.24
1981	11887670	10105924	37.68	42.80	-5.12
1991	16259194	14237158	36.77	40.88	-4.11
ORISSA					
1901	129472	125212	—	—	—
1911	141299	133860	9.13	6.91	2.23
1921	143392	138106	1.48	3.17	-1.69
1931	164907	152347	15.00	10.31	4.69
1941	215477	197051	30.67	29.34	1.32
1951	315876	278194	46.59	41.18	5.42
1961	613988	495662	94.38	78.17	16.20
1971	1000060	845335	62.88	70.55	-7.67
1981	1673382	1436905	67.33	69.98	-2.65
1991	2267748	1964707	35.52	36.73	-1.21

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH RATE MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
PUNJAB					
1901	518109	416657	—	—	—
1911	467271	345953	-9.81	-16.97	7.16
1921	501147	368379	7.25	6.48	0.77
1931	679049	489364	35.50	32.84	2.66
1941	946913	710501	39.45	45.19	-5.74
1951	1101113	888154	16.28	25.00	-8.72
1961	1412578	1154728	28.29	30.01	-1.73
1971	1733040	1483139	22.69	28.44	-5.75
1981	2492746	2155011	43.84	45.30	-1.46
1991	3208590	2792292	28.72	29.57	-0.85
RAJASTHAN					
1901	796476	754180	—	—	—
1911	762187	713642	-4.31	-5.38	1.07
1921	777901	697434	2.06	-2.27	4.33
1931	908687	820518	16.81	17.65	-0.84
1941	1115857	1001244	22.80	22.03	0.77
1951	1532835	1422440	37.37	42.07	-4.70
1961	1743202	1538276	13.72	8.14	5.58
1971	2423388	2120373	39.02	37.84	1.18
1981	3840700	3369808	58.48	58.93	-0.44
1991	5336815	4703303	38.95	39.57	-0.62

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
TAMILNADU					
1901	1330604	1394177	—	—	—
1911	1549722	1599415	16.47	14.72	1.75
1921	1707176	1720903	10.16	7.60	2.56
1931	2117995	2112387	24.06	22.75	1.32
1941	2598742	2574940	22.70	21.90	0.80
1951	3692907	3640618	42.10	41.39	0.72
1961	4579392	4411136	24.01	21.16	2.84
1971	6389294	6075540	39.52	37.73	1.79
1981	8153393	7798482	27.61	28.36	-0.75
1991	9751859	9275174	19.60	18.94	0.67
UTTAR PRADESH					
1901	2802390	2569411	—	—	—
1911	2647419	2259254	-5.53	-12.07	6.54
1921	2704151	2232265	2.14	-1.19	3.34
1931	3081844	2486945	13.97	11.41	2.56
1941	3887754	3128736	26.15	25.81	0.34
1951	4738717	3886982	21.89	24.23	-2.35
1961	5232856	4247039	10.43	9.26	1.16
1971	6802409	5586187	29.99	31.53	-1.54
1981	10778141	9120974	58.45	63.28	-4.83
1991	14854130	12799280	37.82	40.33	-2.51

YEAR	TOTAL MALE	POPULATION FEMALE	GROWTH RATE MALE	RATE FEMALE	G.R. DIFF (M - F)
1	2	3	4	5	6
WEST BENGAL					
1901	1236175	803544	—	—	—
1911	1455635	893973	17.75	11.25	6.50
1921	1582981	934893	8.75	4.58	4.17
1931	1835303	1060564	15.94	13.44	2.50
1941	3041242	1698980	65.71	60.20	5.51
1951	3783102	2498540	24.39	47.06	-22.67
1961	5020100	3520742	32.70	40.91	-8.21
1971	6262435	4704598	24.75	33.63	-8.88
1981	7943412	6503309	26.84	38.23	-11.39
1991	10034551	8587463	26.33	32.05	-5.72

APPENDIX_3

DECADAL GROWTH RATE OF CLASS-I CITIES BY SEX, INDIA
AND MAJOR STATES, 1901-1991.

