# ESTIMATION OF "MISSING GIRLS" IN MAHARASHTRA AND AN ASSESSMENT OF THE "NAKUSA PROGRAMME" IN SATARA DISTRICT

Dissertation submitted to the Jawaharlal Nehru University
in partial fulfillment of the requirements
for the award of the degree of

**MASTER OF PHILOSOPHY**

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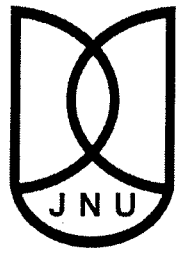


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**NEW DELHI-110067, INDIA**
**2013**

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## DECLARATION

This is to certify that the dissertation entitled **"Estimation of "Missing Girls" in Maharashtra and An Assessment of the "Nakusa Programme" in Satara District"** is based on my original research work under the supervision of Prof. P.M. Kulkarni. I hereby submit this dissertation in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy** of this University. This study has not been submitted in part or full for any other diploma or degree of any other University to the best of my knowledge.

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## CERTIFICATE

It is hereby recommended that this dissertation may be placed before the examiners for evaluation.

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## Acknowledgements

Foremost, I express my earnest gratitude to my advisor Prof. P.M. Kulkarni for his thoroughness, openness to ideas and his criticisms were particularly helpful and instructive. He took interest in my work and encouraged me at all stages in completing this work. I am ever indebted to him for his kindness.

I wish to thank the staff of library; data and computer unit, documentation unit academic section and hostel for the help extended me whenever i need help. I also thank from core from my heart my friends for their help. I gratefully acknowledge support from Ashwani, Renu, Dhiren and Shweta. They have always been supportive of my efforts to take up this research work and encouraged me to complete this work.

Last but not least, I am grateful to my family for their constant support even though they are far away.

There are number of other people who have helped me in many ways in completing this work. I wish to place on record my deep sense of appreciation to all of them.

Finally, I thank Almighty God for the blessings.

July, 2013

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# LIST OF ABBREVIATIONS

1. PSR : Population Sex Ratio
2. CSR : Child Sex Ratio
3. SRB : Sex Ratio at Birth
4. SRS : sample Registration System
5. ANM : Auxiliary Nurse Midwife
6. MPW : Multi Purpose Workers
7. SSA : Sex Selective Abortions
8. ASHA : Accredited Social Health Services

# Chapter 1

# Introduction

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# Introduction

*"Having a daughter is like watering a flower in the neighbor's garden"*

*(Tamil proverb)*

## 1.1.Background

> "The constitution of India provides for equal rights and privileges for men and women to help them improve their status in society. A number of social enactments have been put on the statute book for removing various constraints which hindered their progress. In spite of these measures, women have lagged behind men in different spheres." ( GOI, 1985:321)

India has a long history of strong patriarchal influence. This has translated into compulsive preference for sons and discrimination against the girl child and women. It has engendered practices like female infanticide and *sati*; and led to neglect of the girl child in terms of nutrition, health care access, education and eventually overall development of personality. Thus the abolition of girls has been a part of Indian social tradition, leading to a sex ratio increasingly adverse to women. Many efforts form social reformers have been done but they have been more successful only in some parts of the country than others, as can be seen from the sharp variations and distortions in the child sex ratio across regions, with the north and west of India showing larger deficits in girl population (MOHFW, 2007).

In many parts of world, women have to fight to be treated as human beings and against their exploitation, but India has code of conduct named "Manu Smriti" . This states "Na Stri-Swatantryamahati" means women have no right to be independent. In addition to this , the biggest rule of female exploitation is, "Yonisuchita", meaning 'character'. Pride, reputation of the family and female are always connected with her character and of course not applicable for males. Character of women is like glass. For facing the patriarchal family system, marriage

restriction, 'yonisuchita' etc, rules and regulations imposed from one generation to next (Deshpande, 2012).

India, as a patriarchal culture, is known for the son preference and various discriminatory practices against women. While the overall survival of women and children in India improved considerably in recent years owing improvement in primary health care, the easy availability and accessibility to new medical technologies (amniocentesis and ultrasound sonography) have brought the new discriminatory practices against the women. The earlier regime of neglect and female infanticide has been replaced by the new regime of prenatal sex selection (Guilmoto, 2007) . It is widely accepted that the easy accessibility to sex selection techniques and its misuse have brought down the sex ratio children in the country( Arnold et al., 2002; Kulkarni, 2007; Visaria, 2007).

The son preference is influenced by many socio-economic and cultural factors, such as the son can carry forward name of the family and family business. Sons are wanted because they are responsible for a source of old age support and to perform religious rites at the time of cremation. The Daughters being viewed as *'Paraya Dhan'* (to be married and sent away) because of the practice of dowry sons are preferred over daughters.

"Education, urbanization and economic development have largely improved opportunities for Asian women and girls over the last two decades. Yet, this well-documented progress in women's status and achievements towards gender equality has coincided with a less glorious decline in the proportion of girls among children in many countries. This process, caused to a large extent by the emergence of prenatal sex selection, has gradually intensified and expanded over the past twenty years. It is also leading to an alarming demographic masculinization bound to influence in many ways the future of affected populations for more than fifty years." (Guilmoto 2011: p.1)

In spite of substantial recent economic growth of India, gender imbalance still remains major concern for India. Recent Indian census of 2011 have focalized the attention on the dark side of India's falling and low ratio of girls to boys. For the last 40 years, each successive census has found the number of young girls shrinking relative to boys. Interestingly, the deterioration in the child sex ratio has occurred in the face of rising living standards and improvements in every

other indicator of demographic change and human development, average life expectancy, infant mortality, fertility rate, male and female literacy and enrollment of children in schools. (Nandi and Deolalikar, 2011). These distractions are highly pronounced in the youngest age group 0-6, thus indicating the high scale of injustice and its implied consequences to the long term social and economic processes.

Sen (1990) suggested that there were millions of women are missing in Asia alone. He also noted that CSR in India, China and South Korea is misbalancing while marginal improvement in population sex ratio. He argued the number of missing women in any population can be estimated by calculating the numbers of extra women who would have survived in that society if both the sexes receive similar care. The sex ratio of 0.94 women to men indicates a deficit of women by 6 percent. He suspected that where women and men receive similar care there the ratio is about 1.05 then the real deficit of women in Asia would be 11 percent. These figures reveals disturbed situation of inequality. Moreover Neglect to girls leads to excess mortality for women. This trend has been placed since 1971.

The low child sex ratio in India arises from the practices of sex-selective abortions and excess female infant mortality, both of which are the result of a strong cultural preference for sons over daughters. Some estimates have put the number of `missing females' (i.e., unborn girls) in India as high as 37 million.(Sen, 2003). Son preference has thus been linked to millions of 'missing women' (Sen, 1990).

Coale (1991) also drew attention to unusually high sex ratios at birth and high female mortality rates relative to males, especially in the early childhood of life and for daughters with elder sisters. To give a rough approximation of the numerical impact of excessive female mortality, he estimated the sex ratio in selected populations that would exist in the absence of discriminatory treatment of females, and thus the total number of 'missing' females. For the populations of Asia and Egypt, he calculated the total number of missing females to be about 60 million, a figure lower than Sen's 100 million missing women. Nevertheless, Coale concluded that they confirm the enormity of the social problem brought to wider public attention by Sen.

"The sex ratio for the entire world population is 101 males to 100 females. Analysis of available national census data indicates that in recent decades, sex-ratio imbalances have grown in favor of boy children in a number of South Asian, East Asian and Central Asian countries. Prenatal sex selection leads today to distorted levels of sex ratio at birth (SRB), reaching between 110 and 120 male births per 100 female births in several countries pointing to the intensity of gender discrimination and son preference. The trend has shifted geographically over time, beginning in a number of Asian countries (China, India, and the Republic of Korea) in the 1980s, followed by some countries of the Caucasus (Azerbaijan, Armenia and Georgia) in the 1990s, and has more recently been followed by Montenegro, Albania, and Vietnam." (UNFPA, 2012, P : 2).

India has always been in countries that has significantly more males than females. The severity is particularly at early ages; the child sex ratio has declined steadily from 964 in 1971 to 962 in 1981, 953 in 1991, 927 in 2001, and 914 in 2001. Although a distorted child sex ratio is observed in other Asian countries, including China, Taiwan, Singapore and Vietnam, India has one of the lowest child sex ratios in the world (Nandi and Deolikar, 2011). The situation has been well summarized by Guilmoto (2007).

India's occurrence is critical to understand the current decrease in the proportion of females versus males in populations across Asia. Even if sex-ratio values in India are still below those of China, its potential contribution to the overall "masculization" of is alarming in view of India's demographic weight. The further worsening of India's sex composition requires close monitoring of current sex-ratio trends in the country. The Indian scenario of female discrimination is serious and complex in view of India's social and economic diversity: the interplay of cultural and economic factors, along with the impact of policy initiatives, has produced a assorted situation; in turn, this complexity offers the policy debate on the struggle against gender discrimination (Guilmoto 2007).

In fact sex selection is taking place among Asians even in western countries like USA and UK and has forced the US to introduce a new legislation called the Prenatal Nondiscrimination Act (PRENDA) in 2011 that bans sex selective abortions. Recent Evidence on India- Born mothers in England and Wales shows that prior to 1980s, the sex ratio at birth was close to normal, but for more recent, it has declined, it has emerged of a decline in sex ratio at birth since the 1990s. Sex-

selective abortions have become sufficiently prevalent among India-born mothers in England and Wales to adjust the secondary sex ratio, especially among higher-order births. Media reports claim that the practice has been prevalent for some time, with mothers traveling to India if their request is rejected in Britain (McDougall,2006). This is a reality; despite the fact that the practice is also illegal in India, although the law has not been imposed until recently and implementation is poor. (Dubuc and Coleman, 2007).

**Economic Prosperity and social backwardness**

In states like Punjab, Haryana, Himachal Pradesh and now Maharashtra, which are economically prosperous, the attitude towards the girl child is alarmingly progressive. There will be at least three preconditions for the spread of female foeticide: 1. Easy access to medical facilities, in particular, ultrasound and abortion facilities. 2. Ability to get the doctor and abortionist for the test and abortion and 3. A good network of roads to cut down the cost of travel and the time taken to travel (Bose, 2007).

The key factor seen in Maharashtra and Punjab and Haryana, is that there is large superior class. This is the region where cultivation of cash crops is undertaken on mass basis, where the larger amount of land is covered under water and irrigation where Child Sex Ratio is less ( Deshpande, 2012).

## 1.2 The Concept of Missing girls

The concept of 'missing women' was highlighted by the distinguished Economist and Nobel laureate 'Amartya Sen' to spotlight scholarly and public attention on this serious social problem. He estimated at that time that there were 100 million missing women world-wide of whom 37 million were missing in India only. The term 'number of missing females (or woman or girls)' has been commonly used from there onwards. This is the number of females, relative to the number of men, which should have been in population but were not. Here in this study, 'Total missing girls' refers to females between ages 0-6 at a specified date of census date (2011). Girls who were missing because of sex selective abortions and excess female child mortality. If migration as a factor is eliminated females can be 'missing' an account of higher than expected mortality and than normal sex ratio at birth. Sex selective reporting errors can alter the observed

sex ratio in a population, that is, some may not be 'truly missing' but only 'reportedly missing'(Kulkarni, 2007).

United Nations , estimates the current number of missing women by comparing age and sex distributions in characterized by prenatal sex selection or neglect of girls, and in the rest of the world. The estimation procedure leads to a total gender gap of 117 million women missing in 2010, most of them from China and India. This number reflects the recent rise in the number of unborn girls due to prenatal sex selection, but also the cumulated toll of excess female mortality over several decades. It is also estimated that 39 million girls are missing in 2010, corresponding to the young women and girls born since 1990 when sex determination became common across the world. The gender gap between men and women has risen since 1950, and especially since 1990 under the influence of rising prenatal sex selection while the overall impact of sex differentials in mortality is declining.

Table 1.1 : Estimates of Sex Selective Abortions Due to Prenatal Sex Selection, 2001-07, India and Selected States (Computed from SRS data).

| State | Estimated number of female births that did not occur each year due to prenatal sex selection | % of missing female births (out of the total female births) |
|---|---|---|
| Punjab | 35833 | 16.2 |
| Haryana | 33588 | 12.9 |
| Jammu & Kashmir | 9987 | 10.5 |
| Delhi | 11883 | 8.9 |
| Rajasthan | 71931 | 8.7 |
| Gujarat | 47503 | 7.9 |
| Uttar Pradesh | 195899 | 7.6 |
| Himachal Pradesh | 4468 | 7.6 |
| Bihar | 76160 | 6.0 |
| Maharashtra | 55053 | 5.9 |
| Jharkhand | 12718 | 3.4 |
| Madhya Pradesh | 17261 | 1.9 |
| Kerala | 3697 | 1.5 |
| Andhra Pradesh | 8621 | 1.1 |
| Assam | 3832 | 1.1 |
| Karnataka | 1942 | 0.3 |
| India | 601468 | 4.8 |

(Assumption: Normal sex ratio at birth = 952) Source: UNFPA 2007

As shown in table 1.1, India had 6, 01, 468 number of female births that did not occur each year due to prenatal sex selection during 2001- 2007. It is about 5 % of female births. Punjab (16.2) has the highest intensity of practice followed by Haryana (12.9) and Jammu and Kashmir (10.5). After that Delhi, Rajasthan, Gujarat , Utter Pradesh and Himachal Pradesh also had higher share accounted around 8 % to 9 % of female births in each state. Bihar and Maharashtra states had 6% of such abortions to female births. These are huge proportions from North and North West India. States from southern India and North – Eastern region have very low proportion of missing girls to female births.

### 1.3 Imbalance in Child Sex Ratio

Female disadvantage in mortality has reduced drastically; this has been counterbalanced by natal disadvantage through prenatal sex detection and selective abortion. In India, the low child sex ratio has resulted from both excess female infant mortality due to malnutrition and neglect, and sex-selective abortions, the roots of which lie in strong cultural preferences for sons (Jha *et al.* , 2006; Arnold, Kishor, and Roy, 2002; Jha *et al.* , 2011). Similar observations have been documented in East Asian countries (Ebenstein, 2007; Lin and Luoh, 2008; Chunn and Das Gupta, 2009), while male-biased sex ratios have been found among children of Asian immigrants in the US, Canada and, Norway (Almond and Edlund, 2008; Almond, Edlund, and Milligan, 2009; Singh *et al.* , 2010).

Along with rise in population size, there is evidence of more males than females in sex ratio in general as well as in child sex ratio. Even though the low of sex ratio is a reality from the very beginning and more so in case of child population in India (Seth, 1996), the concern regarding this phenomenon with the onset of this century is because of the astonishing figures exposed by the recent censuses.

The impact of the falling ratio is important as it not only contributes to the deteriorating status of women in society, but also adds to increasing crime and violence (Edlund *et al.*, 2007; Hudson and Boer, 2002)

Higher sex ratios registered in China, South Korea, and India since the 1980s are mainly accounted by the higher births in families where only girls have been born (Das Gupta and Mari Bhat, 1997; Gu and Roy, 1995; Jha *et al.,* 2006).

A study, conducted by the Christian Medical Association of India (CMAI) in 2002-03, shows that more educated parents too have a bias against having a girl child. In fact, the best Sex Ratio at Birth (SRB) of 933 was in cases where both parents had studied up to middle school or less. In contrast, where both parents had studied up to high school, the SRB was mere 690. Graduate parents had a low SRB of 813. While it was even lower at 769, where both parents were post graduates. The study does suggest, however, that an employed mother has a positive impact on SRB. While SRB of housewives was 783, it was higher at 839 for mothers in high end professional jobs and 809 for those employed in other jobs. The results of Special Fertility and Mortality survey of 1.1 million households commissioned by the Census office in 1988 reveals that the SRB for the first child is 871 girls born for every 1000 boys. But SRB falls to 759 for the second child if the first child is a girl. If the first two children are girls this ratio dips even lower to 718 for the third child. The report further concludes that "regardless of the education of the mother or religious affiliation of the household, the households are less likely to have a second girl (MOHFW, 2007).

### 1.4 Sex Selective Abortions

Recent advances in the biomedical sciences are raising increasingly complex questions concerning the origin, maintenance, and disposition of human life with increasing frequency. There is uncertainty over whether and in what circumstances one may utilize these advances in knowledge, as well as concern for the values associated with the preservation and maintenance of human life. Such uncertainty and concern constitute the principal focal points of indecision and hence of anxiety and conflict in discussion dealing medical ethical problems involving life processes.

**Forms of Abortions**

Abortion refers to two phenomena, Spontaneous Abortion ( Miscarriage) and Induced Abortion. Spontaneous Abortion (Miscarriage) is the natural end of pregnancy at a stage where the embryo of foetus is incapable of surviving, generally defined in humans at gestation of prior to 20 weeks. (Petroza, 2006). It can happen in first trimester or second trimester.

"On August 25, 1964, the Central Family Planning Board recommended that the Ministry of Health create a committee to study the question of legislation on abortion. The recommendation was adopted late in 1964, and a committee was constituted, with representatives from a variety of Indian public and private agencies. The committee – called Shantilal Shah Committee – issued its report on December 30, 1966. The government decided to liberalize the abortion laws and passed the Medical Termination of Pregnancy Act (MTP Act, 1971). The terminology was specifically designed to make it easy to get the law approved by the parliament. The law was passed as a health measure to protect women from the hazards of non therapeutic abortions" (Karkal, 1991 : p 2)

Under the *Act* abortion is legal if the pregnancy that it terminates endangers the life of the woman, causes grave injury to her physical or mental health or is likely to result in the birth of a baby with physical or mental abnormalities or is a result of rape or contraceptive failure. The *Act* further stated that abortions could only take place in Government approved health facilities specifically approved for conducting abortions and by a registered medical practitioner. Abortion must be performed within the first weeks of pregnancy and no spousal consent is required (Government of India, 1971).

"Health in India is a State subject and therefore the State must make any decisions regarding implementation of health legislation. Of the 22 States and 9 Union territories, the MTP Act of 1971 came into force in April of 1972 in all but three States and the Union Territory of Lakshadweep. In Jammu-Kashmir and in Mizoram, the law was enforced beginning April 1, 1980. The State of Sikkim and Lakshadweep even today continue with old restrictive law. The Law was patterned after the British Abortion Act of 1967, with the important additions that the pregnancy alleged by a woman to be the result of a rape, and, in the case of a married woman, a pregnancy resulting from contraceptive failure, may be presumed to constitute a grave injury to

the mental health of the woman. Thus the Indian MTP Act of 1971 provided legalization of abortion for broad health reasons, for eugenic reasons, under juridical conditions such as rape or incest, and for social reasons such as rape or incest, and for social reasons such as mental or social injury to the mother." (Karkal, 1991 : p.227) The law was passed as a health measure that was expected to provide therapeutic abortions to the large numbers (estimated by the Shantilal Shah Committee to be about 3.9 million per year) of women who were taking recourse to illegal abortions. The current Indian abortion law is recognized as one of the most liberal ones (Karkal, 1991).

The technologies to detect genetic abnormalities in a foetus became widely available in 1970s. But often the technology was used for detection of the sex and the practice of sex-selective abortions became widespread. As the costs of sex-selection diagnostic tests fell during the 1980s and 1990s, the practice became even more rampant. The Indian government responded to this problem by passing the Pre-Conception and Pre-Natal Diagnostics Techniques (PNDT) (Prohibition of Sex Selection) Act in 1994. The PNDT Act prohibited the use of diagnostic methods to detect the sex of an unborn child which has been amended in 2003 as PCPNDT Act (Pre Conception Pre Natal Diagnostics Techniques).

**PCPNDT Act- The legal aspect**

The PCPNDT is an act for the prohibition of sex selection, before or after conception. It regulates, though does not deny, use of prenatal diagnostic techniques, such as ultrasound, for the purpose of detecting genetic abnormalities or other sex linked disorders in the foetus. The purpose is to prevent misuse of such techniques for sex determination that could eventually lead to elimination of female foetus and thereby create a gender imbalanced society.

Even before the enactment of the PNDT Act, the Maharashtra Government in India had enacted the Maharashtra regulation of PNDT act in 1988 under the pressure from 'Forum against Sex Determination and Sex Pre- Selection' (FASDSP) a social action group based in Mumbai. This *Act* was repealed by the enactment of the central legislation based on the very Act known as the 'Prenatal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994' by the Government of India in 1994. The purpose of the *Act* was to prevent sex selective abortions of female foetuses (The Parliament of India, 1994).

Eventually, this act was also amended with effect from 14th February 2003. It was re-christened as The Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (The Parliament of India, 2003). The change in nomenclature denotes a shift in emphasis from "regulation" of techniques to "prohibition" of sex selection. It also represents a widening of the scope of law to include pre-conception sex selection techniques. The salient features of the act are:

"

i. Sex Determination of Unborn child is not permissible.
ii. Utilization of Ultrasound, amniocentesis to determine and communicate the sex of the unborn is punishable under the law since January 1996.
iii. Any person conducting ultra-sonography on pregnant woman shall give a declaration on each report on ultra-sonography that he/she has neither detected nor disclosed the sex of the foetus of the pregnant woman to anybody.
iv. No person , including specialist or a team of specialists in the field of infertility, shall conduct or aid in conducting sex selection on any tissue, embryo, conceptus, fluid or gametes derived from either or both of them.
v. All clinics conducting ultrasound scans must be registered and must display prominently a notice in English or in any local language that sex determination of foetus is prohibited under law.
vi. Use of Pre-natal diagnostic techniques is allowed only on medical grounds for detecting abnormalities, disorders and congenital anomaly etc. and not for determining sex of the foetus.
vii. No persons conducting pre-natal diagnostic procedure under the law shall communicate to pregnant woman concerned or her relatives the sex of the foetus by word, signs, or any other method.
viii. Pre-natal diagnostic techniques can be conducted only in genetic clinics, genetic laboratories and genetic counseling centre, which have been registered under PNDT act.

ix. Clinics involved in sex determination tests or advertisements by a doctor or a clinic for conducting the sex determination test of an unborn baby are equally liable for punishment under the PNDT act" (Parliament of India; p.6 ).

Under this law availability of facilities for sex determination was banned and a doctor in an unregistered clinic conducting such a test was liable to be imprisoned for three years with a fine of Rs. 10000/-. Under the act, the person who seeks help for sex selection can face, at first conviction, imprisonment for a 3 year period and be required to pay a fine of Rs. 50,000. The state Medical Council can suspend the registration of the medical practitioner involved and, at the stage of conviction, can remove his/her name from the register of the council.

The act has created the various levels of management like a central level supervisory board, a state level supervisory board, an appropriate authority and a supporting advisory committee. The function of the supervisory board is to oversee, monitor, and make amendments to the provisions of the act. The appropriate authority provides registration and conducts the administrative work involved in inspection, investigation, and the penalization of defaulters. The advisory committee provides expert and technical support to the appropriate authority.

The opinion about the media and across the major cross section of society is that the sonologist is to be blamed while forgetting that termination of pregnancy or actual female feticide is being done elsewhere. The Govt. of Maharashtra tried embedded device to catch the defaulters. But eventually the Government found that device is useless.