YEAR	TOTAL POPULATION		GROWTH RATE		G.R. DIFF. (M - F)
	MALE	FEMALE	MALE	FEMALE	
1	2	3	4	5	6
INDIA					
1901	3788093	2968794	—	—	—
1911	4146144	3010191	9.45	1.39	8.06
1921	4920350	3446105	18.67	14.48	4.19
1931	6100002	4364054	23.97	26.64	-2.66
1941	9829700	7031641	61.14	61.13	0.02
1951	15550904	12206339	58.20	73.59	-15.39
1961	22394763	17888127	44.01	46.55	-2.54
1971	33816333	27996925	51.00	56.51	-5.51
1981	51244101	44089007	51.54	57.48	-5.94
1991	74248492	65481558	44.89	48.52	-3.63
ANDHRA PRADESH					
1901	232295	216171	—	—	—
1911	259199	242910	11.58	12.37	-0.79
1921	209513	196117	-19.17	-19.26	0.09
1931	247623	219271	18.19	11.81	6.38
1941	384780	354379	55.39	61.62	-6.23
1951	889214	874375	131.10	146.73	-15.64
1961	1395121	1312822	56.89	50.14	6.75
1971	2097553	1965888	50.35	49.75	0.60
1981	3460217	3252971	64.96	65.47	-0.51
1991	6111276	5801592	76.62	78.35	-1.73

1	2	3	4	5	6
BIHAR					
1901	68699	69801	—	—	—
1911	72590	67058	5.66	-3.93	9.59
1921	65777	54199	-9.39	-19.18	9.79
1931	92238	67452	40.23	24.45	15.78
1941	267023	200010	189.49	196.52	-7.03
1951	469731	386989	75.91	93.48	-17.57
1961	871885	668643	85.61	72.78	12.83
1971	1439402	1117746	65.09	67.17	-2.08
1981	2592551	2115216	80.11	89.24	-9.13
1991	3263264	2719120	25.87	28.55	-2.68
GUJRAT					
1901	219567	199612	—	—	—
1911	181779	160218	-17.21	-19.74	2.53
1921	221820	179543	22.03	12.06	9.97
1931	290867	246521	31.13	37.30	-6.18
1941	583651	453666	100.66	84.03	16.63
1951	926108	774461	58.67	70.71	-12.04
1961	1276868	1086203	37.87	40.25	-2.38
1971	1978371	1703753	54.94	56.85	-1.91
1981	3265582	2886353	65.06	69.41	-4.35
1991	4961929	4446861	51.95	54.07	-2.12

1	2	3	4	5	6
HARYANA					
1901	—	—	—	—	—
1911	—	—	—	—	—
1921	—	—	—	—	—
1931	—	—	—	—	—
1941	—	—	—	—	—
1951	—	—	—	—	—
1961	61103	44440	—	—	—
1971	253373	211712	314.67	376.39	-61.72
1981	872952	729797	244.53	244.71	-0.81
1991	1271244	1096746	45.62	50.28	-4.66
1	2	3	4	5	6
KARNATAKA					
1901	83117	79974	—	—	—
1911	97749	91736	17.60	14.71	2.90
1921	179788	161258	83.93	75.78	8.14
1931	285137	256188	58.60	58.87	-0.27
1941	440188	398682	54.38	55.62	-1.24
1951	845827	775013	92.15	94.39	-2.24
1961	1148842	1030077	35.82	32.91	2.91
1971	1932185	1722821	68.19	67.25	0.93
1981	3290403	3004035	70.29	74.37	-4.07
1991	4663299	4283758	41.72	42.60	-0.88

1	2	3	4	5	6
KERALA					
1901	—	—	—	—	—
1911	—	—	—	—	—
1921	—	—	—	—	—
1931	57642	52176	—	—	—
1941	205389	194639	256.31	273.04	-16.73
1951	337071	321459	64.11	65.15	-1.04
1961	500216	480411	48.40	49.44	-1.04
1971	870290	852452	73.98	77.44	-3.46
1981	1265098	1270364	45.36	49.02	-3.66
1991	2516148	2576309	98.99	102.80	-3.82
MADHYA PRADESH					
1901	74151	64461	—	—	—
1911	56035	44616	-24.43	-30.79	6.35
1921	185160	142634	230.44	219.69	10.74
1931	222433	171422	20.13	20.18	-0.05
1941	317793	246733	42.87	43.93	-1.06
1951	557932	483652	75.56	96.02	-20.46
1961	995150	812199	78.36	67.93	10.43
1971	1653475	1409019	66.15	73.48	-7.33
1981	2636280	2317422	59.44	64.47	-5.03
1991	4095528	3637725	55.35	56.97	-1.62