However the law has not been implemented forcefully and the act has virtually remained ineffective and inadequate. India has begun to address the problem of sex selective abortions with legislation as well as by participating in the Fourth World Conference on Women in Beijing (1995). According to Kishwar (1993), laws are not likely to be effective in society where son preference is strong and deeply embedded in patriarchal structures and hence, unless the patriarchal norms of the society are challenged the desire to do away with girl children will remain.

**The Practice of Sex selective abortions**

Sex selective abortion is indeed a matter of great concern. The social and demographic implications of sex selective abortions are grave. Sex selective abortion occurs in two steps. The first step is to assess the sex of the foetus. The second step is to obtain an abortion if the foetus is not of desired sex.

Some may argue, parents can decide the sex of their child. But they can't as sex selection will support and increase the discrimination against girl child. Human rights include right to live, and we cannot snatch somebody's right to live because of our interests.

Three methods are commonly used for determining the sex of the foetus. They are amniocentesis (normally performed after 15-17 weeks of pregnancy) ,chorionic villus sampling (expensive and normally performed around 10th week of pregnancy) and ultrasound, the least expensive and normally performed around the 12th week of pregnancy. Ultrasound is a primary investigative modality for foetal diagnosis and therapy.

The technology, introduced to detect genetic abnormalities, in the 1970s became commonly available in India in the 1990s (Arnold *et al.*, 2002). These techniques also came to be widely used to determine the sex of the foetus and subsequent abortions if the foetus was female (Henshaw *et.al.*, 1999). Not only did it spread in urban areas, its use has spread in rural areas too. For example, in one large community based study in rural Maharashtra in India, one out of every six married women who had an abortion in the previous 18 months said the abortion had been subsequent to a sex determination test showing a female foetus (Ganatra, 2002). Since detection of sex is possible through ultrasound, which is affordable service, many people commonly use ultrasound as a good investment in order to save huge dowry amounts, if foetus is female (Fernandes, 1998).

The most widely cited estimates of sex selective abortions are by Jha *et al* (2006). The study covered 1.05 million households in a nationwide sample, a size much larger than the NFHS-2 sample. The survey found a sex ratio at birth of 111.2 males per 100 females (adjusted sex ratio of 899 females per 1000 males). The ratio varied by sex composition of previous children (lower ratio in case of more female children than male) clearly indicating the prevalence of sex selective

abortions. Another study by Jha (2011) has shown that selective abortions from girls especially for pregnancies after a first born girl, has increased substantially in India.

The shift to small family size, evident in India more recently, has not, however, been accompanied by a shift at the same time in the economic and social pressures to have sons and avoid daughters. They desire and want few children while ensuring that at least one if not two of those children are sons. This has also led to increased acceptance and use of sex selection tests to achieve parental preferences to have sons while not exceeding the desired number of children (Visaria, 2007).

Luthra (1994) examines the diffusion of sex determination techniques in India. This technology has spread rapidly because it transmits valuable knowledge and because it fits in nearly with the modernization dynamic within India, which itself has entangled with traditional patriarchal institutions to oppress women. More research needs to be done on ways to stem the adoption of these problematic innovations.

People argue that sex selection for family balancing is ethical; " ..but there is no right to a "balanced family". It is not a natural right nor has it been bestowed on citizens by the political set up. Using diagnostic techniques for sex selection is discriminatory and violates the fundamental right to equality apart from violating the PCPNDT Act. (This has been upheld by Mumbai high court in the context of the case of Mr. and Mrs. Soni Vs Union of India and CEHAT (Center for Enquiry Into Health and Allied Themes, 2005). The judgment states that 'the right to life or personal liberty cannot be expanded to mean that the right to personal liberty includes the personal liberty to determine the sex of the child which may come into existence. Right to bring onto existence a life in future with a choice to determine the sex of that life cannot in itself be a right')" ( Govt of India, 2012, p:16).

**Misusing technology**

Nowadays, even equipments of science and technology are used for making traditional thoughts and beliefs stronger because people are misusing the technology to support their culture. In fact, scientific equipments are used to encourage traditional thoughts of son preference and daughter dis-preference.

Technologies were developed to detect genetic abnormalities, however, in India; they are being misused for the past three decades for detection of sex. The PCPNDT act was not followed by effective implementation. Moreover, the pressures to have small families signaled both by changing social values as well as some population policies- led to even more intensified use of such technologies, cutting across barriers of caste, class, religion and geography. With the advent of new sophisticated preconception sex selection technologies like sperm separation, the girl child's elimination started becoming more subtle, refined and even socially acceptable.

Medical technologies have played a crucial role in reinforcing negative patriarchal systems that demand male heirs. In fact , developments in technology of sex selection techniques have direct relation to the declining juvenile sex ratio in our country. Amniocentesis was first introduced in India in 1975 by the All India Institute of Medical Sciences (AIIMS), New Delhi, for detecting congenital deformities in a foetus. By the mid-1980s it was being largely misused to carry out sex selective abortions-with girl child as the obvious target –in Maharashtra, Punjab and Haryana. The practice soon spread to the rest of the country.

Newer techniques like Pre-implantation genetic diagnostics (PGD), X-Y separation methods , and assisted reproductive technologies like IVF(In-Virto fertilization) , IUI(Intra-Uterine Insemination) and many others are available in the market and largely being used for sex selection.

"There are actually some doctors who claim that they conduct sex determination and 'selection' procedures to help control the population or as a favor to families who already have girl children. Misuse of medical technology for sex selection before birth as well as before conception violates legal and ethical principles.

I. It is against the fundamental right to equality and freedom from gender based discrimination. Guaranteed by the Indian Constitution.
II. It is against principles of Medical ethics.
III. It violates Articles 1, 2, 3 and 5(a) (Annexure X) of the international convention on Elimination of Discrimination against Women (CEDAW) to which India is a signatory.
IV. Coupled with the discrimination against surving daughters, it has resulted in a deficit of several million women from the population. Such an imbalance in the sex ratio would

result in increased violence against women in the form of forced polyandry, rapes, abductions, sale and purchase of brides. There would thus be pronounced insecurity for all women and an increasingly violent society." (MOHFW, 2007: p 16).

### 1.5. Missing girls due to Excess Female Child Mortality

Skewed sex ratios at birth reveal some part of inequality as gender discrimination also exerts itself after birth. The sex distribution of the child population has long been distorted by the presence of higher mortality among girls, especially during early years of their life. These higher mortality risks are the results of girl neglect. They relate to various discriminatory attitudes vis-à-vis girls in post-natal care, parental surveillance, breastfeeding, food, choice to health facilities, immunization, etc. ( Guilmoto, 2011).

Krishnamoorthy (2006) has attributed relatively higher mortality among females than males to low status that females enjoy. He found that in the past females had higher mortality than males at almost all ages, particularly during infant and childhood stages due to poor nutrition and neglect during reproductive age due to high mortality.

"The sex differential in mortality in India, resulting from discriminatory treatment received by girls and women, more than offsets their natural and biological advantage over men. Within India, the social practices and cultural ethos that undervalue women are stronger in some regions than in others. In an almost contiguous belt extending from north –west of India to parts of Rajasthan, Gujarat and Maharashtra. In fact, an increase in the deficit of young girls noted in recent censuses is indicative of a strong possibility that the traditional methods of neglect of female children are increasingly being replaced by not allowing female children to be born." (Visaria, 2007: p. 12). There is a deep internalization of patriarchal values that are linked to their sense of security.

Subsequent studies have provided evidence that it is excessive female mortality before birth, at birth, in infancy and in childhood, which mainly account for the imbalance in sex ratios and the absence of a large number of female children in Asia. In a recent study, Croll (2000) raises the controversial question of why millions of girls do not appear to be surviving to adulthood in contemporary Asia. Thus, there is an urgent need to focus attention

on daughter-discrimination, family planning, girlhood, children differentiated by their gendered value, their birth order and sibling configuration particularly in South Asia.

In an authoritative study of the high masculinity of the population of India, Visaria (1969) showed that the persistence of a ratio of males to females above 1.05 in the censuses of 1931 and later years was not the result of greater omission of females from the censuses, nor of an unusually high sex ratio at birth, but of unusually high female mortality rates relative to male rates. Part of Visaria's evidence for the importance of such mortality differences was a comparison of the ratio of the crude death rates of males and females in the states of India with the ratio of males to females in the populations of each state. The data were from the fourteenth round (1957- 58) of the National Sample Survey. It is evident that, in states where female death rates are especially high relative to male rates, the male population outnumbers the female population by an especially large margin.

Following a similar methodology, Coale (1991) has compared the ratio of males to females in the 1981 census, when it was recorded as 1.071 (Census of India, 1981), with the ratio of the male death rate under five years of age to the female death rate at these ages in the states of India (India, Office of the Registrar General, 1985, 1986, 1987). The death rates used in this comparison were averages for 1982-84 from the Sample Registration System. The linear correlation of the two variables is - 0.9. Clearly the proportion of males in some states (for example, in the Punjab and Haryana) was high because female mortality was high relative to male mortality in these states, while the low masculinity of the population in other states (Kerala) was the result of lower (more nearly normal) female relative to male death rates.

A particularly revealing feature of higher female than male child mortality in the Khanna study area is that the death rate at ages under five for females who have no older sisters is little different from the male death rate, but that the death rate under five of females who have an older sister is about 50 percent higher than the rate for males (Das Gupta, 1987). This relation strongly indicates that higher female mortality is caused by a lower regard for female infants-a lower regard that is less marked when a female child is the first daughter. Supporting evidence is provided by an investigation of medical attendance during all fatal illnesses in the Khanna Study Area in 1957-59. The overall death rate was 19.6 per

thousand for females and 14.8 for males during these years. Singh, Gordon, and Wyon (1962) showed fewer females than males had medical care during the fatal illness, and females generally received care from attendants at a lower level of competence.

Contrary to prenatal selection and infanticide based on conscious decisions, girl neglect is based on mostly passive attitudes of negligence, and rarely equates to active discrimination with the deliberate intention of harming girls. To a large extent, families are unaware of the consequences of their gender bias, and the resulting excess mortality rates among girls are almost the only tangible testimony of the extent of the bias existing against young girls. In the absence of specific discrimination against girls, mortality rates among boys across the world tend to be higher by about 20-25%. As a result, the mere fact that some female mortality rates observed in one area are equal to or higher than equivalent male rates signals the presence of discriminatory behavior among children. A mortality ratio of 120 therefore corresponds to male mortality rates under five that are 20% higher than female rates, and this is what is observed in several continents, North America, South America, Africa, and Europe (Guilmoto, 2011).

### 1.6. The "Nakushi/ Nakusa Programme" in "Satara" District of Maharashtra

Maharashtra was the first state to initiate PCPNDT act in India. But still Maharashtra has been struggling with a declining child sex ratio and is ranked among the five worst states in the country. The reason is the same as elsewhere: strong preference for a male child. But in a shocking indicator of how extreme this desire is and how deep-rooted the bias against the girl child can get, scores of families across Maharashtra have simply named their daughters 'Nakushi' or 'Nakusha'—meaning 'unwanted' in Marathi.

The district administration of Satara identified 282 such girls under the age of 18 and either renamed them or gave them the option of picking a new name for themselves. The 'Nakushi' programme was the part of 'Save the Girl Child Campaign' under the 'National Rural Health Mission' and implemented by the Health Department of the 'Zilha *parishad*', Satara district.

District officials and activists say the practice of villagers naming girls 'Nakushi' was discovered recently and blamed it on a mix of frustration and ignorance. Mothers of Nakushis said it was a popular belief in these parts that if their girl was named Nakushi, their next-born would be a boy.

Parents of such girls were usually poor and could not afford the technology that the rich used to illegally determine the sex of the foetus. There are two issues here. We have to realize that the parents did not abort the child through sex selection and detection. They expressed their frustration by naming her 'Nakushi'. So the district administration hoped to spread awareness about girls and make them feel wanted by this project.

### 1.8 An Overview of some literature

Conceptually, Sex ratio is a byproduct of three factors; sex ratio at birth (SRB), gender differences in mortality, and the amount of age misreporting and under count by sex. Usually, in such situation, a gender differential in mortality contributes to a large extent in changing the sex ratio of a population. This is because SRB of a population under natural condition does not change even over several decades. However, the combination of prevailing sex preference in a society and availability of advance medical techniques of sex determination test pregnancy can create greater likelihood to manipulate the value of the value of SRB through sex-selective abortion. As a result, sex ratio will be in favor of that sex which has preference in society. In case of age misreporting or undercount, it is found that its extent does not differ much by sex, and therefore its ultimate effect on sex ratio is minimal (Premi, 2002).

In the present time, an escalating dowry system, increasing landlessness and poverty, with high gender differentials in wages and decreasing economic opportunities as well as marginalization of women have been suggested as reasons for increasing son preference (Sudha and Rajan , 1999). In much of South Asia, sons are preferred over daughters for a number of economic, social and religious reasons, including financial support, old age security, property inheritance, dowry, family lineage, prestige and power, birth and death rituals and beliefs about religious duties and salvation (Arnold et al., 2002; Basu, 1993; Kishor, 1993; Miller, 1981). Sons are expected because they provide economic support to their parents. In contrast, daughters may represent a substantial economic burden in places where their parents provide dowry. Moreover,

the utility of having sons rises from the religious functions which only a son can perform (Lahiri, 1984). Das Gupta (2005) quite fairly summarizes the literature when she states that the evidence indicates that parental preferences overwhelmingly shape the female deficit in south and East Asia. It is a case of son preference versus daughter dis-preference. There is not just son preference but there is also daughter dis- preference that leads people to take extreme measures like female foeticide (Bhatia, 2007).

A comparison between prenatal and postnatal discrimination suggests a greater demographic impact of prenatal discrimination on the steeper increase in child sex ratio in the recent decades. The impact of son preference on sex ratio at birth and excess child mortality for girls tends to vary with overall level of fertility (Arokiasamy , 2005). Increase in overall Sex Ratio in Census 2011 indicates improved visibility of women in the country. Paradoxically, the Child Sex Ratio (0-6) continues to decline in the successive censuses (Office of Registrar General, 2011). In South Asian societies, it is believed that a major barrier for the decline in fertility was the prevalence of strong son preference, irrespective of socioeconomic development (Shekher, 2005).

Nair (1996) has explained the changing sex ratio of children in India and states with exploration of possible reasons for the variations in the sex ratio. The paper measures the extent of female mortality disadvantage and describes the possible demographic, social, health and other consequences of changing sex ratios of children. The reports of 1971, 1981 and 1991 censuses, 1991 SRS and of the 1992-93 NFHS were used as data sources for the study. He has estimated the number of female children missing (including birth averted) based on three levels of normal sex ratio at birth to the 1991 census and 1992-93 NFHS data. Since age –wise data were not available for 1991 census but the number of (0-6) age group data was available, the number of missing children in the (0-6) age group was estimated for 1991 census. The medium level estimation found a sex ratio of 103. The numbers of missing children were found to be 1971018 and they represented 2.63 per cent of the total (including missing children) female children in the (0-6) age group. The missing girls in (0-4) age group based on NFHS data were about 2.22 per cent.

Miller (1989) examined data from 1961 and 1971 Censuses and noted spatial variations in the juvenile sex ratio (for ages 0-9 years) in rural areas using data at the district level. The 1991 Census revealed a worsening of the population sex ratio and led to much debate on the roles of various factors, especially age and enumeration errors, sex ratio at birth and sex –selective abortions , and detailed analysis of data (Kundu and Sahu,1991; Rajan et al., 1991; Raju and Premi,1992; Nair, 1996; Premi, 2001; Agnihotri , 2000,2003). Premi and Raju (1998) observed that the sex ratio in the population aged 7 years and above declined from 929 in 1981 to 923 in 1991. Similarly, the sex ratio in the population aged 0-6 declined from 962 in 1981 to 945 females per 1000 males in 1991. Low sex ratio reflects that women suffered from neglect in the past and probably continue to so even now but a fall of 17 points in the child sex ratio over a decade is huge decline.

Kundu and Sahu (1991) argued some explanations for the decline in sex ratio at the national level. The undercount of women compared to men in different censuses, larger discrimination of females in providing the minimum nutrition, access to health and other amenities and increase in the proportion of male selective migrants from other countries , reduction in foetal wastage resulting in a decline in female male ratio at birth; and female selective termination of pregnancy leading to a decrease in the SR at birth.

Arnold *et al.* (2002) had calculated estimates of sex selective abortions by taking National Family Health Survey (NFHS)-2 conducted during 1998-99.Their study found that those women who had ultrasound test had a sex ratio of birth of 112.2 (or 891 females per 1000 males) whereas the expected sex ratio at birth is 105.There observed a large variation from natural sex ratio. From this, it was estimated that 106,107 sex selective abortions were performed per year during the period.

The study by Chander Shekhar and Ram (2003) clearly shows a continuous decline in sex ratio in considered age groups, particularly in age group 0-4, at the national and the state level at the last four censuses, beside a few state level exceptions for 1981 Census. Similar trends are observed for other two age groups 0-6 and 0-9. Interestingly, decline in juvenile sex ratio persists over the years. Nevertheless, the improvements in overall survival chances for female have been

noted over the period. It reflects the postnatal discrimination against girls is weakening. Therefore, declining child sex ratios in India indicates an increase in sex selective abortions.

The increase in prenatal sex selection is the joint product of three distinct factors clearly distinguished by Guilmoto (2011). Firstly, Son preference constitutes the primary factor behind sex selection in a patriarchal society in which girls and women have a marginal social, economic position and have fewer rights. Secondly, prenatal diagnosis technology represents then the second essential factor, enabling parents to know the sex of their child in advance. Coupled with abortion, legal or not, sex determination leads many parents to resort to selective abortions. The decrease in the sex ratio at birth in specific countries has indeed often been linked to the spread of the ultrasound technology though the private healthcare system. In addition to these demand and supply factors, low fertility represents the third factor because it worsens the potential need for sex selection–by increasing the probability of having a son when the average family size lowers.

Apart from widely documented non-economic factors, there are several hypotheses that sex selection occurs for economic reasons and are based on parents' inter temporal allocation decisions to optimize the family utility function. Rosenzweig and Schultz (1982) and Strauss and Thomas (1995) showed according to economic models of choice, parents tend to invest in the child with greatest potential returns, and this rationale can be extended to the unequal sex ratio in India. In developing countries, the gender gap in returns is due to both labor market forces and cultural practices where parents have to pay a dowry for their daughter's marriage. These daughters then move out of the family, while sons stay within the household with their wives. Thus, parents are more likely to receive the full return of investing in sons than in daughters under resource constraints.

Assumptions that discrimination against girls would diminish with economic development and female education have proven simplistic (Löfstedt, Shusheng, and Johansson 2004). For example, in South Korea sex ratios kept declining until a few years ago despite rapid development in industrialization, education, and urbanization, including women's participation in the formal labor force. Even though South Korea was included in the OECD countries by the mid-1990s, gender imbalance rose sharply during this period (Chung and Das Gupta 2007). This

pattern is also evident in the Indian context, where the decline has continued despite rising living standards and higher levels of human development. In fact, the gender imbalance is more pronounced in wealthier states like Punjab and Haryana, and in urban areas where people have better access to prenatal tests to determine fetus sex (Haub and Sharma 2006; Subramanian and Selvaraj 2009).

South Korea was the first country to report sex ratio distortions at birth, because the application of sex-selective technology there preceded other Southeast Asian countries. With the wider access to better health care and ultrasound technologies, the sex ratio inequality between girls and boys rose in the country and reached its peak in 1990s. In the mid 1990s, the South Korean government began a public awareness campaign warning of the dangers of gender ratio inequality, as well as stricter enforcement of laws forbidding sex-selection technologies. This campaign was highly successful, with the gender-ratio-at-birth falling steadily. In policy terms, the strict enforcement of the anti-sex-selection laws in South Korea was seen to have influenced the process of combating gender ratio inequality greatly. In 1991 eight Seoul physicians had their licenses suspended for performing the operations and in the next year the sex ratio in the city fell from 117 girls for every 100 girls to 113 boys for every 100 girls, suggesting that indeed strict enforcement of laws has beneficial effects on controlling the actions of the population. The public awareness campaign, which was devised by the government, has focused on the problems that a large gender ratio inequality could lead to, namely the upcoming troubles for young men in finding brides (Das Gupta, 1987).

One major consequence of fertility decline in East Asian countries, such as South Korea and China, has been a steep rise in the sex ratio at birth. This proposes that fertility decline in societies where strong son preference observed , may be accompanied by increased manifestation of sex bias as reflected in excess mortality of girls. Similar trends may be found in India, especially its northern region. Now, Fertility in India has been falling; between 1981 and 1991 the Total Fertility Rate declined from 4.5 to 3.6. (Registrar General of India, 1991)

Das Gupta and Bhat (1997) examined the relationship between fertility declines in India and the evidence of an increase in sex bias. Data were obtained from 1981 and 1991 censuses, Khanna re-study villages in the Punjab (moderate fertility population) and in Kerala (low fertility population) in 1991. The number of sons desired by women who were childless declined by only 7.4 per cent. In the Khanna sample, reduced fertility led to a decline excess mortality of women from 9 per cent to zero when the sex bias was unchanged and fertility level varied. When fertility was kept constant at low level and the sex bias varied, excess mortality of women increased from 0 to 25 per cent. The findings suggest that changes in birth distribution by parity outweigh intensified sex bias at low parities. The sex ratio of children during 1981-91 rose in all states, including the south where the sex ratio has been more balanced.

Das Gupta while explaining excess mortality has pointed out that the ' parity' effect is based on the observation from studies in South Asia that excess mortality of girls was concentrated in higher parities (Das Gupta 1987; Muhuri and Preston 1991; Pebley and Amin 1991). Therefore, as fertility declines and the proportion of births of higher parity decreases, the excess mortality of girls will also fall . The 'intensification' effect is based on the observation from studies in China and South Korea that excess mortality of girls at a given parity has become more pronounced as total fertility has fallen, because parents discriminate more at each parity (Hull, 1990; Zeng Yi *et al.* 1993). The seminal work on India's sex ratio was by Visaria(1968) based on the analysis of the census data up to 1961 showed a deficit of females, especially in the north-western region of India, continuing into Pakistan. Excess female mortality was observed as a major factor.

"India may perhaps gradually converge to patterns of discrimination against girls similar to those found, in China, where sex ratios at birth are rising, but differences between the mortality of the two sexes after birth are small. It is possible that pre-natal sex regulation may replace post-natal regulation as a method of controlling the sex composition of families, because the psychological burden of abortion is lower than that of neglecting a living child. This may result in skewing the sex ratio even further. On the other hand it should result in a higher proportion of girls being born in families that actually want them, or are at least willing to tolerate them, and thus perhaps improve the way they are treated" (Das Gupta, 1987: p. 314) .

## 1.9 Need for the study

The low and falling child sex ratio in the country is a matter of grave policy concern, not only because it violates the human rights of unborn and infant girls but also because it deprives the country of the potential economic and social contribution of these `missing girls.' In addition, there may be longer-run adverse impacts from a marriage market squeeze caused by an excess supply of male relative to female youth. Already, states like Haryana and Punjab, where the sex ratio has been extremely distorted for several decades, have been experiencing bride trafficking (Nandi and Deolalikar, 2013). In Haryana, an employed man is likely to receive several proposals for marriage while without a job; he has to face involuntary bachelorhood or family have to import a bride from a poor Eastern state (Kaur, 2007). So no one can doubt the great importance of the subject that is addressed in this thesis because of future difficult implications on marriage market and society altogether.

Notably India's home (interior) secretary , Mr. G.K. Pillai admitted that ".....whatever measures that have been put in over the last 40 years have not had any impact on child sex ratio and therefore that requires a complete review" ( The Economic Times, 1 April 2011).

There is important need for this study as how many sex selective abortions exactly occurred is not known because illegal abortions are not recorded. Therefore, it is necessary to obtain estimates from other sources and that too indirectly. In order to see spatial variations, it becomes necessary to estimate the incidents at lower levels at least up to the district level. Moreover we are looking at "Unwantedness". Unwantedness and neglect of surviving daughters is another major problem. Discriminatory practice against daughters like "Nakusa" is an ethical issue to be considered so study on unwantedness is needed as there are many policy failures to be considering this important issue.

India is a gender –awry country , especially as society seems to turn against the girl and female foetus. This thesis raises the sensitive issue of millions of girls in Maharashtra who fail to appear in society figuratively.

## 1.10. Organization of Thesis

The thesis will be organized in seven chapters.

I. The first chapter **"Introduction"** contains introduction, review of literature, need for the study.

II. The second chapter **"Conceptual Framework and Methodology"** includes objectives and statistical analysis which has been carried in the study.

III. The third chapter **"Spatial Distribution of Child Sex Ratios"** covers trends, changes in CSR in all districts of Maharashtra.

IV. The Fourth Chapter "**Estimation of Total Missing Girls in all districts of Maharashtra"** provides estimation of Sex Selective Abortions and estimation of Excess Female Child Mortality and finally Total Missing Girls in all districts of Maharashtra.

V. The Fifth Chapter examines relationship between District wise **"Densities of Scan centres and Child Sex Ratios"** to look the effect of scan centres on CSR of districts.

VI. The Sixth chapter " **Nakusa Programme in Satara district"** focuses on proceedings of Nakusa programme and its impact on unwanted girls and community moreover this chapter gives tehsil wise analysis of Child sex ratios.

VII. The Seventh "**Summary and Conclusions**" presents a with summary of the whole work, concluding remarks and relevant policy recommendation that emerged from the study and limitations of the study.

Chapter 2

# Conceptual Framework and Methodology

# Chapter 2

# Conceptual Framework and Methodology

## 2.1 Background of Conceptual Framework

This chapter covers the Conceptual framework, objectives, hypothesis, data sources and methodology used to carry forward the study.

The socioeconomic background of the couple can believably influence couple's access to modern technology, family size desires and intensity of son preference. Moreover Availability of modern technology for sex selection in area and society and public and private campaigns against sex selection are the external societal factors which can affect a couple's decision on utilization of the technology. If there is desire for sex selection so people go for pre natal sex selection. Sex ratio at birth and eventually Child sex ratio gets negatively affected because of sex selective abortions. If there is no desire for sex selection as people think children are god gifted or they could not manage to go for sex selection, there is possibility of postnatal sex discrimination if there is strong son preference in family. It will lead to excess female child mortality in society and if it isn't happen there would be unwanted daughters.

Dyson and Moore proposed that two main differences in kinship structures of "Northern" and "Southern" parts of India mainly establish gender inequality and son preference (Dyson & Moore, 1983). Specifically, in the northern Indian kinship system, marriage is exogamous; it means spouses must be unrelated through kin and often by place of birth or residence. Parents of a girl have to pay all marriage costs and provide a large dowry often.

The review of literature has noted the socioeconomic factors that have an influence on son preference and sex selection. Pandey and Astone (2007) showed that higher education shows significant negative impact on son preference, regardless of desired family size. Moreover, they found desired family size is important predictor which has strong strength and significance on

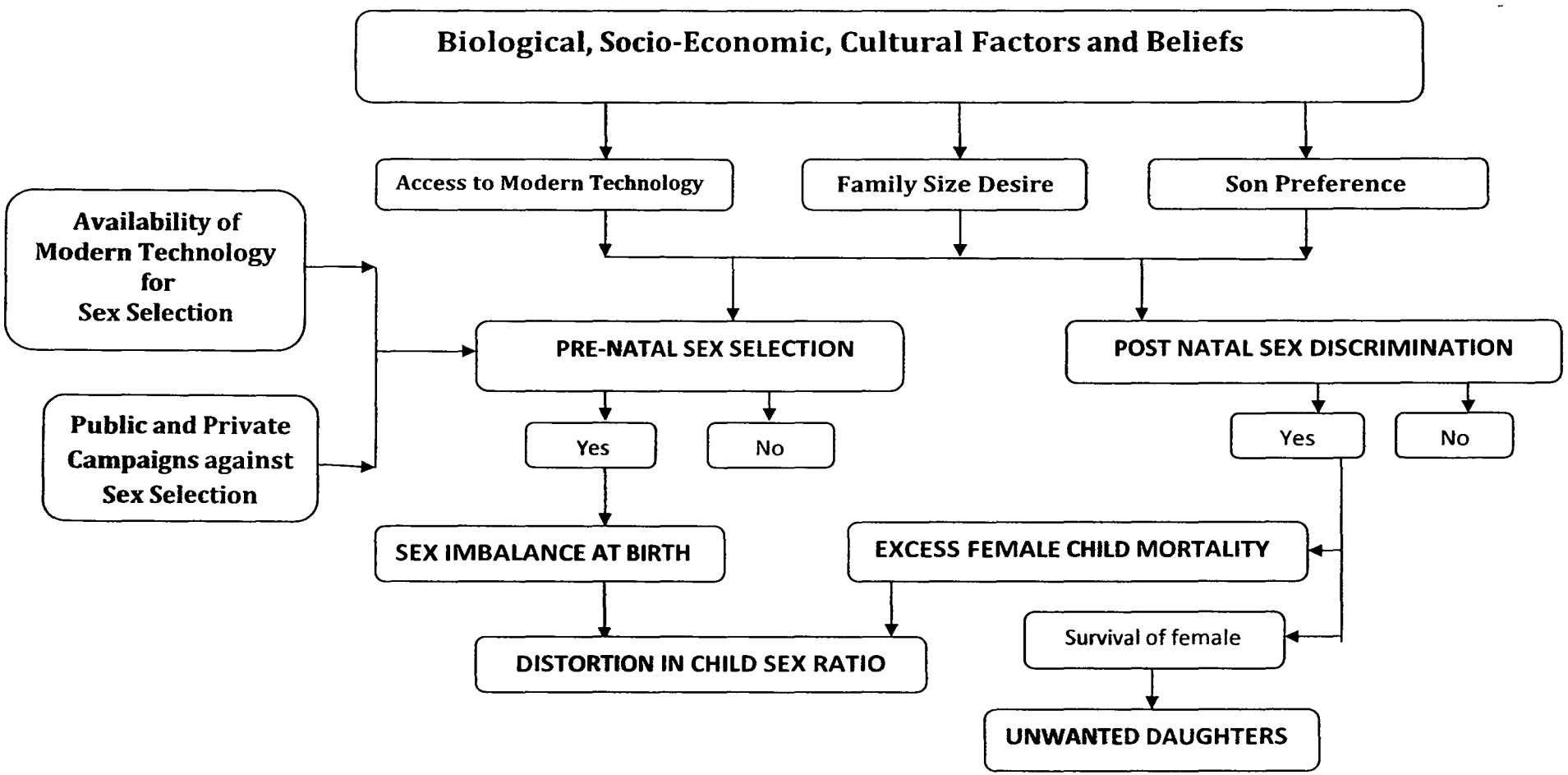
son preference. Caste and religion are associated with son preference among social factors. Srinivas (1976) fount that caste and religion remain strong determinants of son preference, regardless of which state the respondent may reside in, suggesting that these social characteristics continue to influence son preference. Women's participation in economic work may also change their own valuation of their worth and the worth of their daughters more generally (Basu and Basu, 1991; Kishor, 1993). But where son preference is strong, however, maternal education on its own may not be enough to improve daughters' worth. (Bhuiya and Streatfield, 1991; Das Gupta, 1987).

Biological maternal factors of a woman can decide the fertility behavior of woman. Mainly her age, parity and sex composition of living children can decide her fertility preferences. These factors contribute with social environment and moral stands from her family may affect the choice of desired sex of the child. Social networks and education of her parents also can construct the strong feeling to have a son. Social networks can give the exposure to the family that where and how the practice of sex selection is prevalent. Nature of occupation and economic status of the family can drive the access to modern technology and desires for low or high family size. These are internal background factors of family which may affect the intensity of son preference. On the other hand, availability of modern technology for sex selection is the external factor which may promote the utilization of the available modern technology for sex selection. Governments and NGO campaigns against sex selection may act as an external factor which can discourage the desire for sex selection. These factors act as contributors to the prenatal sex selection phenomena. Prenatal sex selection can lead to sex imbalance at birth (Fig.2.1).

Family's socioeconomic background characteristics are factors not only for prenatal sex selection but also predictors of postnatal discrimination. Postnatal discrimination leads to neglect of girls and that finally contributes to excess female child mortality. The excess female child mortality and prenatal sex selection together contribute the distortion in child sex ratio at broader level. Even if girl survives from all this in the family where there is strong preference for sons, she would face unwantedness from her parents, she would treat as unwanted up to the extent to which her parents name her "Nakusa" out of frustration (Fig 2.1).

It must be noted here that the roles of individual factors, such as woman's education, work status, place of residence are not being studied in this dissertation. The analysis here is at the aggregate level, district and not at the individual or household level. However, the field investigation in Satara district brings out how individual decisions are shaped.

Figure 2.1 Conceptual Framework



## 2.2 Objectives

The principal objective for this study is to examine the imbalance in child sex composition in Maharashtra, the trends and spatial variations in it, and explore into factors contributing to the imbalance. The specific objectives are:

1. To study spatial distribution of child sex ratios in districts of Maharashtra.

2. To study the trends and changes in spatial distribution of Child Sex Ratios in districts of Maharashtra.

3. To estimate the number of sex selective abortions during period 1994 to 2011.

4. To estimate district wise numbers of missing girls in Maharashtra at Census 2001 and 2011.

5. To assess contribution of excess female child mortality and sex selective abortions to total missing girls in the 0-6 ages.

6. To assess the relationship between number of sonography centres and Child Sex Ratio in districts of Maharashtra.

7. To assess the influence of development factors on Child Sex Ratio at district level.

8. To explore the factors of Unwantedness of girls through the "Nakusa programmeme" in Satara district and to study programmeme impact on unwanted girls and society.

## 2.3 Hypothesis

The study addresses the following hypothesis:

1. The numbers of sex selective abortions vary considerably across the districts in Maharashtra.
2. The imbalance in child sex ratio is primarily due to sex selective abortions.
3. Density of Scan centres affects child sex ratio across the districts of Maharashtra.
4. Socio-Economic and Cultural factors affect intensity of sex selection.

## 2.4 Study Area and its characteristics

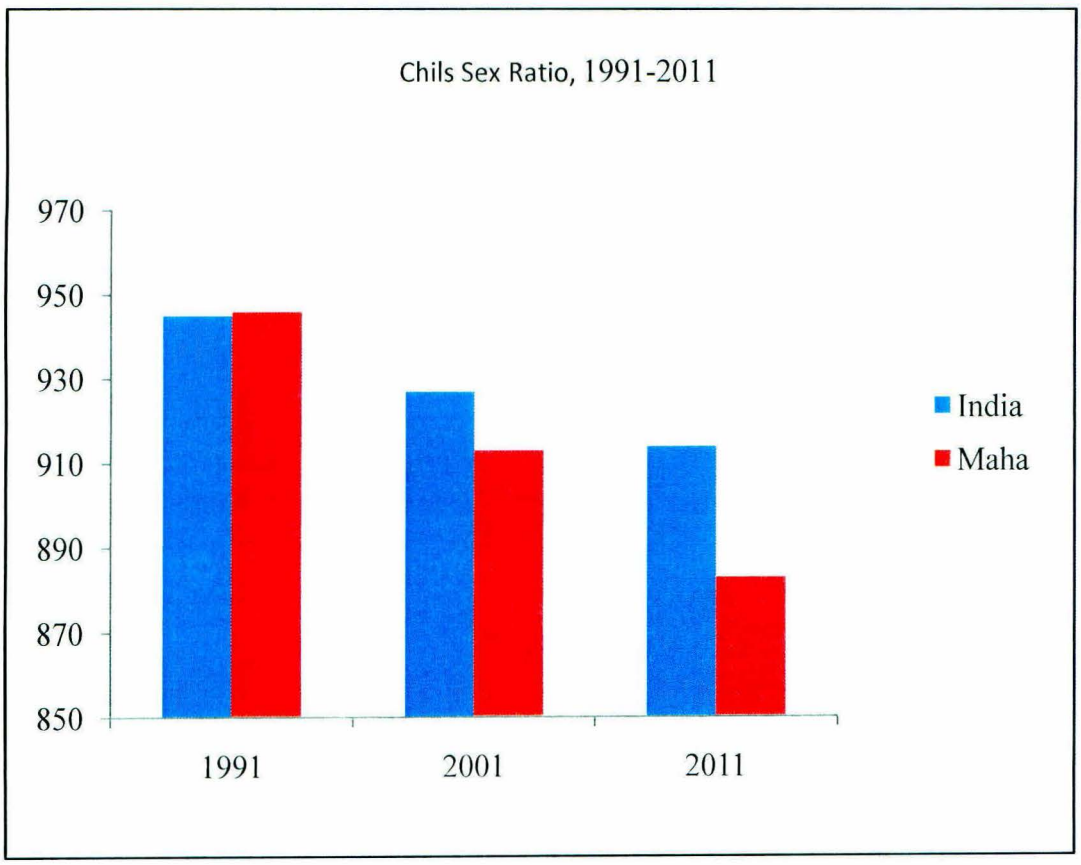
**Maharashtra** is a state in the western region of India. It is the second most populous state after Uttar Pradesh and the third largest state by area in India. Maharashtra is one of the wealthiest states in India.

It is bordered by the states of Madhya Pradesh to the north, Chhattisgarh to the east, Andhra Pradesh to the southeast, Karnataka to the south, and Goa to the southwest. The state of Gujarat lies to the northwest, with the Union territory of Dadra and Nagar Haveli sandwiched in between. The Arabian Sea makes up Maharashtra's west coast.

As per Census 2011, next to UP, Maharashtra with 11, 23, 72,972 population is the second largest State in India in terms of size of population. The growth rate during 2001-11 is 1.5% in the State which is less than the same at national level which is 1.7%. In terms of growth rate Maharashtra stands at 21$^{st}$ rank in India. In terms of sex ratio the State has the 22nd rank with 925 females per 1000 males against 940 at national level. The Child sex ratio is 894 females per 1000 males against 914 at national level. The state with literacy rate of 82.9% against the national average of 74.0% stands at 12th rank in the country. The density of population is 365 persons per sq. Km. as compared to 382 at national level. The proportion of children in age 0 to 6 years is 11.43 percent against 13.12 percent at national level.

The 2001 census revealed that the child sex ratio in the state was low, 913 and further fell to 894 shows another reduction of 19 girls per 1000 boys during the decade 2001-11. In the other words, there is increase in the shortage of girls per 1000 boys, from 87 in 2001 to 106 in 2011.As we can see in the figure 2.2, in 2011, Maharashtra CSR has fallen more drastically than the national CSR.

Fig. 2.2 Trends of Child Sex Ratios from 1991-2011, India and Maharashtra.




Source : Registrar General,1993, 2003, 2013

Table 2.1. Distribution of the Districts of Maharashtra by Child Sex Ratio, 2011.

| **Extremely low Child Sex ratio (Below 850)** | | |
|---|---|---|
| **District** | **2001** | **2011** |
| Bid | 894 | 807 |
| Jalgaon | 880 | 842 |
| **Very Low Child Sex Ratio (850-900)** | | |
| Ahmadnagar | 884 | 852 |
| Buldhana | 908 | 855 |
| Aurangabad | 890 | 858 |
| Osmanabad | 894 | 867 |
| Washim | 918 | 863 |
| Kolapur | 839 | 863 |
| Sangli | 851 | 867 |
| Jalna | 903 | 870 |
| Parbhani | 923 | 884 |
| Hingoli | 927 | 882 |
| Solapur | 895 | 883 |
| Pune | 902 | 883 |
| Latur | 918 | 889 |
| Nashik | 920 | 890 |
| Satara | 878 | 895 |
| Dhule | 907 | 898 |
| **Moderately Low Child Sex Ratio (900 to 925)** | | |
| Nanded | 929 | 910 |
| Akola | 933 | 912 |
| Mumbai(suburban) | 923 | 913 |
| Mumbai | 922 | 914 |
| Sindhudurg | 944 | 922 |
| Yavatmal | 933 | 922 |
| Wardha | 928 | 919 |
| Thane | 931 | 924 |
| **Near normal Child Sex Ratio (Above 925)** | | |
| Nagpur | 942 | 931 |
| Raigarh | 939 | 935 |
| Amravati | 941 | 935 |
| Ratnagiri | 952 | 936 |
| Nandurbar | 961 | 944 |
| Bhandara | 956 | 950 |
| Chandrapur | 939 | 953 |
| Gondia | 958 | 956 |
| Gadchiroli | 966 | 961 |

Source : Registrar general, 2013.

The whole range of data reveals that the sex ratio is unfavorable to girls and trends since 2001, appears to be quite alarming in the state except tribal districts like , Gadchiroli which has a CSR 961 and Gondia (956), Chandrapur (953) and Bhandara(950) and Nandurbar(944) . But all other 30 districts of Maharashtra showed unbalanced child sex ratio (Table 2.1).

In terms of CSR Bid District is at the bottom (807) followed by Jalgaon (842). In addition there are 16 districts where CSR is above 850 but below 900. This is a disturbing fact which needs to be studied deeply. Detailed spatial distribution of CSR through districts is discussed in next chapter.

## 2.5 Methodology

The study has been divided into four major parts. In the first part, we examine the child sex ratios of Census 1991, 2001 and 2011 for all districts in Maharashtra.

Secondly, we estimate the numbers of sex selective abortions taking place in the all districts in the state and the contribution of sex differentials in mortality to the imbalance in sex ratio is estimated. The shares of sex selective abortions and sex differentials in mortality to the number of total missing females are computed. The influences of socio economic conditions of a district and the density of ultrasound centres in the districts on the CSR and SRB are assessed. Finally, a field survey has been carried out in Satara district to examine the "Nakusa programmeme".

The methods used are described below .

***Calculation of child sex ratio(0-6)***

To show the child sex ratio (0-6), the common formula given below is used:

$CSR = (\text{Female population}_{0-6}/\text{male population}_{0-6})*1000$.....(1)

The international convention is of specifying the sex ratio (SR) as the number of males per 100 females. But in India it is females per thousand males, often called female to male ratio.

Information on 0-6 male and female population has been obtained from 1991, 2001 and 2011 censuses. After finding out the child sex ratios, we get an idea of the deficit of girls below 6 years of age. We can easily locate the areas where there is imbalance of child sex ratio.

***Estimation of the number of Sex Selective Abortions***

Next to obtain the number of sex selective abortions the procedure for reverse survival is adopted. The number of boys and girls of age 0-6 in 2001 and 2011 census is reverse survived to obtain the male and female births during 1994-2001 and 2004-2011respectively. This requires estimates of child survival for each sex. In India, the civil registration system does not have a good coverage in many areas and hence estimates of mortality from civil registration system cannot be accepted. The sample registration system gives estimates only at the state level but not for districts. The NFHS also does not give district level estimates. We have directly taken the estimates of child mortality (total, male, female under five mortality) from District wise Under Five Mortality estimates (based on 2001 Census) by which we arrive the values of probability of dying ($q_5$) and finally probability of surviving $l_5$, given as 100000 ($1-q_5$).

As census of India 2001 and 2011 give only 0-6 child population (age 0 to just below 7.0) so we have interpolated the value of ${}_7L_0$ by using integration. Estimates from the U.N. South Asian life tables, are taken into account since this pattern represents India well. By interpolation the values of ${}_5L_0$ corresponding to the $l_5$ value and $l_{10}$ using United Nations model life tables, South Asian pattern are used.

Estimated value of ${}_7L_0$ using integration and interpolation techniques

$${}_7L_0={}_5L_0+1.6l_5+0.4\,l_{10} \quad \ldots\ldots(2)$$

These refer to the period before 2001, roughly to 1996-97.

But we have to get child mortality for Census 2011, Ideally, Census 2011 data has to be used but due to the time lag in the release of the required information, the 2011 census

data are not available and hence census 2001 estimates of child mortality had to be used and extrapolated to the period of 2004-11.

In using 2001 information, the assumption has been that the pace of decline in district child mortality is synchronous with the state-level decline in child mortality. The assumption that all districts experienced the same degree of decline in child mortality as the state may seem to be a strong one.

The ratio of district-level child mortality estimates (q5) to the state level (q5) based on the children ever born and children surviving data of the 2001 Census was computed as below:

$\theta$ = [1000 – District q(5)] / [1000 – State q(5)] .....(3)

The district-level survival ratio ($_7L^D_0$) is computed by

$_7L^D_0 = 0.27 * (1-\theta) * 100000 + \theta * {}_7L^S_0$ .....(4)

Here the value of $_7L^S_0$ has been obtained from SRS life tables for Maharashtra for the period 2006-10, separately for males and females.

The next step involves the use of reverse survival. The number of children enumerated in the 0-6 age group is reverse survived by the appropriate survival ratio from $_7L_0$ (interpolated value) in order to get births which might have taken place during the last 7-year period before a census. Since data used are for 2001 and 2011 census, we get the female and male births during 1994-2001 and 2004-2011. The formula used is:

Male births $_{(t-7 \text{ to } t)}$ = Male population (0-6) $_{(t)}$*700000/$_7L_0$ .....(5)

Female births $_{(t-7 \text{ to } t)}$ = Female population (0-6) $_{(t)}$*700000/$_7L_0$ .....(6)

Where the $_7L_0$ values refer to a period just before the census date; precisely, it should be the seven year period prior to the census date; for estimating male births the $_7L_0$ value for males is used and for estimating female births, the $_7L_0$ value for females is used.

From the estimated numbers of male and female births, the sex ratio at birth for the seven year period prior to the census is computed. The methodology is similar to that used by Kumar and Sathyanarayana (2012).

Further to calculate the number of sex selective abortions, we estimate the expected female births if the sex ratio at birth had been normal; 105 male births per 100 female births is used as normal sex ratio.

The formula involved in this case is:

Expected female births = Male births $_{(t\text{-}7 \text{ to } t)}$ *100/105..... .....(7)

(assuming that the normal sex ratio at birth is 1.05)

The normal sex ratio at birth ( in absence of sex selective abortions) **NSRB**, equals 100*(EMB/EFB). Where EMB and EFB are Expected Male Births and Expected Female Births respectively. Further if there are no male sex selective abortions, then EMB=MB and hence the expected number of female Births (EFB) is given by applying the normal sex ratio at birth(NSRB) to the number of male births(MB) to yield

EFB= MB*[100/NSRB].....(8)

The value of NSRB, the normal sex ratio at birth is taken as 105. Universally, the ratio is between 103 and 107, generally close to 105, in the absence of any intervention.