1	2	3	4	5	6
MAHARSTHRA					
1901	672652	470999	—	—	—
1911	819287	490555	21.80	4.15	17.65
1921	1071833	656644	30.83	33.86	-3.03
1931	1155322	749331	7.79	14.12	-6.33
1941	1518273	1033647	31.42	37.94	-6.53
1951	2935260	2070666	93.33	100.33	-7.00
1961	4209823	3147389	43.42	52.00	-8.58
1971	6227213	4894572	47.92	55.51	-7.59
1981	9056582	7496454	45.44	53.16	-7.72
1991	12754352	10987789	40.83	46.57	-5.74
ORISSA					
1901	—	—	—	—	—
1911	—	—	—	—	—
1921	—	—	—	—	—
1931	—	—	—	—	—
1941	—	—	—	—	—
1951	58417	44088	—	—	—
1961	93742	66044	60.47	49.80	10.67
1971	409023	321776	336.32	387.21	-50.89
1981	712155	582784	42.57	81.11	-38.54
1991	1031400	848948	44.82	45.67	-0.85

1	2	3	4	5	6
PUNJAB					
1901	93199	69230	—	—	—
1911	88879	63877	-4.64	-7.73	3.10
1921	95106	65112	7.01	1.93	5.07
1931	153985	105855	61.91	62.57	-0.66
1941	373990	263942	142.87	149.34	-6.47
1951	366166	292559	-2.09	10.84	-12.93
1961	540383	441507	47.58	50.91	-3.33
1971	711736	591392	31.71	33.95	-2.24
1981	1167152	988512	63.99	67.15	-3.16
1991	1756870	1505416	50.53	52.29	-1.76
RAJASTHAN					
1901	83854	76313	—	—	—
1911	70846	66252	-15.51	-13.18	-2.33
1921	134067	103341	89.24	55.98	33.26
1931	146574	121705	9.33	17.77	-8.44
1941	314774	267492	114.75	119.79	-5.03
1951	427108	384915	35.69	43.90	-8.21
1961	679284	585348	59.04	52.07	6.97
1971	1024905	877307	50.88	49.88	1.00
1981	1814527	1561468	77.04	77.98	-0.94
1991	2686788	2342766	48.07	50.04	-1.97

1	2	3	4	5	6
TAMIL NADU					
1901	414806	413334	—	—	—
1911	449904	436571	8.46	5.62	2.84
1921	520920	495053	15.78	13.40	2.39
1931	759027	713449	45.71	44.12	1.59
1941	939925	889165	23.83	24.63	-0.80
1951	1575725	1488934	67.64	67.45	0.19
1961	2214306	2057745	40.53	38.20	2.32
1971	3729824	3467716	68.44	68.52	-0.08
1981	5108507	4816645	36.96	38.90	-1.94
1991	6487999	6061813	27.00	25.85	1.15
UTTAR PRADESH					
1901	699465	601878	—	—	—
1911	694225	561543	-0.75	-6.70	5.95
1921	717182	549772	3.31	-2.10	5.40
1931	882173	667763	23.01	21.46	1.54
1941	1511244	1135204	71.31	70.00	1.31
1951	2206072	1732634	45.98	52.63	-6.65
1961	2894398	2308350	31.20	33.23	-2.03
1971	3939869	3203686	36.12	38.79	-2.67
1981	5566529	4660881	41.29	45.48	-4.20
1991	8335514	7147319	49.74	53.35	-3.60

1	2	3	4	5	6
WEST BENGAL					
1901	946280	536897	—	—	—
1911	1134750	610448	19.92	13.70	6.22
1921	1244172	640412	9.64	4.91	4.73
1931	1420228	718335	14.15	12.17	1.98
1941	2422647	1198766	70.58	66.88	3.70
1951	2976846	1822349	22.88	52.02	-29.14
1961	3869911	2555140	30.00	40.21	-10.21
1971	4781456	3401481	23.55	33.12	-9.57
1981	6209753	4419456	29.87	29.93	-0.06
1991	8262437	6952437	33.06	57.31	-24.26

APPENDIX NO.4
GROWTH OF POPULATION BY SEX, CLASS-I CITIES, INDIA
AND MAJOR STATES, 1961-1991.