Lastly, the number of sex selective abortions is deducted from the given formula:

No. of sex selective abortions = Expected no of female births $_{(t)}$ - Actual no of female births $_{(t)}$.....(9)

But not all births would have survived to the census date, and hence the number of missing girls is obtained as :

Total no of missing girls due to SSA $_{(t)}$ $= {}_7L_0$ /700000* no of sex selective abortions $_{(t-7 \text{ to } t)}$.....(10)

***Estimation of the impact of Excess Female Child Mortality***

It has been noted that sex ratio in India has been imbalanced due to excess female mortality. Here excess means more than what is expected for the given level of male mortality. For the age group (0-6) age group, the number of missing girls due to excess female mortality is given by the difference between the expected number of surviving girls and the actual number. It is calculated by the involving the male population, female population (0-6), female births during 1994-2001 or 2004-2011(calculated by reverse survival method), and life expectancies for females and males.

Expected Female mortality is calculated by formula given by Guilmoto. He assumed in the absence of specific discrimination against girls, mortality rates among boys across the world tend to be higher by about 20-25%. As a result, the mere fact that some female mortality rates observed in one area are equal to or higher than equivalent male rates signals the presence of discriminatory behavior among children.

Assuming that male mortality is higher than females by 20 percent,

Expected Female Under five mortality = Male mortality /1.20.....(11)

From this we have calculated expected $l_5$ for females and from this we have interpolated the values of ${}_5L_0$, $l_{10}$ to get expected values of ${}_7L_0$.

Expected number of girls $(0\text{-}6)_{(t)}$ = Female births $_{(t-7 \text{ to } t)}$ *$({}_7L_{0\,(t)}/700000)$..... (12)

Female births which we have calculated by reverse survival method are used here.

To analyze Census 2011 data, we have computed district-level survival ratios ( ${}_7L^D_0$ ) for both males and females separately, after that we calculated proportion living for males,

Proportion Living for (Males) = ${}_7L^D_0{}^{(M)}$ / 700000 .....(13)

Then eventually, Proportion Died for (Males) = 1 - Proportion Living for (Males) .....(14)

Expected (Female) Proportion Died = Proportion Died for (Males)/1.2.....(15)

Expected (Female) Proportion living = 1 – Expected (Female) Proportion Died.....(16)

We used Female births which we had calculated before by Reverse survival to calculate Expected female girls alive in 2011,

Expected Girls alive $_{(t)}$ = Female Births * Expected Female Proportion living .....(17)

Then we have calculated,

Missing girls due to excess female mortality $_{(t)}$ = expected number of girls (0-6) $_{(t)}$- Actual no of girls $_{(t)}$ .....(18)

Total missing girls are ultimately the summation of missing girls due to sex selective abortions and missing girls due to excess female child mortality which is simply given by:

Total missing girls = Missing girls due to Sex selective abortions + Missing girls due to excess female child mortality.....(19)

The overall approach is similar to that employed by Kulkarni (2007), and by Dutta (2008).

All estimates are assuming that sex selective misreporting is negligible in 2011 census, to that extent that there is such misreporting; the estimates would be affected.

**Interrelationship between SRB/CSR, density of scan centres and socioeconomic factors:**

This analysis tries to look what are the predictor factors that significantly affect the current, past and future trends of CSR. On which developmental factors, government

should focus to improve the level of CSR. So District level bivariate analysis tries to look the Child Sex Ratio with level of development of the district. Aggregate District level analysis of CSR has been done by some developmental indicators like Literacy rate , Economic Level of district, share of cultivators, work force Participation, level of irrigation, share of ST , number of scan centres.

Literature suggests, literacy level can affect the decision of family size, ideal number and sex composition of children. Per Capita Net Domestic Product is a good economic indicator which may influence fertility decisions. District's work force participation and share of cultivators may shape decisions about family size. Level of irrigation is the indicator of prosperity (as cash crops production may be high with high irrigation level) so one can interlink level of irrigation with CSR. Share of ST is a social indicator, so by interlinking CSR with share of ST, we can have idea of how societal status affects the CSR. Density of scan centres can have direct effect on CSR as per literature review.

Correlation and Regression analysis has been done between dependent variable SRB/CSR with independent developmental variables to get degree of association and net effect of predictor indicators on the dependent variable CSR.

**Nakushi Programme**: An exploration of factors of Unwantedness

An explorative study has been done in Satara district which has initiated the programme of renaming the girls whose names were "Nakusa/Nakushi".

Satara District is situated in prosperous western Maharashtra where sex imbalance is quite marked. In order to see how the programmeme was implemented and how it is perceived by the people, a field study was carried out in the district. From the list of Nakusa girls it was observed that girls from all ages till 20 were identified. The youngest girl who has named Nakusa was of 11 months old and oldest girls whose name was Nakusa was 20 years old at the time of survey. Researcher has selected villages where older girls can be interviewed to get the informative response. Villages with large number of such girls were identified where families of older 'Nakusa' girls were contacted and informal group discussions were carried out with married women above age 20 in order

to understand their views on value of son and daughter and sex selection. Besides that the detailed interviews were done of two girls and their parents from two different communities. Two Tehsils of "Satara" district, 'Wai' and 'Satara' were selected for interviewing "Nakusas" and to have group discussions for deep understanding of issue. In each tehsil , one village was chosen. 'Bavadhan' village from 'Wai' tehsil and 'Kanher' village from 'Satara' tehsil have been selected for this purpose.

Primary study includes key informants' interviews, case studies and focused group discussions in the Community and also discussions with district administrative officers, health professionals and social activists in Satara district. Discussions under primary the study helped to draw conclusions about programme, imbalances in CSR, and factors of sex selection and unwantedness of girls.

## 2.6 Sources of Data

Various sources of data were utilized to estimate numbers of sex selective abortions and missing girls. These are noted below.

1. Census of India (1991, 2001, 2011)
   The Indian census provides tabulation by age and sex allowing computation of sex ratios by age. This study has used (0-6) ages and sex wise data of Census of India 1991, 2001 and 2011.The Census data gives many developmental indicators like level of literacy, level of Urbanization, Share of ST, share of cultivators. So this data have been used for further analysis of CSR with level of development.

2. District wise Under Five Mortality estimates (based on 2001 Census) :
   The Office of Registrar General releases data on under five mortality rates by sex wise based on Brass method. District –level under five mortality rates ($_5q_0$) for census 2001 has been used to estimate male/female district wise survival ratios ($_5L_0$).

3. State Family Welfare Bureau, Government of Maharashtra, Pune.

   The Department of Health and Family Welfare (Government of Maharashtra) which is placed in Pune has provided data on district wise scan centres from 2001 to November 2011.

4. U.N. Model Life Tables, South Asian Pattern, U.N.(1983)

   District wise value of $_7$Lo (Survival Ratios) has been interpolated from values that are obtained from United Nation's South Asian Model life tables. We obtained $l_5$, $l_{10}$ and $_5L_0$ from life tables.

5. SRS (Sample Registration System ) life-tables (2006-10)

   The $_7L_0$ values are obtained from the SRS life tables for Maharashtra for the period 2006-10, separately for male and females.

6. Primary explorative survey

   For last chapter of "Nakusa Programme in Satara District" we have conducted a field survey. In this some households with girls whose names have been changed from "Nakusa" to other names by their wish are interviewed. We have interviewed some girls with "Nakusa" name. Group discussions were conducted in the communities where girls with names were "Nakusa/Nakushi" found in large number. We have interviewed government health officials and private practitioners in Health sector to get an idea of the ground situation and their views on the issue of sex selection and "Nakusa" name.

# Chapter 3

# Trends and Distribution of Child Sex Ratio in Maharashtra

# Chapter 3

# Trends and Distribution of Child Sex Ratio in Maharashtra

## 3.1 Introduction

The average sex ratio at birth worldwide (the number of male live births per 100 females births) is around 105 (Garenne, 2002) and may fluctuate over time within narrow limits (Gini 1955; James , 2000a; Pollard 1969). Given the normal sex ratio at birth of 105 boys per 100 girls, a ratio close to 105 is called as 'balanced'. In India the ratio is conventionally expressed in terms of females per 1000 males, or girls per 1000 boys. Thus a fall in this ratio marks an imbalance in child sex ratio and inclined towards masculinity.

According to demographers, both the natural sex ratio at birth and the population sex ratio are "remarkably consistent" across human populations in the absence of manipulation. The natural sex ratio at birth is 934–952 female births for every 1,000 male births. The slight excess of male births is balanced out in the population sex ratio as males have higher mortality rates than females (Hesketh and Xing 2006).

With the ongoing pace of fertility transition, couples are rather forced to achieve a desired sex composition of children within a limited allowance for the number of children. This is mentioned as dimension intensifying preferential fertility regulation leading to the distortion in sex ratios. (Sen, 1990) This has implications for population sex ratio if sex ratio at birth gets manipulated and also if there is sex selective neglect of children. The imbalance is often clearly reflected in the child sex ratio.

Child Sex Ratio is a one of the important indicators of gender equity of the population. An imbalance in Child Sex Ratio reflects underlying socioeconomic and cultural patterns of the society, especially its attitude towards the girl child. The Indian child sex ratio has shown a secular decline that is worsening of imbalance.

Given the evidence of increased masculinity in the child sex composition discussed earlier, we examine trends in child sex ratio in India and states with focus on Maharashtra. However, first, levels and trends in population sex ratios are presented.

Table 3.1 . Trends in Population Sex Ratio and Child Sex Ratio, India, 1991-2011

| | **Sex Ratio** | | |
|---|---|---|---|
| T/R/U | 1991 | 2001 | 2011 |
| Total | 926 | 933 | 943 |
| Rural | 938 | 946 | 949 |
| Urban | 894 | 900 | 929 |
| | **Child Sex Ratio** | | |
| Total | 945 | 927 | 919 |
| Rural | 948 | 933 | 923 |
| Urban | 935 | 906 | 905 |

Source: Registrar General, 2013.

Note: Sex Ratio is obtained by females per 1000 males.

### 3.2 Population Sex Ratio (SR) of India and States, 2011

Recently released Primary Census Abstract recorded Sex ratio of India as 943. It gives evidence that for the total population situation is improving, sex ratio has consistently increased from 927 in 1991 to 933 in 2001 and 943 in 2011(Table 3.1) .Excluding Union territories and Delhi , Haryana recorded the lowest (879) overall sex ratio (Table 3.2) followed by Punjab (895). Utter Pradesh and Bihar, states from Northern India and Gujarat (western state of India) recorded Sex ratio below 920. Rajasthan, Madhya Pradesh, Maharashtra showed Sex ratio on an average 930. Sex ratio scenario is perfectly showing regional divide, North and North western states are showing low sex ratio. Except Sikkim (890) all other North Eastern states showed close to 950 or higher sex ratios. Kerala state from south region has highest Sex ratio (1037). Other states from south and eastern region have quite good range of overall Sex ratio (Fig 3.1).

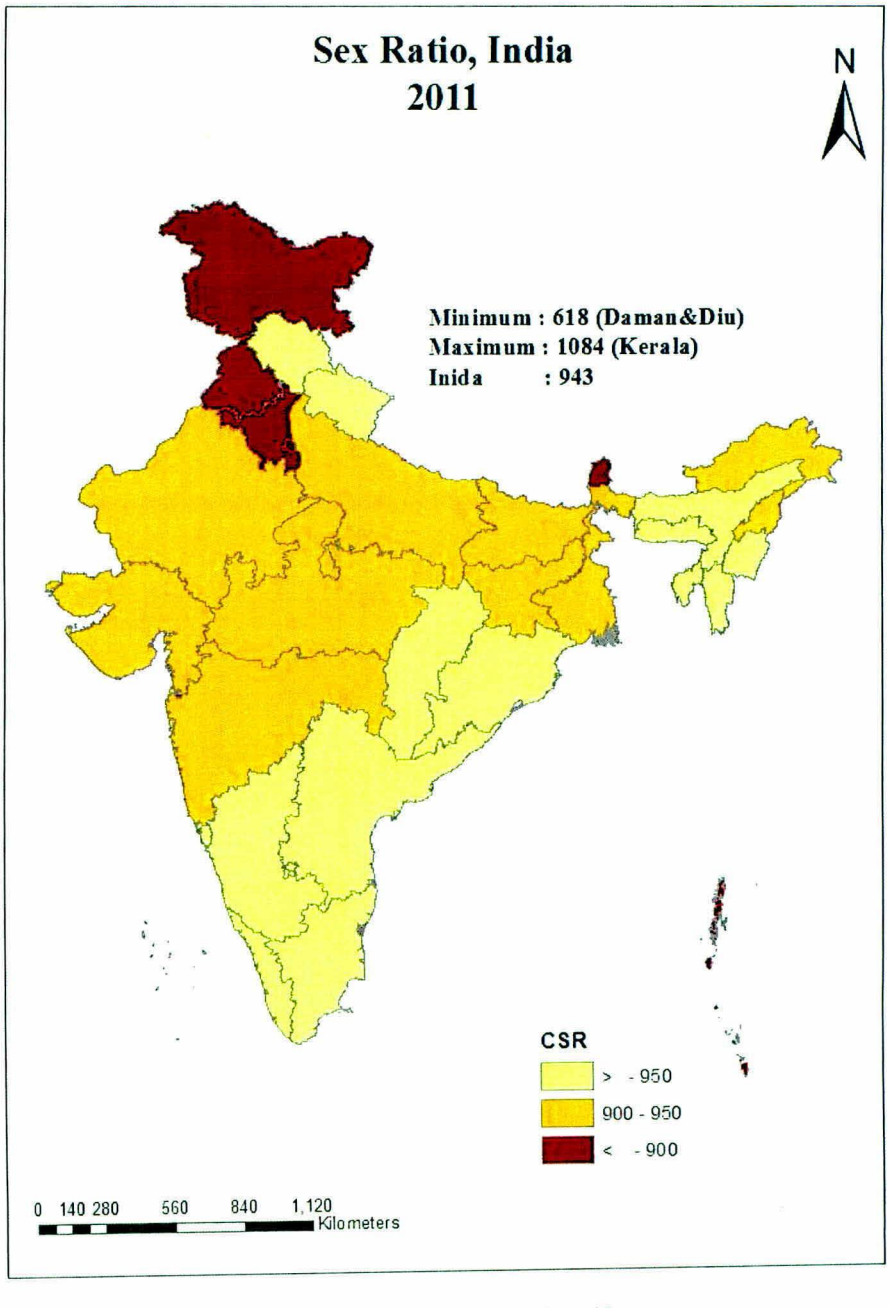
Table 3.2. Population Sex Ratio and Child Sex Ratio by place of residence, Census of 2011.

| State | SR(Total) | SR(Urban) | SR(Rural) | CSR(Total) | CSR(Urban) | CSR(Rural) |
|---|---|---|---|---|---|---|
| India | 943 | 929 | 949 | 919 | 905 | 923 |
| Jammu & Kashmir | 889 | 840 | 908 | 862 | 850 | 865 |
| Himachal Pradesh | 972 | 853 | 986 | 909 | 881 | 912 |
| Punjab | 895 | 875 | 907 | 846 | 852 | 844 |
| Chandigarh | 818 | 822 | 690 | 880 | 880 | 871 |
| Uttarakhand | 963 | 884 | 1000 | 890 | 868 | 899 |
| Haryana | 879 | 873 | 882 | 834 | 832 | 835 |
| Nct Of Delhi | 868 | 868 | 852 | 871 | 873 | 814 |
| Rajasthan | 928 | 914 | 933 | 888 | 874 | 892 |
| Uttar Pradesh | 912 | 894 | 918 | 902 | 885 | 906 |
| Bihar | 918 | 895 | 921 | 935 | 912 | 938 |
| Sikkim | 890 | 913 | 882 | 957 | 934 | 964 |
| Arunachal Pradesh | 938 | 890 | 953 | 972 | 957 | 975 |
| Nagaland | 931 | 908 | 940 | 943 | 973 | 933 |
| Manipur | 992 | 1026 | 976 | 936 | 949 | 931 |
| Mizoram | 976 | 998 | 952 | 970 | 974 | 966 |
| Tripura | 960 | 973 | 955 | 957 | 947 | 960 |
| Meghalaya | 989 | 1001 | 986 | 970 | 954 | 972 |
| Assam | 958 | 946 | 960 | 962 | 944 | 964 |
| West Bengal | 950 | 944 | 953 | 956 | 947 | 959 |
| Jharkhand | 948 | 910 | 961 | 948 | 908 | 957 |
| Odisha | 979 | 932 | 989 | 941 | 913 | 946 |
| Chhattisgarh | 991 | 956 | 1001 | 969 | 937 | 977 |
| Madhya Pradesh | 931 | 918 | 936 | 918 | 901 | 923 |
| Gujarat | 919 | 880 | 949 | 890 | 852 | 914 |
| Daman & Diu | 618 | 551 | 864 | 904 | 894 | 932 |
| Dadra & Nagar Haveli | 774 | 682 | 863 | 926 | 872 | 970 |
| Maharashtra | 929 | 903 | 952 | 894 | 899 | 890 |
| Andhra Pradesh | 993 | 987 | 996 | 939 | 935 | 941 |
| Karnataka | 973 | 963 | 979 | 948 | 946 | 950 |
| Goa | 973 | 956 | 1003 | 942 | 940 | 945 |
| Lakshadweep | 946 | 945 | 952 | 911 | 911 | 911 |
| Kerala | 1084 | 1091 | 1078 | 964 | 963 | 965 |
| Tamil Nadu | 996 | 1000 | 993 | 943 | 952 | 936 |
| Pondicherry | 1037 | 1042 | 1028 | 967 | 975 | 953 |
| Andaman & Nicobar Islands | 876 | 874 | 877 | 968 | 954 | 976 |

Source : Registrar General, 2013

All Union territories except Pondicherry (1037) have very low sex ratio which fact should be matter of concern. Daman and Diu recorded lowest Sex ratio of 618. Similarly disturbing sex ratio recorded in Dadra and Nagar Haveli. Only 818 women are there per thousand males in planned city Chandigarh. National Capital Region (NCT) of Delhi has only 868 women per thousand males (table 3.2).

Fig 3.1. Population Sex Ratio, India, 2011.




Source: Registrar General, 2013.

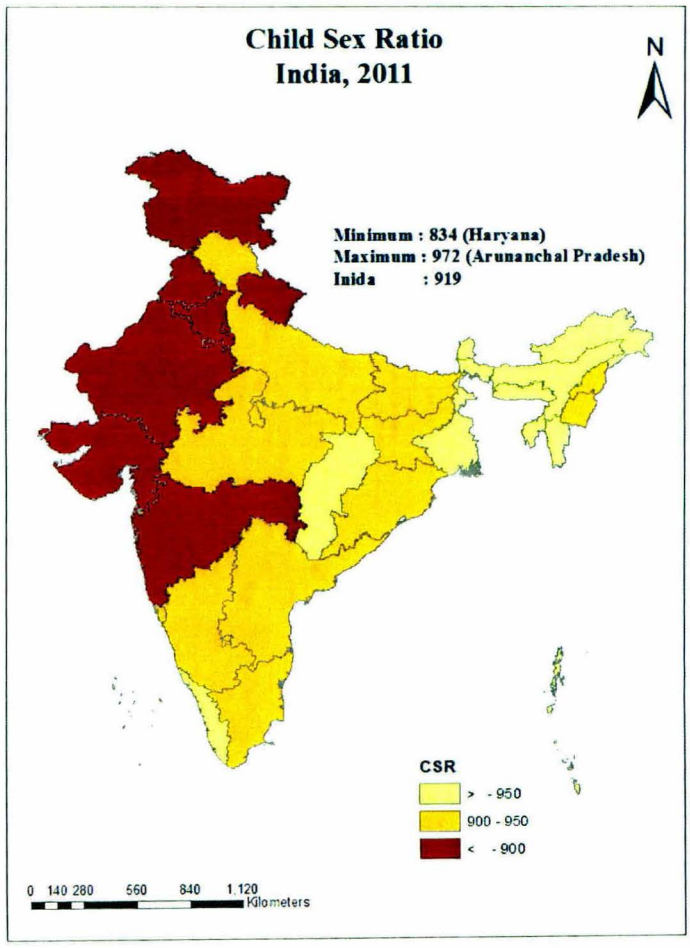
The population sex ratio is lower in Urban areas (929) than in rural areas (949) in India and states and this has been so even in the past (Table 3.1). It is well known that the population sex ratio is influenced by sex selective migration and hence shows imbalances in urban areas and states with heavy migration. On the other hand, the child sex ratio is not much influenced by migration and hence imbalances in the child sex ratio cause concern.

### 3.3 Child Sex Ratio (CSR) of India and States, 2011

India as a whole has 919 girls per thousand boys. The CSR has declined over time which is a matter of serious concern. It has declined by 18 points from 1991(945) to 2001 (927) and further by 8 points (Table 3.1).

Among states, Haryana recorded the lowest CSR of 834 in 2011 showing a huge deficit. Punjab is the second state which has worst Child sex ratios of 846 followed by developed states like Delhi (871) and Maharashtra (894). Rajasthan (888), Uttarakhand (890) and Jammu and Kashmir (862) also showed CSR below 900 (Table 3.2). Odisha, Jharkhand, Assam, Himachal Pradesh (909) showed CSR below 950. As usual northern and western part of India face imbalance in CSR (Fig 3.2).

Fig 3.2 Child Sex Ratio, India, 2011




Source: Registrar General, 2013.

### 3.4 Trends in population sex ratio in Maharashtra, 1991-2011

Maharashtra recorded overall sex ratio 929 females per thousand males in 2011 which showed slight improvement by seven points from 922 in census 2001.It is below national average as national sex ratio is 943 (Table. 3.3).

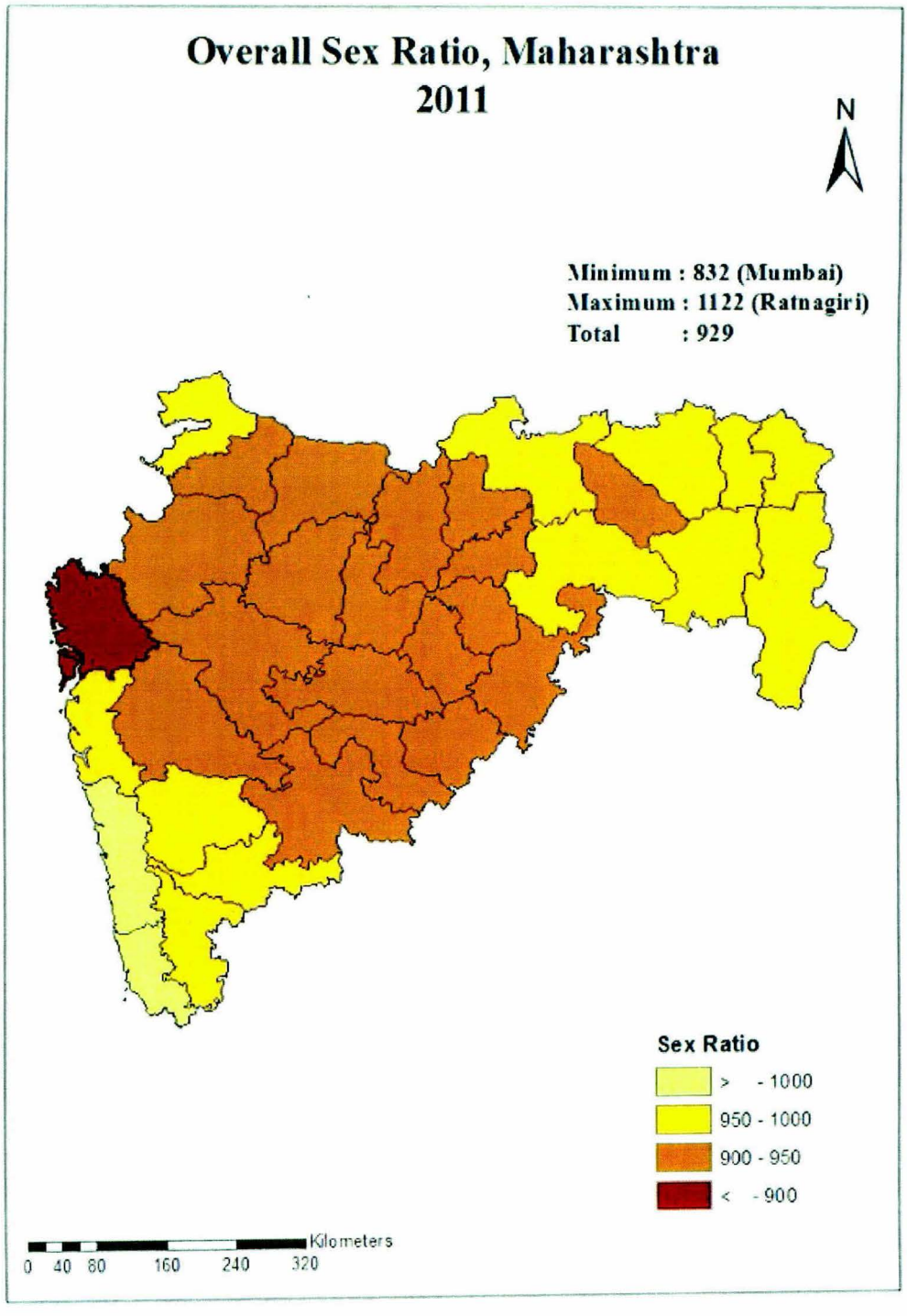
Sex ratio is 832 in Mumbai district which is the lowest in the State. It is 860 in Mumbai Suburban district and 886 in Thane. However, in all these three districts, it has increased during 2001-11(Fig. 3.3). Ratnagiri district has the highest sex ratio (1122), followed by Sindhudurg (1036) and Gondiya (999). Sindhudurg with 1036 sex ratio shows sharp decline about 43 points (Table 3.3). Mumbai district showed highest increase of 55 points from 777(2001) to 832 (2011). Pune, Bid, Latur, Jalgoan, Osmanabad having Sex ratio below 925. Sex ratio in these districts has declined sharply.

Table 3.3. Trends in Population Sex Ratio from 1991, 2002 and 2011 and changes between 1991-11.

| No. | State/District | Sex Ratio (Overall) | | | Difference between 2001-1991 | Difference between 2011-2001 | Difference between 2011- 1991 |
|---|---|---|---|---|---|---|---|
| | | 1991 | 2001 | 2011 | | | |
| | MAHARASHTRA | 934 | 922 | 929 | -12 | 7 | -5 |
| 1 | Nandurbar | 975 | 977 | 978 | 2 | 1 | 3 |
| 2 | Dhule | 945 | 944 | 946 | -1 | 2 | 1 |
| 3 | Jalgaon | 940 | 933 | 925 | -7 | -8 | -15 |
| 4 | Buldana | 953 | 946 | 934 | -7 | -12 | -19 |
| 5 | Akola | 934 | 938 | 946 | 4 | 8 | 12 |
| 6 | Washim | 946 | 939 | 930 | -7 | -9 | -16 |
| 7 | Amravati | 936 | 938 | 951 | 2 | 13 | 15 |
| 8 | Wardha | 939 | 935 | 946 | -4 | 11 | 7 |
| 9 | Nagpur | 922 | 932 | 951 | 10 | 19 | 29 |
| 10 | Bhandara | 980 | 981 | 982 | 1 | 1 | 2 |
| 11 | Gondiya | 995 | 1005 | 999 | 10 | -6 | 4 |
| 12 | Gadchiroli | 976 | 976 | 982 | 0 | 6 | 6 |
| 13 | Chandrapur | 948 | 948 | 961 | 0 | 13 | 13 |
| 14 | Yavatmal | 951 | 942 | 952 | -9 | 10 | 1 |
| 15 | Nanded | 945 | 942 | 943 | -3 | 1 | -2 |
| 16 | Hingoli | 952 | 953 | 942 | 1 | -11 | -10 |
| 17 | Parbhani | 954 | 958 | 947 | 4 | -11 | -7 |
| 18 | Jalna | 958 | 951 | 937 | -7 | -14 | -21 |
| 19 | Aurangabad | 922 | 925 | 923 | 3 | -2 | 1 |
| 20 | Nashik | 940 | 927 | 934 | -13 | 7 | -6 |
| 21 | Thane | 879 | 858 | 886 | -21 | 28 | 7 |
| 22 | Mumbai (Suburban) | 831 | 822 | 860 | -9 | 38 | 29 |
| 23 | Mumbai | 791 | 777 | 832 | -14 | 55 | 41 |
| 24 | Raigarh | 1010 | 976 | 959 | -34 | -17 | -51 |
| 25 | Pune | 933 | 919 | 915 | -14 | -4 | -18 |
| 26 | Ahmadnagar | 949 | 940 | 939 | -9 | -1 | -10 |
| 27 | Bid | 944 | 936 | 916 | -8 | -20 | -28 |
| 28 | Latur | 942 | 935 | 928 | -7 | -7 | -14 |
| 29 | Osmanabad | 937 | 932 | 924 | -5 | -8 | -13 |
| 30 | Solapur | 934 | 935 | 938 | 1 | 3 | 4 |
| 31 | Satara | 1029 | 995 | 988 | -34 | -7 | -41 |
| 32 | Ratnagiri | 1205 | 1136 | 1122 | -69 | -14 | -83 |
| 33 | Sindhudurg | 1137 | 1079 | 1036 | -58 | -43 | -101 |
| 34 | Kolhapur | 961 | 949 | 957 | -12 | 8 | -4 |
| 35 | Sangli | 958 | 957 | 966 | -1 | 9 | 8 |

Source: Registrar General, 1991, 2001, 2013.

Fig 3.3. Population Sex Ratio in districts of Maharashtra, 2011.




Source: Registrar General, 2013.

### 3.5 Population Sex Ratio in 2011 and spatial variations in Maharashtra

Maharashtra recorded overall sex ratio as 929. Rural Maharashtra has sex ratio of 952 and urban sex ratio 903. There is difference of 49 points between rural and urban areas. Ratnagiri district recorded highest sex ratio as 1122 followed by Sindhudurg (1036) and Gondia (999). Mumbai district has the lowest sex ratio of 832 followed by developed districts like Mumbai Suburb and Thane. Pune (915), Bid(916), Osmanabad (924), Latur (928) region showed CSR below 930. All other districts had fairly balanced sex ratios. The spatial variations can be seen in fig. 3.4

Population sex ratio in rural region is well above state average of sex ratios. Except Bid district (lowest SR of 912), all other districts have Rural SR higher than 920 (table 3.4). Districts from Central (Aurangabad, Washim, Jalgaon) and south central border districts (Solapur and Osmanabad) showed low range of SR (less than 930). Ratnagiri showed the highest rural sex ratio (1144) followed by Sindhudurg (1044) and Gondiya (1001). All other districts have ratios in the range of 930 to 1000 range of SR.

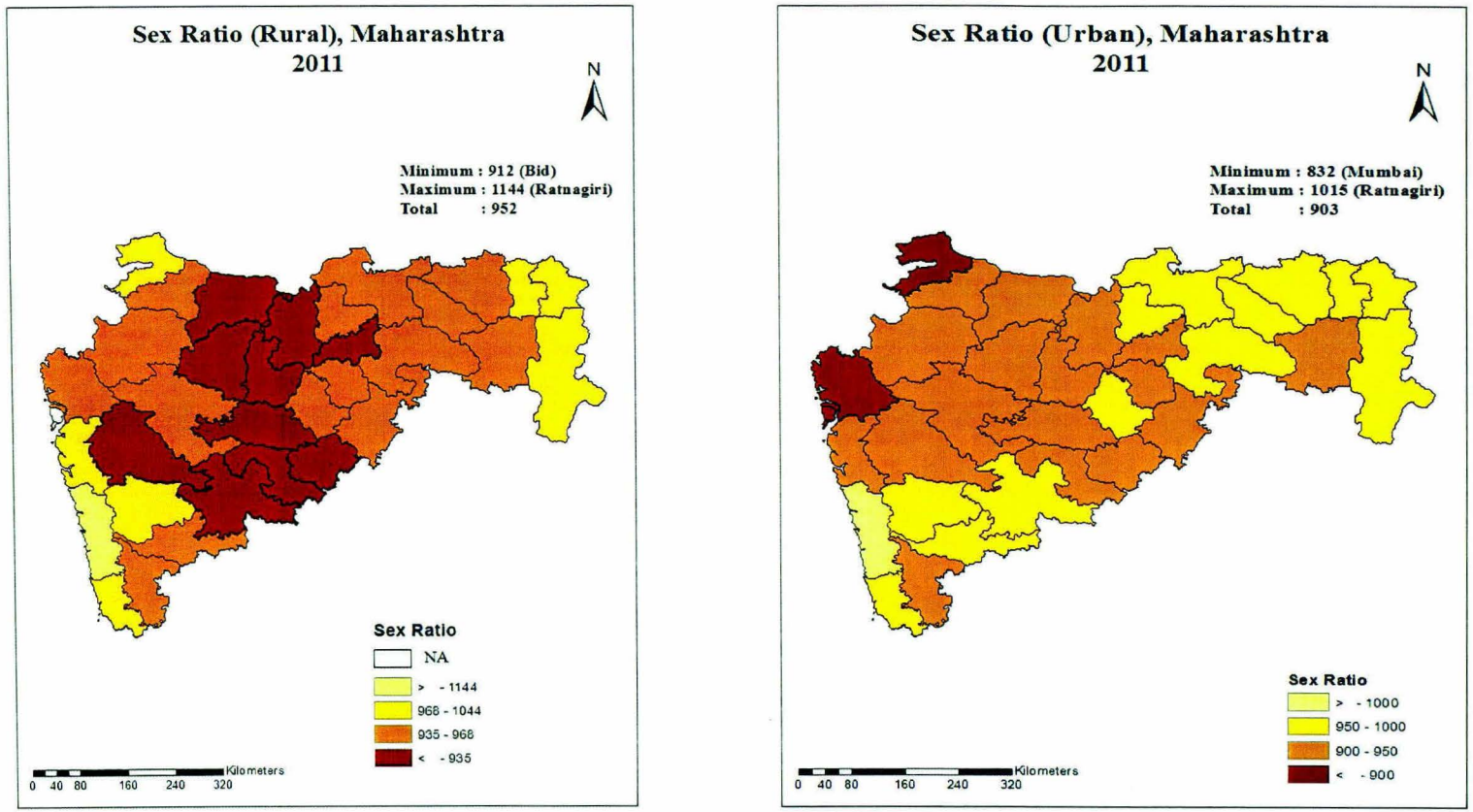
Population sex ratio in urban areas of Maharashtra has mixed scenario. Urban Maharashtra shows a ratio of 903 (Table 3.4). This is quite low. Mumbai city has the lowest Sex Ratio; it has only 832 females per thousand males. This is known to be because of huge male migration into the city. Then Mumbai Suburban district (860) and Thane Urban district (865) showed low number of females per 1000 males followed by Nandurbar district (893). Urban areas of Pune (904) and Raigarh district (912) which is bordering Mumbai also showed this low females pattern (Fig.3.4). Sex ratios of urban Nasik (920), Aurangabad (923) and Jalgaon (927) are significantly lower compared with rural areas of districts. The spatial pattern shown in fig 3.4.

Table 3.4. Population Sex ratio and Child Sex Ratio in districts of Maharashtra by Census of 2011.

| State/Dist. | SR(Total) | SR(Rural) | SR(Urban) | CSR(Total) | CSR(Rural) | CSR(Urban) |
|---|---|---|---|---|---|---|
| MAHARASHTRA | 929 | 952 | 903 | 894 | 890 | 899 |
| Nandurbar | 978 | 996 | 893 | 944 | 953 | 885 |
| Dhule | 946 | 950 | 935 | 898 | 906 | 872 |
| Jalgaon | 925 | 924 | 927 | 842 | 842 | 841 |
| Buldana | 934 | 931 | 944 | 855 | 852 | 864 |
| Akola | 946 | 940 | 954 | 912 | 918 | 903 |
| Washim | 930 | 926 | 947 | 863 | 860 | 878 |
| Amravati | 951 | 947 | 957 | 935 | 943 | 919 |
| Wardha | 946 | 942 | 955 | 919 | 926 | 902 |
| Nagpur | 951 | 945 | 954 | 931 | 941 | 926 |
| Bhandara | 982 | 983 | 981 | 950 | 955 | 930 |
| Gondiya | 999 | 1001 | 988 | 956 | 959 | 938 |
| Gadchiroli | 982 | 984 | 966 | 961 | 966 | 917 |
| Chandrapur | 961 | 968 | 950 | 953 | 964 | 930 |
| Yavatmal | 952 | 950 | 962 | 922 | 929 | 893 |
| Nanded | 943 | 945 | 937 | 910 | 915 | 895 |
| Hingoli | 942 | 941 | 946 | 882 | 884 | 872 |
| Parbhani | 947 | 942 | 958 | 884 | 875 | 905 |
| Jalna | 937 | 935 | 944 | 870 | 862 | 909 |
| Aurangabad | 923 | 924 | 923 | 858 | 851 | 867 |
| Nashik | 934 | 945 | 920 | 890 | 890 | 890 |
| Thane | 886 | 958 | 865 | 924 | 961 | 911 |
| Mumbai Suburban | 860 | - | 860 | 913 | | 913 |
| Mumbai | 832 | - | 832 | 914 | | 914 |
| Raigarh | 959 | 988 | 912 | 935 | 949 | 913 |
| Pune | 915 | 932 | 904 | 883 | 871 | 892 |
| Ahmadnagar | 939 | 938 | 942 | 852 | 849 | 866 |
| Bid | 916 | 912 | 933 | 807 | 796 | 854 |
| Latur | 928 | 926 | 932 | 889 | 889 | 889 |
| Osmanabad | 924 | 922 | 934 | 867 | 867 | 870 |
| Solapur | 938 | 922 | 972 | 883 | 874 | 907 |
| Satara | 988 | 995 | 959 | 895 | 897 | 889 |
| Ratnagiri | 1122 | 1144 | 1015 | 936 | 937 | 932 |
| Sindhudurg | 1036 | 1044 | 979 | 922 | 926 | 897 |
| Kolhapur | 957 | 962 | 947 | 863 | 862 | 865 |
| Sangli | 966 | 963 | 973 | 867 | 859 | 889 |

Source: Registrar General, 2013.

Fig 3.4. Population Sex Ratio in Rural and Urban areas of Maharashtra, 2011

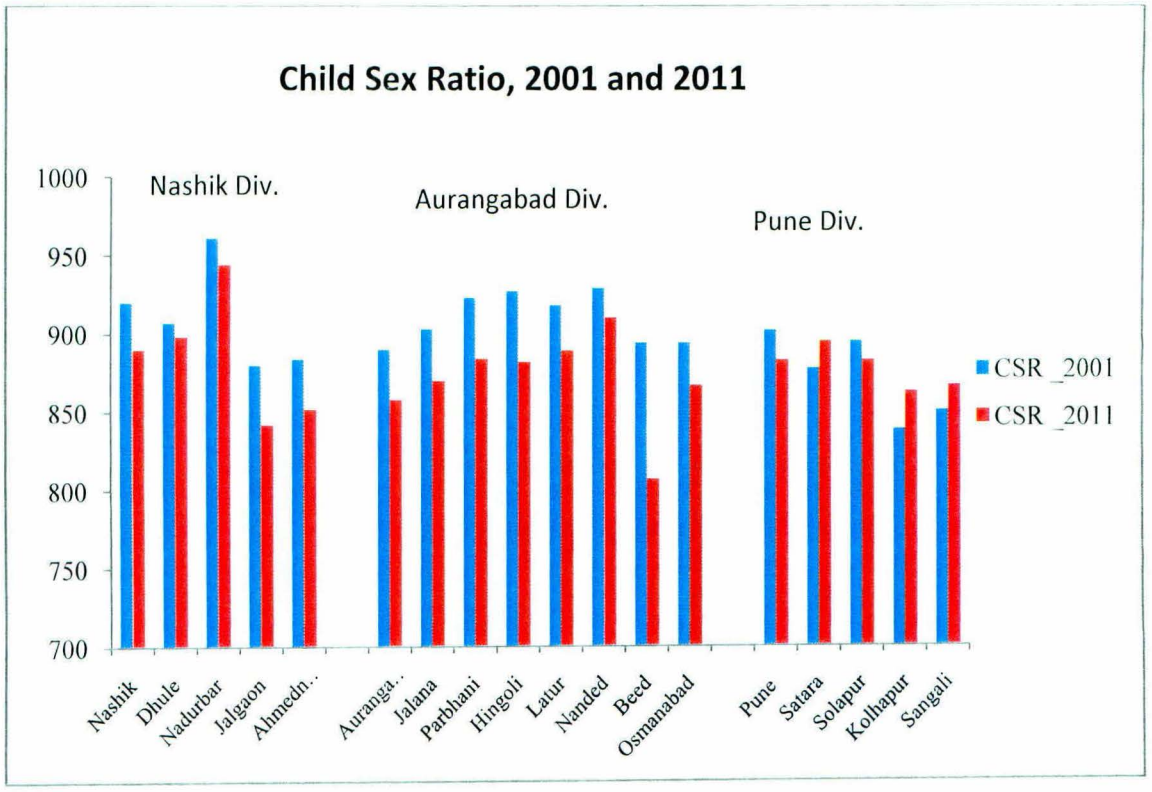



Source : Registar General, 2013 .

### 3.6 Child Sex Ratio in Maharashtra: Trends, Declinations and Spatial Variations

In 2011, the child sex ratio was the lowest in Bid district, 807, where it declined by 86 girls as against the child sex ratio 894 in 2001. Gadchiroli has recorded the highest child sex ratio 961 followed by Chandrapur with 953 (Fig. 3.6).

Fig 3.5 . Child Sex Ratio, 2001 and 2011.

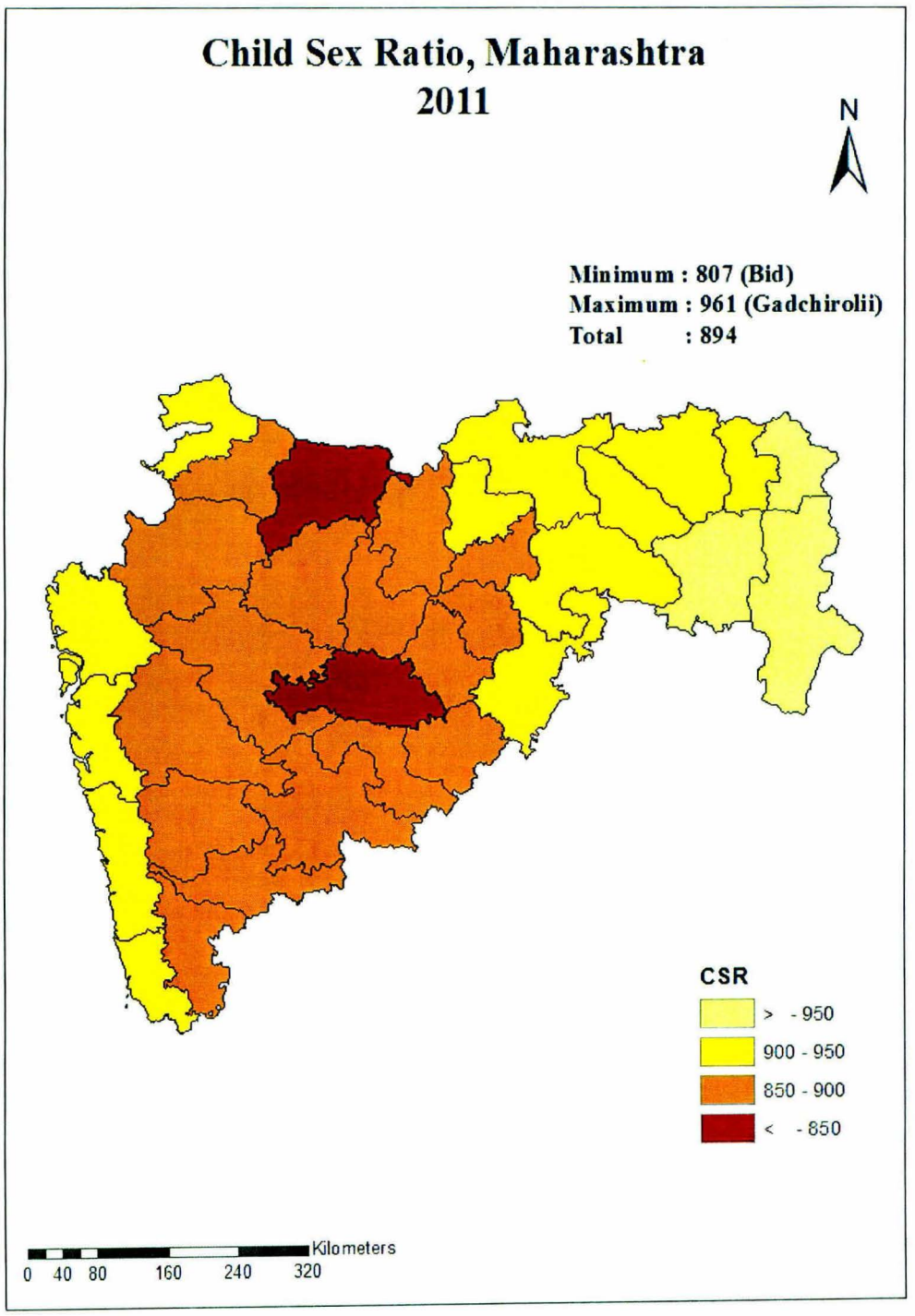



Source : Registrar General Office , Census 2011.

After 2001, many districts of Western Maharashtra show some reversal in CSR but central Maharashtra shows a steep fall as seen in fig. 3.5.

Bid District (CSR 807) has shown sharp decline in Child sex ratios with almost 86 points from 2001 and 132 point from 1991 and thus became the district with the lowest Child Sex Ratio in Maharashtra. Jalana district (870) has also shown notable decline in CSR with 33 points from 2001 Census and 81 points from 1991 Census (Table 3.5).

Fig 3.6 . Child Sex Ratio, Districts of Maharashtra, 2011.




Source: census of India 2011.