YEAR	GROWTH OF		INITIAL SEX RATIO	SEX RATIO AT THE END OF PERIOD
	MALE	FEMALE		
INDIA				
1961-71	11421570	10108798	799	885
1971-81	17427768	16092082	828	923
1981-91	23004391	21392551	860	930
ANDHRA PRADESH				
1961-71	702432	653066	941	930
1971-81	1362664	1287083	937	945
1981-91	2651059	2548621	940	961
BIHAR				
1961-71	567517	4491103	766	791
1971-81	1153149	997470	776	865
1981-91	670313	603904	815	900
GUJARAT				
1961-71	701503	617540	851	880
1971-81	1287211	1182600	861	918
1981-91	1696347	1560508	861	920
HARYANA				
1961-71	192270	167272	727	870
1971-81	619579	518085	836	836
1981-91	398292	366949	836	921

YEAR	GROWTH OF		INITIAL SEX RATIO	SEX RATIO AT THE END OF PERIOD
	MALE	FEMALE		
KARNATAKA				
1961-71	783343	692744	897	884
1971-81	1358218	1281214	892	943
1981-91	1372896	1279723	913	932
KERALA				
1961-71	370074	372041	960	1005
1971-81	394808	417912	880	1059
1981-91	1459248	1320594	1004	1044
MADHYA PRADESH				
1961-71	658325	586820	816	907
1971-81	982805	908403	852	924
1981-91	1459248	1320303	879	905
MAHARASTRA				
1961-71	2017390	1747193	748	930
1971-81	2829369	2601882	786	945
1981-91	3697770	3491335	828	961
ORISSA				
1961-71	315281	255732	705	811
1971-81	303132	261008	787	861
1981-91	319245	266164	818	834

YEAR	GROWTH OF		INITIAL SEX RATIO	SEX RATIO AT THE END OF PERIOD
	MALE	FEMALE		
PUNJAB				
1961-71	171353	149885	817	875
1971-81	455416	397120	831	872
1981-91	589718	516904	847	877
RAJASTHAN				
1961-71	345621	291959	862	845
1971-81	789622	684161	856	866
1981-91	872261	781298	861	896
TAMILNADU				
1961-71	1515518	1409971	929	930
1971-81	1378683	1348929	930	978
1981-91	1379492	1245168	943	903
UTTAR PRADESH				
1961-71	1045471	895336	798	856
1971-81	1626660	1457195	813	896
1981-91	2768985	2486438	837	898
WEST BENGAL				
1961-71	911545	846341	660	928
1971-81	1428297	1017975	711	713
1981-91	2052684	2532981	792	1234

APPENDIX No. 5(a)

Urban Sex Ratio and Population of Class-I cities, India-1981.

SL. No.	Urban Agglomeration/ City (100,000+)	Population 1981	Sex Ratio 1981
1	2	3	4
1	Calcutta	9,165,650	783
2	Greater Bombay	8,227,332	773
3	Delhi	5,713,581	808
4	Madras	4,276,635	930
5	Bangalore	2,913,537	893
6	Hyderabad	2,528,198	920
7	Ahmadabad	2,515,195	868
8	Kanpur	1,688,242	810
9	Pune	1,685,300	881
10	Nagpur	1,297,977	910
11	Lucknow	1,006,538	832
12	Jaipur	1,004,669	867
13	Coimbatore	917,155	924
14	Patna	916,102	816
15	Surat	912,568	843
16	Madurai	904,362	954
17	Indore	827,071	887
18	Varanasi	793,542	844
19	Agra	770,352	854
20	Jabalpur	757,726	846
21	Vadodara	744,043	890
22	Cochin	635,686	982
23	Dhanbad	676,736	737
24	Bhopal	672,329	866
25	Jamshedpur	669,984	846
26	Ujhasnagar	648,149	876
27	Allahabad	642,420	814
28	Tiruchirapalli	607,815	952
29	Ludhiana	606,250	809
30	Visakhapatnam	594,259	925
31	Amritsar	589,229	838
32	Gwalior	559,776	859
33	Calicut	546,060	1007
34	Vijayawada	544,958	968
35	Meerut	538,461	842
36	Hubli Dharwad	526,493	912
37	Trivandrum	519,766	1006
38	Salem	515,021	952
39	Solapur	514,461	933
40	Ranchi	500,593	821

1	2	3	4
41	Jodhpur	493,609	875
42	Durg Bhilai Nagar	490,158	873
43	Mysore	476,446	938
44	Rajkot	444,156	928
45	Bareilly	437,801	843
46	Nasik	428,778	838
47	Chandigarh	421,256	776
48	Jalandhar	405,709	851
49	Thane	388,577	806
50	Ajmer	374,350	900
51	Guntur	367,219	966
52	Asansol	365,371	787
53	Kolhapur	351,073	901
54	Moradabad	347,983	858
55	Kota	346,928	859
56	Raipur	338,973	909
57	Warangal	336,018	935
58	Faridabad complex	326,968	741
59	Cuttack	326,468	791
60	Tirunelveli	324,034	1005
61	Rourkela	321,326	792
62	Aligarh	319,981	867
63	Jamnagar	317,037	915
64	Aurangabad	316,244	858
65	Bhavnagar	308,194	925
66	Gorakhpur	306,399	831
67	Durgapur	305,838	822
68	Mangalore	305,513	1007
69	Belgam	300,290	894
70	Saharanpur	294,391	860
71	Dehra Dun	293,628	799
72	Ghaziabad	291,955	792
73	Ujjain	281,878	905
74	Jhansi	231,332	887
75	Bikaner	280,366	886
76	Erode	275,103	922
77	Sangli	268,962	914
78	Rajahmundry	267,749	963
79	Amravati	261,387	915
80	Bokaro Steel City	261,240	748
81	Pondicherry	251,471	979
82	Tuticorin	250,673	954
83	Vellore	246,937	980
84	Gaya	246,778	868
85	Malegaon	245,769	947
86	Nellore	236,225	955
87	Kharagpur	234,931	883
88	Udaipur	229,762	866

1	2	3	4
89	Kakinada	226,642	988
90	Akola	225,402	911
91	Bhagalpur	221,276	842
92	Bhubaneswar	219,419	757
93	Gulbarga	218,621	906
94	Tiruppur	215,743	933
95	Dhule	210,927	900
96	Sagar	207,401	860
97	Kurnool	206,661	928
98	Patiala	205,849	873
99	Shahjahanpur	205,325	864
100	Rampur	203,491	893
101	Firozabad	202,837	847
102	Bellary	201,014	941
103	Davanagere	196,481	903
104	Nanded	190,819	906
105	Muzaffarpur	189,765	805
106	Bilaspur	186,885	919
107	Thanjavur	183,464	943
108	Nizamabad	183,135	944
109	Ahmadnagar	181,239	848
110	Darbhanga	175,879	875
111	Shillong	173,064	902
112	Muzaffarnagar	172,435	873
113	Nagercoil	171,641	999
114	Dindigul	170,196	961
115	Trichur	170,093	1045
116	Alleppey	169,934	1023
117	Eluru	168,148	1006
118	Bardhaman	167,589	885
119	Quilon	167,583	1015
120	Rohtak	166,631	867
121	Berhampur	162,407	924
122	Sambalpur	162,190	880
123	Mathura	160,995	846
124	Farrukhabad- Cum-Fatehgarh	160,927	821
125	Yamuna nagar	160,154	831
126	Cannaore	157,777	1001
127	Ratlam	156,490	906
128	Imphal	155,639	976
129	Siliguri	153,825	793
130	Shimoga	151,562	911
131	Bihar	151,308	893
132	Bijapur	146,808	925
133	Hardwar	146,186	817
134	Kanchipuram	145,329	977
135	Talassan	145,254	804