Table 3.5. Recent trends in Child Sex ratio in Districts of Maharashtra, Census 1991, 2001, and 2011.

| No. | State/district | CSR (1991) | CSR (2001) | CSR (2011) | Difference between 2001 and 1991 | Difference between 2011 and 2001 | Difference between 2011 and 1991 |
|---|---|---|---|---|---|---|---|
| | MAHARASHTRA | 946 | 913 | 894 | -33 | -19 | -52 |
| 1 | Nandurbar | 977 | 961 | 944 | -16 | -17 | -33 |
| 2 | Dhule | 947 | 907 | 898 | -40 | -9 | -49 |
| 3 | Jalgaon | 925 | 880 | 842 | -45 | -38 | -83 |
| 4 | Buldana | 945 | 908 | 855 | -37 | -54 | -90 |
| 5 | Akola | 929 | 933 | 912 | 4 | -21 | -17 |
| 6 | Washim | 941 | 918 | 863 | -23 | -55 | -78 |
| 7 | Amravati | 950 | 941 | 935 | -9 | -6 | -15 |
| 8 | Wardha | 952 | 928 | 919 | -24 | -10 | -33 |
| 9 | Nagpur | 951 | 942 | 931 | -9 | -11 | -20 |
| 10 | Bhandara | 964 | 956 | 950 | -8 | -6 | -14 |
| 11 | Gondiya | 978 | 958 | 956 | -20 | -2 | -22 |
| 12 | Gadchiroli | 980 | 966 | 961 | -14 | -4 | -19 |
| 13 | Chandrapur | 965 | 939 | 953 | -26 | 13 | -12 |
| 14 | Yavatmal | 961 | 933 | 922 | -28 | -11 | -39 |
| 15 | Nanded | 960 | 929 | 910 | -31 | -19 | -50 |
| 16 | Hingoli | 953 | 927 | 882 | -26 | -45 | -71 |
| 17 | Parbhani | 956 | 923 | 884 | -33 | -39 | -72 |
| 18 | Jalna | 951 | 903 | 870 | -48 | -33 | -81 |
| 19 | Aurangabad | 933 | 890 | 858 | -43 | -33 | -75 |
| 20 | Nashik | 954 | 920 | 890 | -34 | -30 | -64 |
| 21 | Thane | 952 | 931 | 924 | -21 | -7 | -28 |
| 22 | Mumbai (Suburban) | 930 | 923 | 913 | -7 | -10 | -17 |
| 23 | Mumbai | 942 | 922 | 914 | -20 | -8 | -28 |
| 24 | Raigarh | 961 | 939 | 935 | -22 | -3 | -26 |
| 25 | Pune | 943 | 902 | 883 | -41 | -19 | -60 |
| 26 | Ahmadnagar | 949 | 884 | 852 | -65 | -32 | -97 |
| 27 | Bid | 939 | 894 | 807 | -45 | 86 | -132 |
| 28 | Latur | 947 | 918 | 889 | -29 | -29 | -58 |
| 29 | Osmanabad | 947 | 894 | 867 | -53 | -27 | -80 |
| 30 | Solapur | 935 | 895 | 883 | -40 | -11 | -52 |
| 31 | Satara | 941 | 878 | 895 | -63 | 17 | -46 |
| 32 | Ratnagiri | 961 | 952 | 936 | -9 | -16 | -25 |
| 33 | Sindhudurg | 963 | 944 | 922 | -19 | -22 | -41 |
| 34 | Kolhapur | 931 | 839 | 863 | -92 | 24 | -68 |
| 35 | Sangli | 924 | 851 | 867 | -73 | 15 | -57 |

Source : Registrar General, 2013.

Table 3.6. The range in Child Sex Ratio in districts of Maharashtra, 1991, 2001, 2011.

| Maharshtra/ Region | Distribution of districts according to CSR | | | | Total no. of districts |
|---|---|---|---|---|---|
| | < 850 | 850-900 | 900-925 | >925 | |
| Total- 1991 | 0(0.0) | 0(0.0) | 1(3.3) | 29(96.7) | 30(100) |
| Total-2001 | 0(0.0) | 9(25.7) | 10(28.6) | 16(45.7) | 35(100) |
| Total-2011 | 2(5.7) | 16(45.7) | 8(22.9) | 9(25.7) | 35(100) |
| Urban-2011 | 1(2.9) | 18(51.4) | 11(31.4) | 5(14.4) | 35(100) |
| Rural-2011 | 2(6.1) | 15(45.5) | 3(9.1) | 13(39.4) | 33(100) |

Source: Registrar General, 1991, 2001, 2011.

Maharashtra state has two districts with CSR below 850; Jalgaon (842) and Bid (807) had disturbingly very low child sex ratios. Majority of districts have CSR in the range of 850-900. Sixteen districts (nearly 46%) have CSR below 900. All districts of Western and Central Maharashtra do come in this range. Around 23 % districts (8 districts) come in the 900-925 range of CSR including Mumbai, Mumbai suburb, Sindhudurg, Wardha and Akola. Nine districts (26%) have CSR above 925 and close to normal. Some of these have a large tribal population (Table 3.6).

Analysis of CSR in rural areas found 2 districts having CSR below 850. Those districts are Bid (796) and Jalgaon(842). Fifteen districts (45.5%) showed CSR in between 850-900 and. 3 districts found CSR in the range of 900-925. Nanded, Akola, i.e. central districts are coming in this range. Thirteen districts (39.4%) are in range above CSR 925; these include Raigarh, Thane, Ratnagiri, Nagpur, Bhandara, Gondiya. Here except Thane other districts are less developed.

In urban areas, only one district Jalgaon has CSR below 850. A large number of districts having CSR in the range of 850-900, around 18 districts (51.4% of total 35 districts) are coming in this category. Bid, Ahmadnagar, Buldhana and most of western and central districts are covered in this group. Eleven districts (31.4%) showed CSR in between 900-925 (Table 3.6). Most of the eastern districts are coming in this category with western belt like Mumbai, Mumbai Suburb. Only 5 districts have urban CSR above 925 and these

are Ratnagiri and Gondia Chandrapur, Bhandara and Gadchiroli four of these are in the eastern region of Maharashtra, where a large proportion of the population is tribal.

**CSR trends from 1991-2011 by place of residence**

The CSR in rural Maharashtra has fallen from 953 (1991) to 916 (2001) to 890 (2011). It has shown 63 points decline from 1991 to 2011 (Table 3.7). By alternative explanation we can say there is an additional deficit of 63 girls per 1000 boys in 2011 than in 1991 (Table 3.7). Bid, Ahmadnagar Aurangabad showed decline of more than 100 girls per thousand boys over the past 20 years. Rural areas of Kolhapur, Dhule, Osmanabad, Jalgaon, Parbhani also showed decline in CSR by more than 60 points since 1991(Map 3.7).

District wise Urban CSR showed decline of more than 20 girls in majority of districts except Gondiya, Bhandara and Akola. Urban CSR of whole Maharashtra state has decline from 934 (1991) to 908 (2001) to 899 (2011) (Table3.8). It means state faced deficit of 35 girls per 1000 boys from 1991 to 2011. Ahmadnagar and Osmanabad , Bid Latur, Jalgaon districts showed more than 70 points decline in Urban CSR. Decline in urban CSR is more prominently found in middle and eastern districts of Maharashtra than western Maharashtra. (Map. 3.8)

Table 3.7. Trends in Child Sex Ratio of Rural area from 1991, 2001 and 2011 and changes between 1991-11, Districts of Maharashtra.

| State/Dist. | Rural CSR 1991 | Rural CSR 2001 | Rural CSR 2011 | Difference in CSR (2001-1991) | Difference in CSR (2011-2001) | Difference in CSR (2011-1991) |
|---|---|---|---|---|---|---|
| MAHARASHTRA | 953 | 916 | 890 | -37 | -26 | -63 |
| Nandurbar | 968 | 971 | 953 | 3 | -17 | -14 |
| Dhule | 968 | 917 | 906 | -51 | -11 | -61 |
| Jalgaon | 929 | 885 | 842 | -43 | -43 | -87 |
| Buldana | 948 | 914 | 852 | -35 | -61 | -96 |
| Akola | 940 | 937 | 918 | -3 | -19 | -22 |
| Washim | 941 | 913 | 860 | -28 | -53 | -81 |
| Amravati | 952 | 946 | 943 | -6 | -3 | -8 |
| Wardha | 951 | 938 | 926 | -12 | -12 | -24 |
| Nagpur | 958 | 955 | 941 | -3 | -14 | -17 |
| Bhandara | 975 | 958 | 955 | -17 | -4 | -21 |
| Gondiya | 975 | 961 | 959 | -15 | -1 | -16 |
| Gadchiroli | 983 | 967 | 966 | -16 | -1 | -17 |
| Chandrapur | 970 | 957 | 964 | -13 | 7 | -6 |
| Yavatmal | 965 | 937 | 929 | -28 | -8 | -36 |
| Nanded | 961 | 929 | 915 | -31 | -14 | -46 |
| Hingoli | 957 | 929 | 884 | -28 | -45 | -74 |
| Parbhani | 957 | 929 | 875 | -28 | -55 | -83 |
| Jalna | 953 | 902 | 862 | -51 | -40 | -91 |
| Aurangabad | 954 | 893 | 851 | -61 | -42 | -103 |
| Nashik | 961 | 930 | 890 | -31 | -40 | -71 |
| Thane | 973 | 966 | 961 | -6 | -5 | -11 |
| Mumbai (Suburban) | - | - | - | - | - | - |
| Mumbai | - | - | - | - | - | - |
| Raigarh | 967 | 946 | 949 | -21 | 3 | -18 |
| Pune | 943 | 904 | 871 | -39 | -34 | -73 |
| Ahmadnagar | 951 | 887 | 849 | -63 | -38 | -102 |
| Bid | 941 | 893 | 796 | -48 | -97 | -145 |
| Latur | 951 | 921 | 889 | -30 | -32 | -62 |
| Osmanabad | 946 | 894 | 867 | -52 | -27 | -80 |
| Solapur | 935 | 888 | 874 | -48 | -14 | -62 |
| Satara | 945 | 881 | 897 | -64 | 15 | -49 |
| Ratnagiri | 961 | 957 | 937 | -5 | -19 | -24 |
| Sindhudurg | 963 | 945 | 926 | -18 | -19 | -37 |
| Kolhapur | 938 | 842 | 862 | -96 | 20 | -76 |
| Sangli | 927 | 850 | 859 | -77 | 9 | -68 |

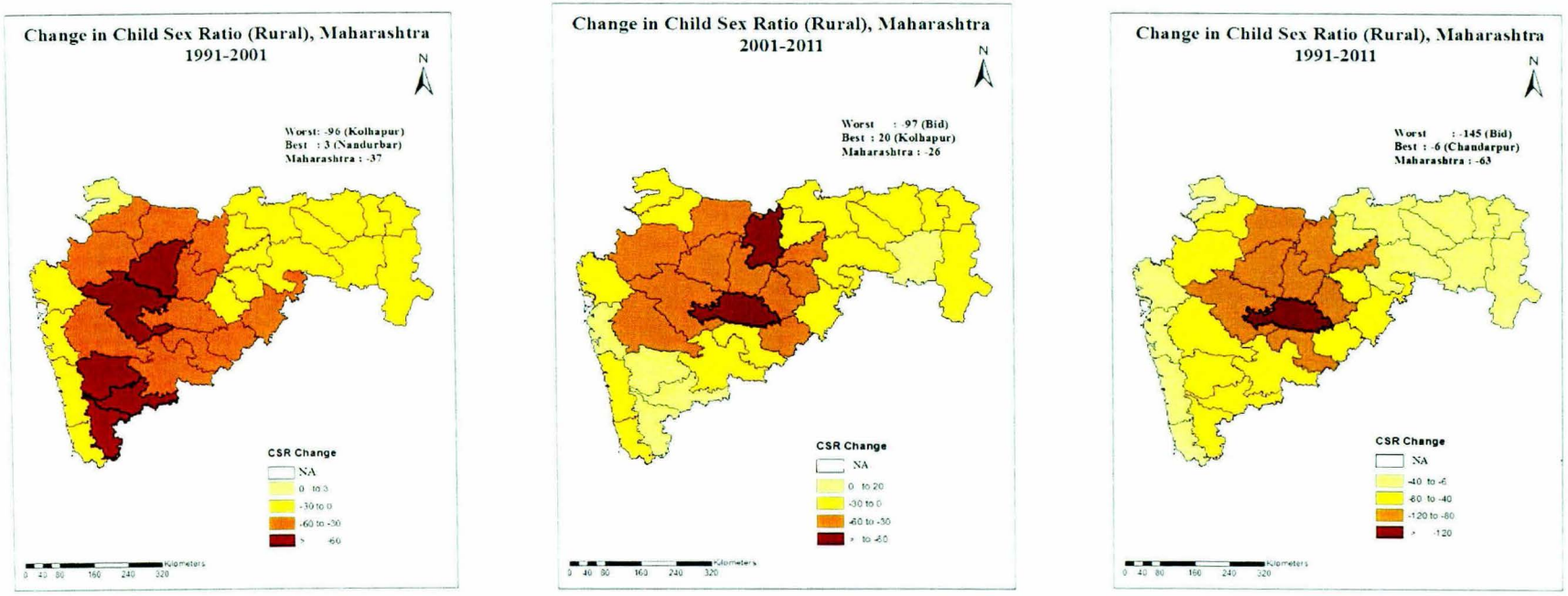
Source : Registrar General, 2013.

Table 3.8. Trends in Child Sex Ratio of Urban area from 1991, 2002 and 2011 and changes between 1991-11.

| State/Dist. | Urban CSR 1991 | Urban CSR 2001 | Urban CSR 2011 | Difference in CSR (2001-1991) | Difference in CSR (2011-2001) | Difference in CSR (2011-1991) |
|---|---|---|---|---|---|---|
| MAHARASHTRA | 934 | 908 | 899 | -26 | -9 | -35 |
| Nandurbar | 927 | 895 | 885 | -33 | -10 | -42 |
| Dhule | 927 | 875 | 872 | -52 | -3 | -55 |
| Jalgaon | 915 | 867 | 841 | -48 | -25 | -73 |
| Buldana | 934 | 887 | 864 | -47 | -22 | -69 |
| Akola | 918 | 926 | 903 | 7 | -22 | -15 |
| Washim | 941 | 943 | 878 | 2 | -65 | -63 |
| Amravati | 948 | 932 | 919 | -16 | -12 | -28 |
| Wardha | 956 | 897 | 902 | -59 | 5 | -54 |
| Nagpur | 946 | 933 | 926 | -13 | -8 | -20 |
| Bhandara | 939 | 942 | 930 | 3 | -12 | -9 |
| Gondiya | 939 | 937 | 938 | -2 | 1 | -1 |
| Gadchiroli | 941 | 938 | 917 | -3 | -21 | -24 |
| Chandrapur | 951 | 900 | 930 | -51 | 30 | -21 |
| Yavatmal | 936 | 911 | 893 | -24 | -18 | -43 |
| Nanded | 958 | 927 | 895 | -31 | -31 | -62 |
| Hingoli | 947 | 914 | 872 | -33 | -42 | -75 |
| Parbhani | 947 | 908 | 905 | -39 | -3 | -42 |
| Jalna | 945 | 909 | 909 | -36 | 1 | -36 |
| Aurangabad | 888 | 886 | 867 | -2 | -19 | -21 |
| Nashik | 941 | 904 | 890 | -36 | -14 | -50 |
| Thane | 939 | 915 | 911 | -24 | -4 | -28 |
| Mumbai (Suburban) | 933 | 923 | 913 | -11 | -10 | -20 |
| Mumbai | 933 | 922 | 914 | -11 | -8 | -19 |
| Raigarh | 933 | 914 | 913 | -19 | -1 | -20 |
| Pune | 942 | 900 | 892 | -42 | -8 | -50 |
| Ahmadnagar | 941 | 872 | 866 | -70 | -6 | -76 |
| Bid | 930 | 895 | 854 | -35 | -40 | -76 |
| Latur | 930 | 906 | 889 | -25 | -17 | -42 |
| Osmanabad | 953 | 892 | 870 | -61 | -22 | -83 |
| Solapur | 932 | 912 | 907 | -21 | -5 | -25 |
| Satara | 910 | 854 | 889 | -56 | 35 | -22 |
| Ratnagiri | 958 | 914 | 932 | -44 | 18 | -26 |
| Sindhudurg | 961 | 930 | 897 | -31 | -33 | -63 |
| Kolhapur | 911 | 831 | 865 | -80 | 34 | -46 |
| Sangli | 911 | 854 | 889 | -57 | 35 | -22 |

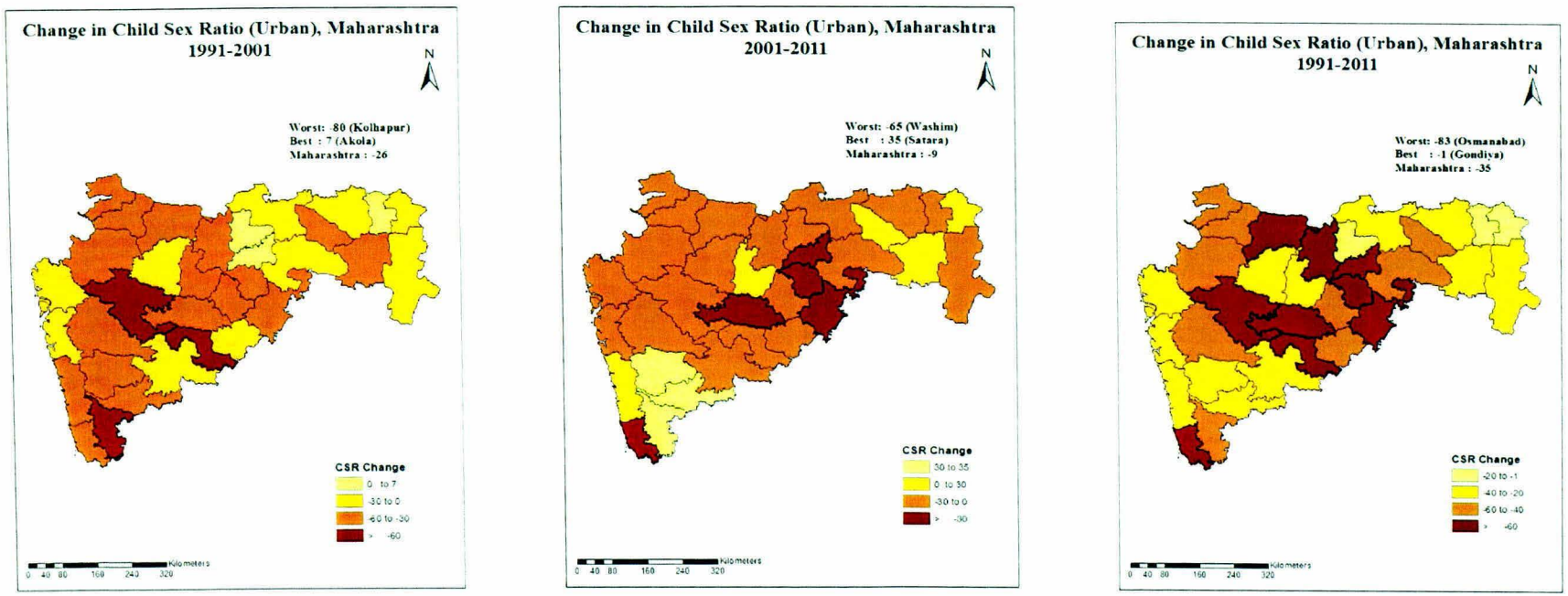
Source : Registrar General 1991, 2001, 2013.

Fig. 3.7. Changes in Child Sex Ratio in Rural areas from 1991 to 2001 to 2011.




Source : Registrar General , 1991, 2001, 2013

Fig. 3.8 Changes in Child Sex Ratio in Urban areas from 1991 to 2001 to 2011.




Source: Registrar General, 1991, 2001, 2013

**3.7 Sex Ratio at Birth:** Sex ratio at birth gives ratio of female births per thousand male births. It is the first important indicator which directly gets affected by sex selective abortions under the considerations of natural sex ratio at birth (952 girls per thousand boys). In the absence of completeness of coverage by the civil registration system, estimates of sex ratio at birth from the Sample Registration System (SRS) used here.

The SRS gives annual estimates of SRB as three –year moving averages. Interestingly by SRS data, SRB for India had been below 900 from 1991 to 2005-07 after that it has increased slowly from 901 to 905 in 2008-10 (estimates cited in Kulkarni, 2007). The SRB of Maharashtra was 913 in 1999 (1998-2000). From that point SRB showed decline until 2003-05; the SRB was 872 in 2004. Since then there have been some fluctuations and in 2008-10, it was recorded at 895.

The SRS gives estimates only at the state level, not district. However it is possible to use the child sex ratio given by censuses to indirectly estimate the SRB for a period before the census date.

Census data gives 0-6 population by sex in 2011. The number of births in the last 7 years prior to census that is from 2004 to 2011 can be estimated. Reverse Survival Method has been used to calculate male and female births separately in last seven years.

This involves the use of reverse survival methods. The number of children enumerated in the 0-6 age group is reverse survived by the appropriate survival ratio from ${}_7L_0$ (interpolated value) in order to get births which might have taken place during the last 7-year period before a census. The methodology in depth has been discussed in chapter two. Since data used are for 2011 census, we get the female and male births during 2004-2011. The formula used is:

$$\text{Male births}_{(t-7 \text{ to } t)} = \text{Male population (0-6)}_{(t)} * 700000 / {}_7L_{0\,(t)} \quad \ldots\ldots(1)$$

$$\text{Female births}_{(t-7 \text{ to } t)} = \text{Female population (0-6)}_{(t)} * 700000 / {}_7L_{0\,(t)} \quad \ldots\ldots(2)$$

$$\text{Sex ratio at Birth} = [\text{Female births}_{(t-7 \text{ to } t)} / \text{Male births}_{(t-7 \text{ to } t)}] * 1000 \quad \ldots\ldots(3)$$

The ${}_7L_0$ value are obtained from the SRS based life tables for Maharashtra for the period 2006-10, separately for male and females. The SRB thus computed refers to the 7 period prior to the census that is 2004-11. A similar procedure has been adopted for the 2001 census. The SRS based life tables for the period 1996-2000 have been adopted here for Maharashtra, by sex. However for districts, life tables are not available. Therefore the state life tables values are adjusted to the district by using the estimates of ${}_5q_0$ for each district (given by Office of Registrar General based on Brass method) and corresponding South Asian model Life table. This was possible for 2001 census since estimates of ${}_5q_0$ for districts were available.

For the 2011 census, data on children ever born and children surviving are not yet available and hence district estimates of ${}_5q_0$ based on 2011 census are not available, Hence the ratio of district ${}_5q_0$ to state ${}_5q_0$ from 2001 census estimates were applied to the ${}_7L_0$ estimate of the state for 2006-10 to get district values of ${}_7L_0$ for 2006-10.The details of methodology are shown in chapter two.

**District wise Sex Ratio at Birth for Maharashtra, 2001**

The estimated SRB of Maharashtra state for period 1994 to 2001 is 924. Kolhapur recorded the lowest SRB of 847 followed by Sangli (862) and Satara (889). All these districts from western Maharashtra are quite developed in agriculture and have large number of sugar factories and milk dairies. It is the milk and sugar belt of Maharashtra. Ahmadnagar (896) , Jalgaon(898) , and Aurangabad (906) , Bid (910) , Pune (913) and Buldhana ( 919) , Jalna (919) from central region of Maharashtra also showed quite low Sex ratio at birth. Southern districts like Osmanabad, Solapur also had SRB of 907 only. All other districts have shown quite balanced SRB (Table 3.9).