1	2	3	4
136	Kolar Gold Fields	144,406	973
137	Nadiad	142,279	921
138	Faizabad	141,714	779
139	Kumbakonam	141,142	980
140	Burhanpur	141,142	939
141	Alwar	139,973	853
142	Machilipatnam	138,525	977
143	Panipat	137,953	868
144	Hisar	137,254	803
145	Ichalkaranji	133,704	852
146	Porbandar	133,545	949
147	Bhusawal	132,146	917
148	Karnal	132,067	869
149	Agartala	131,513	977
150	Wadhwan	130,448	940
151	Bhadravati	130,159	916
152	Nabadwip	129,647	975
153	Munger	129,187	863
154	Navasari	129,187	854
155	Mirzapur-Cum-Vindhyachal	128,179	850
156	Habra	127,855	960
157	Ckuddalore	127,569	966
158	Bathinda	127,450	819
159	Murwara	125,096	897
160	Arrah	124,614	855
161	Raichur	124,600	934
162	Bhilwara	122,338	889
163	Jalna	122,246	944
164	Katihar	121,693	801
165	Ganganagar	121,516	802
166	Ambala	121,135	970
167	Junagadh	120,072	938
168	Anantapur	119,536	912
169	Ranigaj	119,322	720
170	Tenali	119,216	982
171	Palghat	117,961	1014
172	Gadag-Betgeri	116,596	940
173	Valparai	115,662	949
174	Chandrapur	115,352	907
175	Bhiwandi	115,256	663
176	Tirupati	115,244	909
177	Vizianagaram	115,209	982
178	Hospet	114,711	963
179	Pollachi	114,710	931
180	Khandwa	114,463	916
181	Balurghat	112,531	898
182	Amroha	112,510	894

1	2	3	4
183	Etawah	112,426	873
184	Bharuch	112,389	920
185	Latur	111,961	889
186	Chapra	111,461	868
187	Purnia	109,649	814
188	Sonipat	109,337	844
189	Parbhani	109,328	907
190	Tumkur	109,231	892
191	Adoni	108,905	958
192	Pathankot	108,777	898
193	Ondal	108,647	725
194	Sambhal	108,379	876
195	Proddatur	107,068	951
196	Bharatpur	105,239	834
197	Patan	105,191	955
198	Jaunpur	104,994	875
199	Ambala	104,502	895
200	Bulandshahr	103,666	869
201	Hapur	103,466	867
202	Cuddapah	103,146	930
203	Sikar	102,946	914
204	Bahraich	102,580	877
205	Bheemavaram	101,940	932
206	Rajapalayam	101,633	963
207	Bermo	101,502	818
208	Bhiwai	101,263	836
209	Puri	101,089	876
210	Gurgaon	101,071	869
211	Batala	100,790	888
212	Rewa	100,519	789
213	Gondiya	100,342	955
214	Mandya	100,264	910
215	Karaikudi	100,187	992
216	Baharpur	100,150	963

APPENDIX No. 5(b)

Urban Sex Ratio and Population of Class-I cities, India, 1991.

L. No.	Name of the City	Population	Urban Sex ratio
1	2	3	4
1	Hyderabad	4280261	924
2	Visakhapatnam	1051918	938
3	Vijayawada	845305	965
4	Guntur	471020	977
5	Warangal	466877	954
6	Rajahmundry	403781	974
7	Kakinadada	327407	1001
8	Nellore	316445	976
9	Kurnool	274795	949
10	Nizamabad	240924	972
11	Cuddapah	215545	952
12	Ramagundam	213962	951
13	Eluru	212918	1008
14	Tirupati	189030	938
15	Vizianagaram	176125	1010
16	Anantapur	174792	942
17	Maghilipatnam	159007	987
18	Jgannan	148646	952
19	Karimnagar	148336	936
20	Tenali	143836	989
21	Chirala	142654	1004
22	Adoni	135718	975
23	Proddatur	133860	961
24	Chittoor	133233	970
25	Ongole	128128	942
26	Delhi	8375188	831
27	Bheemavaram	125495	944
28	Nandyal	120171	950
29	Mahbubnagar	116775	940
30	Guntakul	107560	969
31	Hindupur	104635	941
32	Kothagudem	102061	1003
33	Gudivada	101635	996
34	Patna	1098572	829
35	Jamshedpur	834535	858
36	Dhanbad	817549	763
37	Ranchi	614454	856
38	Bokarosteel city	415686	837
39	Gaya	293971	860
40	Bhagalpur	261855	855

1	2	3	4
41	Muzaffarpur	240450	834
42	Darbhanga	218274	868
43	Bihar Sharif	200976	883
44	Arrah	156871	855
45	Katihar	154101	840
46	Munger	150042	867
47	Phusro	142501	807
48	Chapra	136824	849
49	Purnia	135995	855
50	Patratu	109728	724
51	Ahmadabad	3297655	890
52	Surat	1517076	839
53	Vadodara	1115265	898
54	Rajkot	651007	925
55	Bhavnagar	403521	929
56	Jamnagar	365464	936
57	Navsari	190019	881
58	Nadiad	170018	936
59	Anand	168776	908
60	Junagadh	166755	949
61	Wadhwan	166309	929
62	Porbandar	160043	955
63	Bharuch	138246	944
64	Gandhinagar	121746	897
65	Morvi	120107	933
66	Patna	119995	958
67	Valsad	111759	937
68	Bhuj	110734	960
69	Mahesana	109540	910
70	Gandhidham	104392	906
71	Godhra	100363	924
72	Faridabad Complex	613828	804
73	Yamuna Nagar	219642	872
74	Rohtak	215844	882
75	Panipat	191010	870
76	Hisar	180774	842
77	Karnal	176120	893
78	Sonipat	142992	871
79	Ambala	139615	975
80	Gurgaon	134639	892
81	Bhiwani	121449	871
82	Ambala	119535	930
83	Sirsa	112542	863
84	Bangalore	4086548	903
85	Mysore	652246	943
86	Hubli- Dharwad	647640	926
87	Mangalore	425785	1003
88	Belgaum	401619	921

1	2	3	4
89	Gulbarga	309962	902
90	Davangere	287114	909
91	Bellary	245758	937
92	Bijapur	193038	927
93	Shimoga	192647	923
94	Tumkur	179497	839
95	Raichur	170500	943
96	Kolar Gold Fields	156398	973
97	Bhadravati	149131	944
98	Hospet	134935	952
99	Gadag-Batigeri	133918	949
100	Bidar	130804	886
101	Mandya	119970	926
102	Vdupi	117744	961
103	Hassan	108458	927
104	Chitradurga	103345	913
105	Kochi	1139543	996
106	Thiruvananthapuram	825682	1016
107	Kozhikode	800913	1021
108	Kannur	463951	1057
109	Kollam	362402	1016
110	Thrisur	274898	1045
111	Alappuzha	264887	1045
112	Palakkad	179695	1025
113	Kottayam	166178	1003
114	Malappuram	142203	1017
115	Cherthala	132870	1049
116	Guruvayur	118626	1137
117	Kanhangad	118180	1061
118	Vadakara	102429	1040
119	Indore	1104065	895
120	Bhopal	1063662	894
121	Jabalpur	887188	882
122	Gwalior	720068	845
123	Durgbhilainagar	688670	890
124	Raipur	461851	921
125	Ujjain	367154	929
126	Sagar	256878	869
127	Bilaspur	233570	903
128	Ratlam	195752	922
129	Burhanpur	172809	952
130	Dewas	163699	883
131	Murwara	163390	906
132	Satna	160191	850
133	Morena	147095	809
134	Khandwa	145111	915
135	Rewa	128918	823
136	Rajnandgaon	125394	959

1	2	3	4
137	Korba	124365	885
138	Bhind	109731	837
139	Shivpuri	108271	855
140	Damoh	105032	894
141	Guna	100389	883
142	Greater Bombay	12571720	829
143	Pune	2485014	905
144	Nagpur	1661409	916
145	Nashir	722139	890
146	Solapur	620499	946
147	Aurangabad	592052	874
148	Amravati	433746	915
149	Kolhapur	417286	919
150	Bhiwandi	391670	647
151	Sangli	363728	930
152	Malegaon	342431	961
153	Akola	327946	919
154	Nanded	308853	910
155	Dhule	277957	909
156	Jalgaon	241603	907
157	Khalkaranji	235841	892
158	Chanrapur	225841	895
159	Ahmadnagar	221710	881
160	Latur	197164	895
161	Parbhani	190235	915
162	Jalna	174958	931
163	Bhusawal	159459	916
164	Kamptee	131837	906
165	Vavatmal	121834	923
166	Bid	112351	889
167	Gondiya	109271	948
168	Wardha	102974	920
169	Cuttack	439273	798
170	Bhubaneswar	411542	752
171	Raurkela	398692	823
172	Brahmapur	210585	852
173	Sambalpur	192917	884
174	Puri	124835	882
175	Baleswar	102504	852
176	Ludhiana	1012062	798
177	Amritsar	709456	883 ^a
178	Jalandhar	519530	871
179	Patiala	268521	908
180	Bathinda	159114	864
181	Pathankot	147130	984
182	Hoshiarpur	122528	879
183	Moga	110867	880
184	Abohar	107016	852