**District wise Sex Ratio at Birth for Maharashtra, 2011**

The estimated SRB for Maharashtra for 2004-2011 is 896, very close to the direct SRS estimate given as three –year moving averages in this period. The spatial pattern of SRB is almost the same as of CSR. Bid district recorded lowest SRB of 815 followed by Jalgaon (851). Districts from central Maharashtra like Hingoli, Parbhani, Aurangabad and Jalana recorded same range of SRB (Below 900). The southern border districts of

Maharashtra Solapur, Osmanabad, Kolhapur and Sangli also showed SRB below 900.Districts from Western Maharashtra like Pune, Ahmadnagar and Satara also have of SRB below 900. Gadchiroli (953) is the only district which has SRB more than 950. A very large number of districts have SRB below 900 and a few districts having SRB between 900-930 like Mumbai, Mumbai suburban, Thane, and Sindhudurg from western side of Maharashtra. Southern districts like Nanded, Yavatmal also have SRB below 930 (table 3.10).

If we compare SRB of 1994-2001 to SRB of 2004-11, we find districts from western Maharashtra have shown some increase in SRB. But even after the increase, the SRB of these districts are well below normal, the good thing is it has increased from earlier. But the thing which needs attention is that the central belt from northern districts from Jalgaon to southern districts Solapur has shown steep decline in SRBs from 2001 to 2011. All other districts of Maharashtra showed decrease in SRB including large decrease in Mumbai and Mumbai Suburban districts.

Table. 3.9. Estimated Sex Ratio at Birth of Maharashtra and its districts, 2001.

| no. | State/dist. | Male births(1994-01) | Female births(1994-01) | SRB by Indian (FB/MB*1000) convention | SRB by international (MB/FB*100) Convention |
|---|---|---|---|---|---|
| | MAHARASHTRA | 7531904 | 6959135 | 924 | 108 |
| 1 | Nandurbar | 123718 | 122533 | 990 | 101 |
| 2 | Dhule | 142370 | 131336 | 922 | 108 |
| 3 | Jalgaon | 294630 | 264636 | 898 | 111 |
| 4 | Buldana | 188293 | 173054 | 919 | 109 |
| 5 | Akola | 128118 | 120759 | 943 | 106 |
| 6 | Washim | 88846 | 82576 | 929 | 108 |
| 7 | Amravati | 198381 | 188431 | 950 | 105 |
| 8 | Wardha | 85600 | 80255 | 938 | 107 |
| 9 | Nagpur | 288561 | 274479 | 951 | 105 |
| 10 | Bhandara | 85766 | 82447 | 961 | 104 |
| 11 | Gondiya | 96184 | 92277 | 959 | 104 |
| 12 | Gadchiroli | 86849 | 83894 | 966 | 104 |
| 13 | Chandrapur | 157102 | 147951 | 942 | 106 |
| 14 | Yavatmal | 205706 | 193777 | 942 | 106 |
| 15 | Nanded | 264398 | 248483 | 940 | 106 |
| 16 | Hingoli | 92229 | 86590 | 939 | 107 |
| 17 | Parbhani | 138609 | 129807 | 936 | 107 |
| 18 | Jalna | 146075 | 134226 | 919 | 109 |
| 19 | Aurangabad | 261607 | 236975 | 906 | 110 |
| 20 | Nashik | 434811 | 405713 | 933 | 107 |
| 21 | Thane | 618029 | 581977 | 942 | 106 |
| 22 | Mumbai (Suburban) | 556148 | 518820 | 933 | 107 |
| 23 | Mumbai | 184807 | 172695 | 934 | 107 |
| 24 | Raigarh | 170192 | 161095 | 947 | 106 |
| 25 | Pune | 525730 | 480016 | 913 | 110 |
| 26 | Ahmadnagar | 328039 | 293861 | 896 | 112 |
| 27 | Bid | 184754 | 168155 | 910 | 110 |
| 28 | Latur | 179583 | 167548 | 933 | 107 |
| 29 | Osmanabad | 123993 | 112435 | 907 | 110 |
| 30 | Solapur | 314548 | 285351 | 907 | 110 |
| 31 | Satara | 202730 | 180152 | 889 | 113 |
| 32 | Ratnagiri | 126118 | 120999 | 959 | 104 |
| 33 | Sindhudurg | 56225 | 53822 | 957 | 104 |
| 34 | Kolhapur | 254620 | 215732 | 847 | 118 |
| 35 | Sangli | 190493 | 164247 | 862 | 116 |

Source: Male and female births are estimated using reverse survival method by the author.

Table 3.10. Estimated Sex Ratio at Birth in Maharashtra and its districts, 2011.

| no. | State/dist. | Male births(2004-11) | Female births(2004-11) | SRB by Indian (FB/MB*1000) convention | SRB by international (MB/FB*100) Convention |
|---|---|---|---|---|---|
| | MAHARASHTRA | 7274644 | 6520885 | 896 | 112 |
| 1 | Nandurbar | 130985 | 123448 | 942 | 106 |
| 2 | Dhule | 150555 | 136364 | 906 | 110 |
| 3 | Jalgaon | 298649 | 254158 | 851 | 118 |
| 4 | Buldana | 185540 | 158971 | 857 | 117 |
| 5 | Akola | 113663 | 103743 | 913 | 110 |
| 6 | Washim | 85158 | 73687 | 865 | 116 |
| 7 | Amravati | 170397 | 159239 | 935 | 107 |
| 8 | Wardha | 69971 | 64300 | 919 | 109 |
| 9 | Nagpur | 269485 | 250992 | 931 | 107 |
| 10 | Bhandara | 69366 | 65605 | 946 | 106 |
| 11 | Gondiya | 77934 | 73851 | 948 | 106 |
| 12 | Gadchiroli | 66806 | 63668 | 953 | 105 |
| 13 | Chandrapur | 127295 | 120320 | 945 | 106 |
| 14 | Yavatmal | 181883 | 167821 | 923 | 108 |
| 15 | Nanded | 252661 | 230518 | 912 | 110 |
| 16 | Hingoli | 91983 | 81425 | 885 | 113 |
| 17 | Parbhani | 141539 | 125773 | 889 | 113 |
| 18 | Jalna | 160501 | 140906 | 878 | 114 |
| 19 | Aurangabad | 297380 | 257043 | 864 | 116 |
| 20 | Nashik | 454799 | 406643 | 894 | 112 |
| 21 | Thane | 704511 | 652013 | 925 | 108 |
| 22 | Mumbai (Suburban) | 497673 | 454777 | 914 | 109 |
| 23 | Mumbai | 146076 | 134110 | 918 | 109 |
| 24 | Raigarh | 159747 | 149148 | 934 | 107 |
| 25 | Pune | 592735 | 524763 | 885 | 113 |
| 26 | Ahmadnagar | 308563 | 263756 | 855 | 117 |
| 27 | Bid | 199649 | 162730 | 815 | 123 |
| 28 | Latur | 173958 | 155841 | 896 | 112 |
| 29 | Osmanabad | 114458 | 99793 | 872 | 115 |
| 30 | Solapur | 293213 | 260187 | 887 | 113 |
| 31 | Satara | 169633 | 152184 | 897 | 111 |
| 32 | Ratnagiri | 81898 | 76474 | 934 | 107 |
| 33 | Sindhudurg | 37567 | 34796 | 926 | 108 |
| 34 | Kolhapur | 223796 | 193149 | 863 | 116 |
| 35 | Sangli | 166056 | 144345 | 869 | 115 |

Source: Male and female births are estimated using reverse survival method by the author.

### 3.8 Development Indicators of Districts

Many researchers have shown that socio economic developmental indicators of society may have some impact on CSR. Socioeconomic process of any district can contribute to its demographic indicators. It is difficult to establish any particular relationship between population and development. But it is important to examine the changes happened in transition of demographic indicators in the context of the developmental process. This section tries to see the possible relationships of developmental indicators with the CSR in Maharashtra.

The Census of India 2011 provides data on level of literacy, level of urbanization, share of cultivators, and share of ST population in its Primary Census Abstract (Registrar General, 2013). The Economic Survey of Maharashtra 2011-12 conducted by Directorate of Economics and Statistics, Planning Department, Government of Maharashtra gives data on per capita net domestic product a key economic indicator in development of district. As literature suggests education has an effect on fertility decisions. Educated people have awareness and access to technology. Level of urbanization gives an idea about proportion of people who have access to the good health infrastructure, information and communication. These facilities have influence on their family decisions. Share of cultivators can give an idea about agricultural families. Literature showed the high son preference in agricultural families. So it may affect the scenario of CSR. Share of ST is a social indicator of society. Tribal population is more gender neutral than any other social groups in society so tribes would have child sex ratios nearer natural than any other social groups. Per capita net domestic product is aneconomic an indicator which measures an economic capacity to access the services.

#### Literacy Level

The Recently released Census 2011 data showed literacy level of 82.3 % for of ages 7+ in Maharashtra. Mumbai and Mumbai Suburban area showed highest literacy level of about 90%. Nandurbar district is at the other extreme (64.4%). There is not much variation in

the level of literacy in other districts of Maharashtra. Many districts have literacy level above national average (Table 3.11).

**Level of Urbanization**

Maharashtra has 46 % level of urbanization. Mumbai and Mumbai Suburban are fully urbanized districts followed by Thane (78%), Nagpur (68%) and Pune (61%). Aurangabad and Nashik have around 43% urbanization. Raigarh (38%) (Adjoining Mumbai) , Kolhapur and Solapur have 32% urbanization and some central districts of Maharashtra like Akola, Parbhani have also shown above 30 % level of Urbanization. Gadchiroli (11%), Sindhudurg (13%) and Hingoli(15%) districts are in very low range of urbanization (Table 3.11).

**Share of Cultivators**

The Census 2011 data revealed 24% of Maharashtra's workers are cultivators. Bid district has the highest number of cultivators (48%) out of its total workers, followed by Jalana and Gadchiroli (46% each). Hingoli(44%), Satara(44%) and Sangli (42%) districts also have significant share of cultivators. Share of cultivators is high and distributed fairly uniformly significant manner throughout the state (Table 3.11).

**Share of ST Population**

The Tribal population is concentrated in eastern less developed part of Maharashtra and along the northern borders of the state. Nandurbar has high ST population (70%) followed by Gadchiroli (39%) and Dhule (32%). Chandrapur , Yavatmal, Gondiya, Jalgaon and Nashik also have large share of ST population. On the other hand Sangli (0.6%) and rest of the western Maharashtra and central Maharashtra showed very low proportion of ST population except Thane (14%) and Raigarh (12%) (Table 3.11).

**Per Capita Net Domestic Product**

PCNDT is a good indicator of the Economy. Maharashtra is one of the progressive states in terms of economic development. The per capita net domestic product in the state (Rs.

87,686) is well above the national averages. As expected Mumbai (being the financial capital of India) and Mumbai suburban districts have the highest per capita net domestic product followed by Pune and Thane. Districts like Nagpur, Aurangabad, Nashik , Latur and Kolhapur have also shown high range of PCNDP( above Rs. 80,000). Districts from North central and Central Maharashtra like Buldhana, Bid, Osmanabad, Nanded, Hingoli are in the medium to low range of PCNDP (Rs. 40,000 to 50,000). Gadchiroli has the lowest PCNDP (Rs. 43058). There is huge inequality found by region. Western Maharashtra had higher levels of PCNDP than rest of the Maharashtra. There is huge difference in the levels of economies across districts of State (Table 3.11).

Table 3.11. Sex ratio at Birth and Child sex ratio with development Indicators. 2011.

| No | State/district | SRB | CSR | Literacy Level | Level of Urbanization | Share of ST pop | Share of Cultivators | Per Capita Net Domestic Product |
|---|---|---|---|---|---|---|---|---|
| 0 | MAHARASHTRA | 896 | 894 | 82.3 | 45.8 | 9.4 | 23.9 | 87686 |
| 1 | Nandurbar | 942 | 944 | 64.3 | 17.4 | 69.3 | 32.2 | 52923 |
| 2 | Dhule | 906 | 898 | 72.8 | 28 | 31.6 | 28.1 | 58575 |
| 3 | Jalgaon | 851 | 842 | 78.2 | 31.8 | 14.3 | 22.4 | 68900 |
| 4 | Buldana | 857 | 855 | 83.4 | 21.1 | 4.8 | 32.7 | 45699 |
| 5 | Akola | 913 | 912 | 88 | 39.5 | 5.5 | 18.5 | 58627 |
| 6 | Washim | 865 | 863 | 83.2 | 17.5 | 6.7 | 31.7 | 52075 |
| 7 | Amravati | 935 | 935 | 87.3 | 35.8 | 14 | 19 | 63270 |
| 8 | Wardha | 919 | 919 | 86.9 | 32.3 | 11.5 | 25 | 61391 |
| 9 | Nagpur | 931 | 931 | 88.3 | 68 | 9.4 | 10.6 | 96458 |
| 10 | Bhandara | 946 | 950 | 83.7 | 19.5 | 7.4 | 24.7 | 57094 |
| 11 | Gondiya | 948 | 956 | 84.9 | 17.1 | 16.2 | 31.7 | 50042 |
| 12 | Gadchiroli | 953 | 961 | 74.3 | 11 | 38.7 | 46 | 43058 |
| 13 | Chandrapur | 945 | 953 | 80 | 35.3 | 17.7 | 23.3 | 67641 |
| 14 | Yavatmal | 923 | 922 | 82.8 | 21.4 | 18.5 | 27.4 | 63469 |
| 15 | Nanded | 912 | 910 | 75.4 | 27.3 | 8.4 | 31.8 | 44978 |
| 16 | Hingoli | 885 | 882 | 78.1 | 15.1 | 9.5 | 43.7 | 49470 |
| 17 | Parbhani | 889 | 884 | 73.3 | 30.9 | 2.2 | 36.4 | 50716 |
| 18 | Jalna | 878 | 870 | 71.5 | 19.2 | 2.2 | 46.1 | 50262 |
| 19 | Aurangabad | 864 | 858 | 79 | 43.8 | 3.9 | 32.7 | 84295 |
| 20 | Nashik | 894 | 890 | 82.3 | 42.8 | 25.6 | 32.1 | 84982 |
| 21 | Thane | 925 | 924 | 84.5 | 77 | 13.9 | 5.5 | 125562 |
| 22 | Mumbai Suburban | 914 | 913 | 89.9 | 100 | 1.1 | 0.2 | 141138 |
| 23 | Mumbai | 918 | 914 | 89.2 | 100 | 0.8 | 0.2 | 141138 |
| 24 | Raigarh | 934 | 935 | 83.1 | 37.8 | 11.6 | 16 | 96468 |
| 25 | Pune | 885 | 883 | 86.1 | 61.2 | 3.7 | 18.1 | 127176 |
| 26 | Ahmadnagar | 855 | 852 | 79 | 20 | 8.3 | 44.7 | 71054 |
| 27 | Bid | 815 | 807 | 76.9 | 19.7 | 1.3 | 48.2 | 52177 |
| 28 | Latur | 896 | 889 | 77.2 | 25.4 | 2.3 | 32.2 | 81557 |
| 29 | Osmanabad | 872 | 867 | 78.4 | 16.8 | 2.2 | 41.4 | 48887 |
| 30 | Solapur | 887 | 883 | 77 | 31.8 | 1.8 | 34.8 | 70465 |
| 31 | Satara | 897 | 895 | 82.8 | 19.2 | 1 | 43.5 | 67134 |
| 32 | Ratnagiri | 934 | 936 | 82.1 | 17.2 | 1.3 | 33.8 | 66921 |
| 33 | Sindhudurg | 926 | 922 | 85.5 | 12.9 | 0.8 | 33.9 | 69552 |
| 34 | Kolhapur | 863 | 863 | 81.5 | 31.9 | 0.8 | 35.6 | 84095 |
| 35 | Sangli | 869 | 867 | 81.4 | 25.5 | 0.6 | 42.2 | 71196 |

Source : Census of India 2011. Economic Survey of Maharashtra 2011-12; Department of Health and Family Welfare, GOM., 2011.

## Association between CSR and Developmental Indicators

In order to see whether the factors mentioned above are associated with the CSR of the SRB, correlation coefficients between these and CSR and SRB are obtained. For this purpose, out of 35 districts of Maharashtra, Mumbai and Mumbai Suburban are omitted since these are entirely urban and have special characteristics. The analysis is based on remaining 33 districts (Table 3.12).

Table 3.12. Correlation between SRB, CSR and development indicators, districts of Maharashtra, 2011.

| Variables | SRB | CSR | % literate | % urban | %ST | Share of Cultivators | Per Capita Net domestic Product |
|---|---|---|---|---|---|---|---|
| SRB | 1 | .997*** | .157 | .083 | .453** | -.449*** | .036 |
| CSR | .997*** | 1 | .173 | .071 | .452*** | -.434** | .026 |
| % literate | .157 | .173 | 1 | .399** | -.477*** | -.517*** | .409** |
| % urban | .083 | .071 | .399** | 1 | -.075 | -.767*** | .824*** |
| %ST | .453*** | .452*** | -.477*** | -.075 | 1 | -.102 | -.151 |
| Share of Cultivators | -.449*** | -.434** | -.517*** | -.767*** | -.102 | 1 | -.604*** |
| Per Capita Net domestic Product | .036 | .026 | .409** | .824*** | -.151 | -.604*** | 1 |

Source: Census of India 2011, Economic Survey of Maharashtra 2011-12; Department of Health and Family Welfare, GOM., 2011.

***,** and * : Correlation coefficient is significant at the 1%, 5%, 10% level respectively. (2- tailed)

Note: N=33 as Mumbai and Mumbai and Mumbai suburban districts are excluded.

It may be seen that Share of ST population has highly significant positive relationship (0.452***) with CSR (Table 3.12). This echoes the observation that STs have a balanced sex ratio in India, and regions with high ST concentration have generally shown fairly balances sex composition. Share of cultivators has shown highly significant negative

association with CSR (-0.434**). Though Pearson's correlation coefficient is not so high but still our argument of high son preference in agricultural families gets support. Other development indicators like level of urbanization, Literacy level and Per Capita Net Domestic Product have not shown any such significant association with CSR.

**Multiple Linear Regression Analysis**

By correlation analysis we got to know the association between CSR and developmental indicators. Now it is important to see net effect of each independent variable on CSR to get a clear understanding of roles of each predictor variable and their contribution (for variation in CSR).for this study has doe the regression analysis.

Table 3.13 Regression of Child Sex Ratio on selected development indicators, districts of Maharashtra, 2011.

| Dependent Variable | Independent Variables | Regression Coefficient | t | P |
|---|---|---|---|---|
| CSR | % of Literate pop | 2.04 | 1.417 | .167 |
| | % of Urban pop | -1.11** | -2.065 | .048 |
| | % of ST pop | 1.35*** | 2.745 | .010 |
| | Share of Cultivators | -2.09** | -2.213 | 0.035 |
| | Constant | 817.08 | | |

***,** and * : significant at the 1%, 5%, 10% level respectively. (2- tailed)

| R=.703 | $R^2$ =.495 | Adj $R^2$ =.423 | n = 33 |
|---|---|---|---|

Note: N=33 as Mumbai and Mumbai and Mumbai suburban districts excluded.

Source: Census of India 2011, Economic Survey of Maharashtra 2011-12; Department of Health and Family Welfare, GOM, 2011.

Of the inter-district variation in CSR, 42% (adjusted R square = .423) is explained by developmental indicators like Share of ST, Level of urbanization, literacy level and share of cultivators (Table 3.13). We found level of urbanization has significant negative

impact on CSR (-1.11**). One unit increase in urban population can decrease CSR by one unit. A plausible explanation is that the access to sex selection means increases with urbanization. Further, the share of cultivators has shown significant negative impact on CSR (-.2.09**) at 5 % level of significance. One unit increase in share of cultivators causes two units decrease in CSR. The Cultivators are mainly engaged in agriculture so they strongly want a son to carry forward the farming work and help them physically in the field. Cultivators think their land as property and they do't want that property to go out of household in the form of dowry. On the other hand the share of ST population has shown positive impact on CSR. As share of ST increases by one unit then CSR will increase by 1.3 units as STs are more gender neutral. So we can find significant number if girls over boys unlike other communities. The literacy level has not shown any significant impact on CSR. The reason might be son preference is universal in people with all levels of education, irrespective of their literacy level.

### 3.9 Concluding Remarks

As data reveals, majority of districts of Maharashtra (18 districts out of 35 districts) have CSR lower than 900. Some districts from Western and Central part of the state like Bid, Buldhana, and Washim showed huge declinations in CSR from Census 2001. Districts from western Maharashtra like Kolhapur and Sangli districts which had worst scenario of CSR in 2001 (Below 850) has shown reverse trend. But the figures are still low in this region. Analysis of SRB has been carried out in this study has shown districts from North central and central part with the worst scenario of SRB. The districts from Western Maharashtra have shown some increase in SRB from 1994-2001 to 2004- 2011 period. But still figures are well below the normal level of SRB. When we did some statistical analysis to look at an impact of developmental indicators of districts on CSR, we found the level of urbanization and share of cultivators have shown significant negative impact on CSR. As level of urbanization increases accessibility to means of sex selection and inflation levels in cities may influence the fertility decisions of couple in declining fertility. Moreover with increasing costs of children, many people may prefer to invest on

Son rather than daughter. As mentioned earlier, cultivators' families prefer son to help in agriculture. These might be the reasons of huge decline in CSR in both in rural and urban areas. Share of ST population have shown significant positive impact on CSR as tribal populations are perceived to be gender neutral communities. Literacy level has not shown any significant impact on CSR. Only less developed and tribal districts of Maharashtra had normal child sex ratio trends but when we analyze developed and semi developed districts the scenario has worsened over the time. The figures have gone up to very low level which might get long time and efforts to get back to the normal range of CSR, in the meanwhile the society has to go through the implications of imbalanced CSR trends.

Chapter 4

# District wise Estimation of Total Missing Girls

# Chapter 4

# District wise Estimation of Total Missing Girls

## 4.1 Introduction

In the previous chapter, it has been noted that the Child Sex Ratio in Maharashtra shows a huge imbalance and further that this is severe in many districts. This brings in the issue of "Missing Girls". The deficit can be on two accounts: 1. Sex Ratio at Birth (SRB) can be lower than normal, due to Sex Selective Abortions 2. Excess Female Child Mortality due to discrimination against girls. Sex selective under reporting can also create imbalance in Child sex ratios but with improvement in quality of age sex reporting in recent census enumerations, this issue has become less important.

It is important to estimate total missing girls because it is one of the important indicators of imbalance in society and society's bias for boys. Many couples in society do not want girls because of various socio-cultural reasons. They are taking advantage of widely spread and cheap ultrasound technology. The Acts and laws have practical limitations in this field. Moreover there are many hidden ways to continue this practice and many difficulties to prove this guilty act. So it becomes important to estimate the number of sex selective abortions (SSA).This has to be doe indirectly as first of all nobody will register this act. Many abortions might be taking place by untrained personnel and in unsafe conditions. Moreover, it is important to see area wise distribution at least up to district level to know the prevalence and need for administration for area wise intervention programs to stop this act. Many times socio economic conditions differ across districts so it is important to study district wise estimates of the volume of sex selective abortions.