1	2	3	4
185	Batala	106062	848
186	Jaipur	1514425	868
187	Jodhpur	648621	867
188	Kota	536444	864
189	Bikaner	415355	862
190	Ajmer	401930	909
191	Udaipur	307682	876
192	Alwar	211162	851
193	Bhilwara	183791	874
194	Ganganagar	161377	842
195	Bharatpur	156844	848
196	Sikar	148235	909
197	Pali	136797	857
198	Beawar	106715	913
199	Tonk	100176	935
200	Madras	5361468	927
201	Coimbatore	1135549	808
202	Madurai	1093702	968
203	Tiruchchirappali	711120	959
204	Salem	573685	955
205	Tirunelveli	365932	1005
206	Erode	357427	939
207	Trippur	305546	924
208	Vellore	304713	980
209	Tutilorin	284193	965
210	Thaniavur city	200216	984
211	Nager-Coil City	189482	1000
212	Dindigul City	182293	965
213	Kanchipuram	169813	985
214	Kumbakonam	150502	989
215	Cuddalore City	143774	973
216	Pollachi	127180	960
217	Neyveli	126494	903
218	Arlot	114884	1006
219	Rajapalaiyam City	114042	971
220	Karpur	110473	964
221	Karaikkudi	110473	958
222	Tiruvannamali City	108291	965
223	Valparai City	106289	990
224	Sivakasi	102139	984
225	Kanpur	2111284	837
226	Lucknow	1642134	867
227	Varanasi	1026467	860
228	Agra	955694	843
229	Allahabad	858213	816
230	Meerut	846954	872
231	Bareilly	607652	882
232	Ghaziabad	519508	824

1	2	3	4
233	Gorakhpur	489850	854
234	Aligarh	479978	864
235	Moradabad	432434	878
236	Saharanpur	373904	883
237	Jhansi	368580	879
238	Dehradun	367411	842
239	Firozabad	270534	861
240	Shahjahanpur	260260	882
241	Muzaffar Nagar	247729	891
242	Rampur	242752	906
243	Mathura	233235	875
244	Farrukhabad-Cum-Fatengarh	207783	869
245	Hardwar	188961	836
246	Faizabad	177505	803
247	Mirzapur-Cum-Vindhyachal	169368	864
248	Noida	167440	785
249	Sambaial	150012	874
250	Hapur	146591	868
251	Amroha	136893	897
252	Maunth Bhanjan	136447	934
253	Jaunpur	136287	883
254	Bahraich	135352	869
255	Rai Bareli	130101	852
256	Bulandshahr	126737	897
257	Modi Nagar	124197	854
258	Etawah	124032	880
259	Sitapur	120595	858
260	Fathepur	117206	879
261	Budaun	116706	879
262	Hathras	113653	861
263	Unnao	107203	880
264	Pilibhit	106329	879
265	Gonda	106078	841
266	Haldwani-Cum-Kathgodam	102744	850
267	Calcutta	10916272	827
268	Asansol	763845	830
269	Durgapur	415986	838
270	Kharagpur	279736	896
271	Barddhaman	244789	913
272	Siliguri	220528	771
273	Ondal	226677	787
274	Habra	196457	958
275	English Bazar	176991	922
276	Raiganj	159675	857
277	Nabadwip	156117	972
278	Raniganj	155644	805
279	Dabgram	146817	89
280	Ranaghat	126611	962

1	2	3	4
281	Baharampur	126303	958
282	Balurghat	126199	965
283	Medinipur	125098	921
284	Krishna Nagar	120918	971
285	Bankura	114927	919
286	Santipur	109911	963
287	Alipurdur	103512	933
288	Basikhat	101652	944
289	Haldia	100109	842
290	Chandigarh	574646	813
291	Pondicherry	401337	969
292	Shillong	222273	896
293	Imphai	200615	949
294	Agartala City	157636	983
295	Aizwal	154343	930
296	Shimla	109860	735



1898