Though India legalized abortion in 1971, ultrasound technology did not become widely available until the mid-1980s, after which sex ratios at birth began to fall significantly below expected norms. Recognizing this trend, the Indian government passed the Pre-Conception and Pre-Natal Diagnostic Techniques (PNDT) (Prohibition of Sex Selection)

Act in 1994, outlawing prenatal sex determination on January 1, 1996. However, the child sex ratio has continued to decline, leading many to believe that the ban has been practically ineffective due to inadequate enforcement and insufficient punitive measures. (Guilmato 2007). Even though stricter measures are being taken to enforce the ban nationwide, the Indian Planning Commission recently acknowledged that the government has failed to implement the ban. The Commission is now looking at alternate policy options, including giving incentives to families and health workers for the safe delivery of babies and adoption of female fetuses (Dhar 2011). With these background issues this chapter aims to focus on estimation of sex selective abortions, their regional variation to identify the prevalence areas.

This Chapter has attempted estimation of total missing girls in districts of Maharashtra from the data of Census 2001 and 2011. Indirect estimations of Sex selective abortions and excess female child mortality are obtained to get total missing girls resulted from both (SSA and Excess Female Child Mortality). The detailed methodology has been described in chapter two earlier. Data of Census of India, United Nations South Asian Model Life tables and child mortality estimates from census has been used.

## 4.2 Sex Selective Abortions and resulted missing girls estimated from Census data

### Estimates from 2001 Census (for the period 1994-2001)

The 2001 census showed a child sex ratio of 913 in Maharashtra. There were 6524694 girls and 7146432 boys of ages 0-6 on 1st March 2001. By reverse surviving girls and boys, we get 6959135 female births and 7531904 male births during the seven year period before census date i.e. 1994-2001. We estimated SRB from those births and it was 924 for the period 1994-2001. If the SRB was normal (952 female births per 1000 male births) then for 7531904 male births there should be 7173242 (=7531904*952/1000) female births. This implies that the number of female births during 1994-2001 was short by 214107 (=7173242-6959135) of the expected. This gives an estimate of the number of sex selective abortions during 1994-2001(Table 4.1).

Maharashtra had 214107 Sex selective abortions and had these been born there would have been an additional 200741 girls would have been alive in 2001. Note that the

number of missing girls in 2001 is less than the number of sex –selective abortions during 1994-2001 since some would not have survived to 2001. The Western belt of Maharashtra was prominent for sex selective abortions. Kolhapur district recorded the highest number of abortions (26763) and missing girls (25456) in Maharashtra. Pune district had 20680 abortions and 19795 girls missed their lives because of abortions. . Ahmadnagar recorded 18558 numbers of SSAs and 17477 missing girls due to sex selective abortions. Again Sangli from Western Maharashtra had SSA 17175 and has missing girls 16426 followed by Jalgaon (around 14847 missing girls due to SSAs). Solapur followed by Satara and Aurangabad district also had huge number of SSAs and resulting missing girls (in the range of 12000 to 13500). Mumbai suburban area (10278) had much higher SSAs than Mumbai (3125). Nagpur district had very low number of SSAs (341).

On the other hand, child sex ratios in districts like Nandurbar, Ratnagiri, Sindhudurg, Gondiya, Bhandara and Gadchiroli are quite normal indicating that Sex Selective abortions are not common in these districts. Central South part of Maharashtra state (Bid, Latur, and Osmanabad) had SSAs in the range 3000 to 7500. Rest of the districts also recorded SSAs from 1000 to 4500 so as missing girls (Fig. 4.1).

**Estimated from 2011 Census (For the period 2004-11)**

Following a similar approach, by reverse surviving the number of girls and boys of ages 0-6 enumerated in the 2011 Census, the estimated number of sex selective abortions in the Maharashtra during 2004-11 is 407347 and 392995 missing girls in 2011. Pune district had highest, 39,256 SSAs and 39256 girls missed their lives (Table 4.2). Ahmednagar district had 29203 SSAs followed by Jalgaon. Nashik, Aurangabad and Bid also had SSAs individually close to that figure. Kolhapur district had 23,358 abortions from year 2004 to 2011. Solapur and Mumbai Suburban district also had close to 20,000 SSAs (Fig. 4.2).

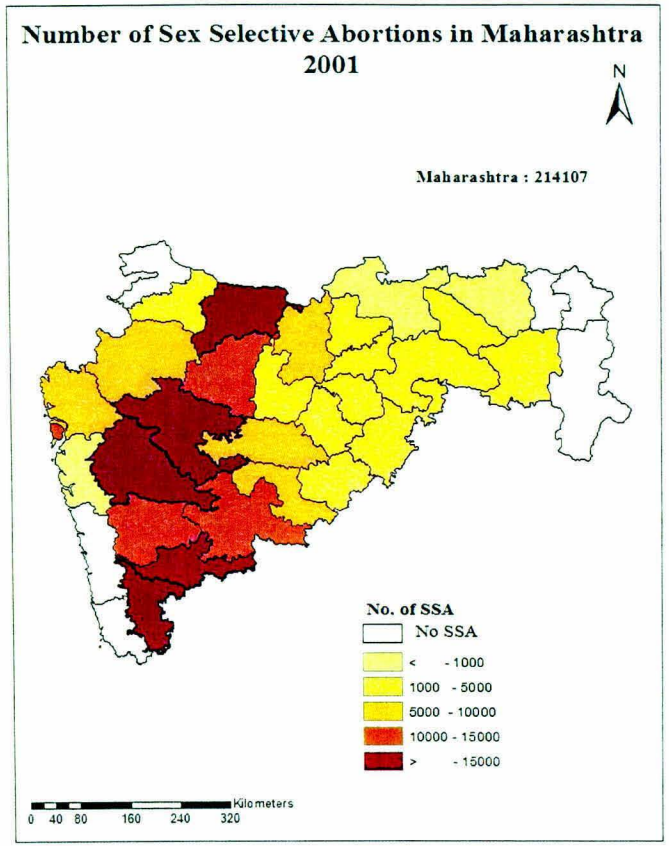
Some districts that had shown no evidence of sex selection in census 2001, have now shown sex selective abortions though the volume is not large (200 to 1500). The extent of sex selective abortions has increased tremendously over the decade. Further, while

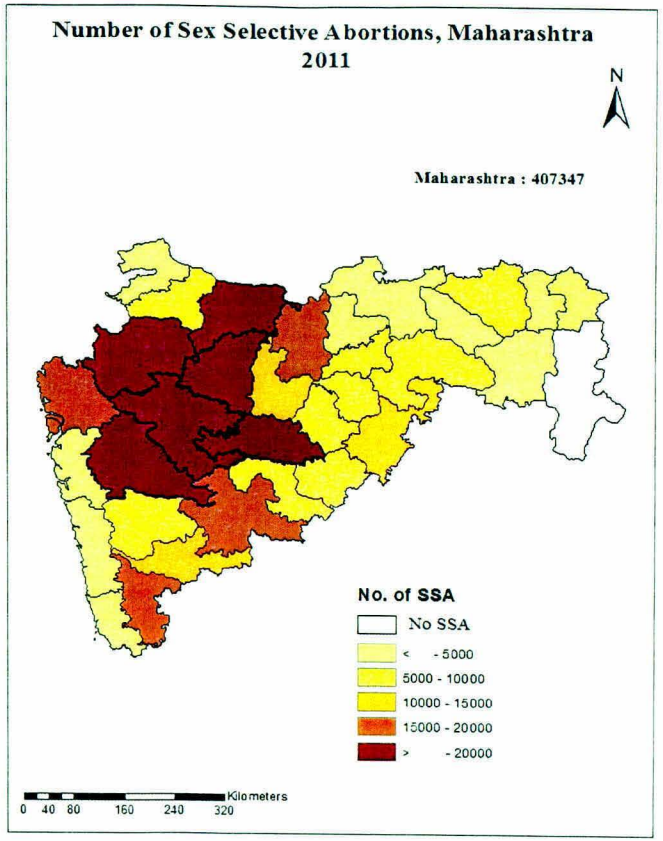
previously sex selective abortions were highly prevalent only in Western Maharashtra, now rest of the Maharashtra also seems to be adopting the behavior and technological use to abort female fetuses from western region of state.

Now the situation in "Marathwada divison" of Maharashtra (Aurangabad, Bid, Hingoli, Jalana, Latur, Nanded, and Osmanabad, Parbhani districts) has became worse where Sex selective abortions increased and child sex ratio decreased sharply (Fig. 4.1).

Earlier, the incidence of Sex Selective Abortions showed East-West divide in Maharashtra. Now the western part and north central and central part of Maharashtra are showing higher number of abortions which needs government's attention. The Eastern part of Maharashtra has shown lower SSAs may be due to high number of ST population. The situation in the Central part and North central part has worsened than western part which had the highest number of SSAs in 1991 to 2001 decade.

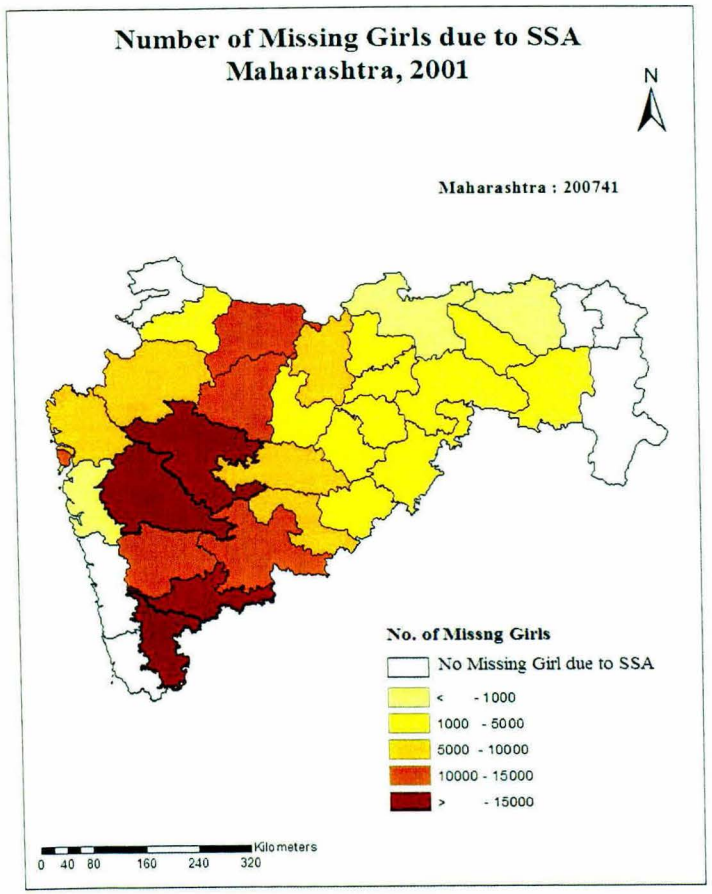
Figure. 4.1 Number of Sex Selective Abortions in Maharashtra, 2001 and 2011 (for the periods 1994-2001 and 2004-11)

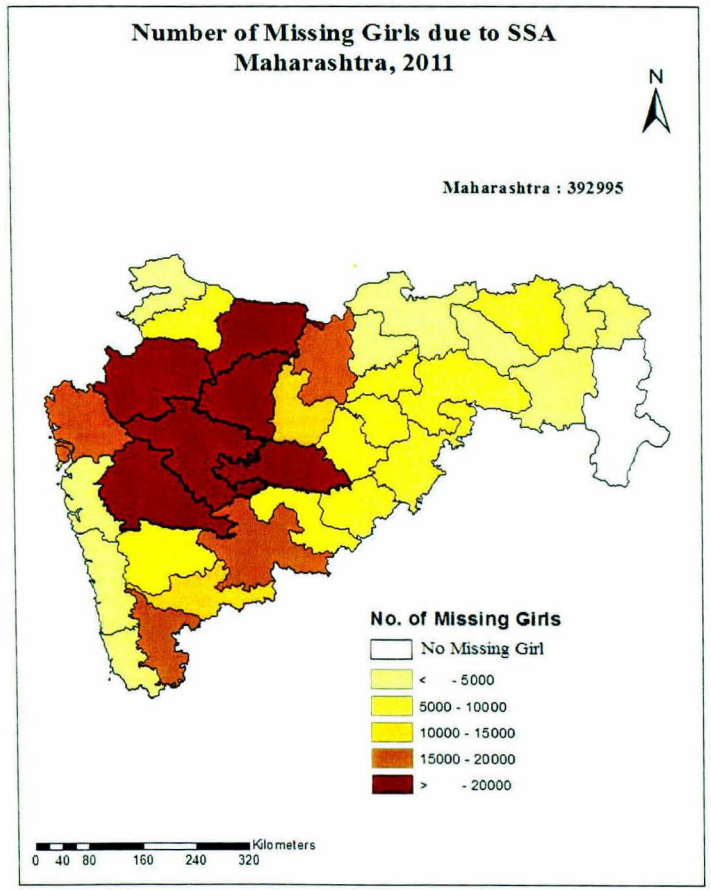



Source: Estimated by Author

Figure. 4.2 Number of missing girls due to Sex Selective Abortions in Maharashtra, 2001 and 2011.




Source: Estimated by Author

Table 4.1. Computation of Sex Selective Abortions and Missing girls due to SSA in Maharashtra and Districts, 2001.

| | State/Dist | Male pop(0-6) | $e_0^0$ (males) | $_7L_0$ (males) | Male births (94-01) | Female pop (0-6) | $e_0^0$ (females) | $_7L_0$ (females) | Female births (94-01) | Expected female births | Sex Selective Abortions (SSA) | Missing Girls due to SSA= |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maharashtra | 7146432 | 70.52 | 664175 | 7531904 | 6524694 | 70.59 | 656301 | 6959135 | 7173242 | 214107 | 200741 |
| 1 | Nandurbar | 117386 | 70.52 | 664175 | 123718 | 112827 | 67.32 | 644553 | 122533 | 117826 | * | * |
| 2 | Dhule | 133861 | 68.85 | 658166 | 142370 | 121370 | 67.95 | 646883 | 131336 | 135590 | 4254 | 3931 |
| 3 | Jalgaon | 279551 | 70.52 | 664175 | 294630 | 246117 | 69.24 | 651016 | 264636 | 280600 | 15964 | 14847 |
| 4 | Buldana | 178332 | 70.17 | 662969 | 188293 | 161962 | 70.25 | 655133 | 173054 | 179327 | 6273 | 5871 |
| 5 | Akola | 122004 | 71.22 | 666593 | 128118 | 113831 | 71.63 | 659842 | 120759 | 122018 | 1259 | 1187 |
| 6 | Washim | 83688 | 69.17 | 659364 | 88846 | 76798 | 69.24 | 651016 | 82576 | 84615 | 2038 | 1896 |
| 7 | Amravati | 184329 | 66.83 | 650417 | 198381 | 173505 | 67.32 | 644553 | 188431 | 188934 | 504 | 464 |
| 8 | Wardha | 80704 | 69.34 | 659964 | 85600 | 74908 | 69.75 | 653363 | 80255 | 81524 | 1269 | 1184 |
| 9 | Nagpur | 270823 | 68.53 | 656970 | 288561 | 255027 | 68.91 | 650391 | 274479 | 274820 | 341 | 317 |
| 10 | Bhandara | 78749 | 64.95 | 642730 | 85766 | 75302 | 65.95 | 639334 | 82447 | 81682 | * | * |
| 11 | Gondiya | 87427 | 63.44 | 636271 | 96184 | 83764 | 64.96 | 635421 | 92277 | 91604 | * | * |
| 12 | Gadchiroli | 78724 | 63.03 | 634512 | 86849 | 76020 | 64.74 | 634304 | 83894 | 82713 | * | * |
| 13 | Chandrapur | 144117 | 64.81 | 642143 | 157102 | 135373 | 66.25 | 640492 | 147951 | 149621 | 1670 | 1528 |
| 14 | Yavatmal | 191135 | 66.83 | 650417 | 205706 | 178267 | 67.17 | 643970 | 193777 | 195910 | 2133 | 1962 |
| 15 | Nanded | 247468 | 68.05 | 655177 | 264398 | 229835 | 68.11 | 647467 | 248483 | 251808 | 3325 | 3075 |
| 16 | Hingoli | 86717 | 68.85 | 658166 | 92229 | 80381 | 68.75 | 649806 | 86590 | 87837 | 1247 | 1158 |
| 17 | Parbhani | 131276 | 70.17 | 662969 | 138609 | 121159 | 69.75 | 653363 | 129807 | 132008 | 2201 | 2054 |
| 18 | Jalna | 137345 | 68.85 | 658166 | 146075 | 124041 | 67.95 | 646883 | 134226 | 139119 | 4893 | 4521 |

| | State/Dist. | Male pop(0-6) | $e_0^0$ (males) | $_7L_0$ (males) | Male births (94-01) | Female pop (0-6) | $e_0^0$ (females) | $_7L_0$ (females) | Female births (94-01) | Expected female births | Sex Selective Abortions (SSA) | Missing Girls due to SSA= |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Aurangabad | 247542 | 70.00 | 662365 | 261607 | 220392 | 69.24 | 651016 | 236975 | 249149 | 12175 | 11323 |
| 20 | Nashik | 411061 | 69.84 | 661765 | 434811 | 378337 | 69.58 | 652767 | 405713 | 414106 | 8393 | 7827 |
| 21 | Thane | 592830 | 72.71 | 671458 | 618029 | 552066 | 72.91 | 664024 | 581977 | 588599 | 6623 | 6283 |
| 22 | Mumbai (Suburban) | 532988 | 72.52 | 670849 | 556148 | 491712 | 72.72 | 663425 | 518820 | 529665 | 10845 | 10278 |
| 23 | Mumbai | 176789 | 72.14 | 669631 | 184807 | 162934 | 71.81 | 660436 | 172695 | 176007 | 3312 | 3125 |
| 24 | Raigarh | 162365 | 71.59 | 667807 | 170192 | 152402 | 72.35 | 662228 | 161095 | 162088 | 993 | 939 |
| 25 | Pune | 509367 | 74.98 | 678213 | 525730 | 459484 | 74.87 | 670059 | 480016 | 500696 | 20680 | 19795 |
| 26 | Ahmadnagar | 312953 | 71.59 | 667807 | 328039 | 276753 | 71.45 | 659248 | 293861 | 312418 | 18558 | 17477 |
| 27 | Bid | 177060 | 72.52 | 670849 | 184754 | 158223 | 71.28 | 658653 | 168155 | 175956 | 7801 | 7340 |
| 28 | Latur | 170392 | 70.52 | 664175 | 179583 | 156385 | 69.75 | 653363 | 167548 | 171031 | 3483 | 3251 |
| 29 | Osmanabad | 117861 | 70.87 | 665381 | 123993 | 105322 | 70.42 | 655717 | 112435 | 118089 | 5654 | 5296 |
| 30 | Solapur | 300628 | 71.95 | 669022 | 314548 | 268981 | 71.63 | 659842 | 285351 | 299570 | 14219 | 13403 |
| 31 | Satara | 196241 | 74.77 | 677595 | 202730 | 172290 | 74.66 | 669453 | 180152 | 193076 | 12924 | 12360 |
| 32 | Ratnagiri | 121196 | 73.10 | 672678 | 126118 | 115405 | 74.06 | 667635 | 120999 | 120113 | * | * |
| 33 | Sindhudurg | 54277 | 74.12 | 675744 | 56225 | 51241 | 73.67 | 666430 | 53822 | 53548 | * | * |
| 34 | Kolhapur | 244682 | 73.10 | 672678 | 254620 | 205201 | 73.48 | 665828 | 215732 | 242495 | 26763 | 25456 |
| 35 | Sangli | 184564 | 74.98 | 678213 | 190493 | 157079 | 74.66 | 669453 | 164247 | 181422 | 17175 | 16426 |

Source: Computed by the Author. The enumerated child populations are from Registrar General, 2001;

Note : * = in districts where the expected number of female births is less than actual, the number of sex selective abortions is treated as nil. In reality, there could be a small number of such abortions but the number would not be notable.

Table 4.2. Computation of Sex Selective Abortions and Missing Girls due to SSA in Maharashtra and Districts, 2011

| | State/Dist. | Male pop(0-6) | ${}_7L_0$(male) | Male births (04-11) | Female pop(0-6) | ${}_7L_0$(females) | Female births (04-11) | expected female births | Sex Selective Abortions(SSA) | missing girls due to SSA= |
|---|---|---|---|---|---|---|---|---|---|---|
| | MAHARASHTRA | 7035391 | 676978 | 7274644 | 6291126 | 675336 | 6520885 | 6928232 | 407347 | 392995 |
| 1 | Nandurbar | 123582 | 660436 | 130985 | 116640 | 661393 | 123448 | 124748 | 1299 | 1228 |
| 2 | Dhule | 144121 | 670085 | 150555 | 129386 | 664182 | 136364 | 143386 | 7022 | 6663 |
| 3 | Jalgaon | 288827 | 676978 | 298649 | 243178 | 669759 | 254158 | 284428 | 30270 | 28962 |
| 4 | Buldana | 179072 | 675599 | 185540 | 153053 | 673942 | 158971 | 176704 | 17733 | 17073 |
| 5 | Akola | 110372 | 679735 | 113663 | 100708 | 679519 | 103743 | 108250 | 4507 | 4375 |
| 6 | Washim | 81686 | 671464 | 85158 | 70504 | 669759 | 73687 | 81102 | 7415 | 7095 |
| 7 | Amravati | 160934 | 661125 | 170397 | 150457 | 661393 | 159239 | 162283 | 3044 | 2876 |
| 8 | Wardha | 67187 | 672153 | 69971 | 61714 | 671850 | 64300 | 66639 | 2339 | 2245 |
| 9 | Nagpur | 257438 | 668707 | 269485 | 239649 | 668365 | 250992 | 256653 | 5660 | 5405 |
| 10 | Bhandara | 64626 | 652164 | 69366 | 61399 | 655119 | 65605 | 66063 | 458 | 428 |
| 11 | Gondiya | 71764 | 644582 | 77934 | 68601 | 650239 | 73851 | 74223 | 372 | 345 |
| 12 | Gadchiroli | 61320 | 642515 | 66806 | 58952 | 648148 | 63668 | 63625 | 0 | 0 |
| 13 | Chandrapur | 118471 | 651475 | 127295 | 112845 | 656513 | 120320 | 121234 | 914 | 857 |
| 14 | Yavatmal | 171782 | 661125 | 181883 | 158398 | 660696 | 167821 | 173222 | 5401 | 5098 |
| 15 | Nanded | 240620 | 666639 | 252661 | 218952 | 664879 | 230518 | 240630 | 10112 | 9605 |
| 16 | Hingoli | 88052 | 670085 | 91983 | 77664 | 667668 | 81425 | 87603 | 6178 | 5892 |
| 17 | Parbhani | 136605 | 675599 | 141539 | 120715 | 671850 | 125773 | 134799 | 9026 | 8663 |

| | State/Dist. | Male pop(0-6) | $_7L_0$(male) | Male births (04-11) | Female pop(0-6) | $_7L_0$(females) | Female births (04-11) | expected female births | Sex Selective Abortions(SSA) | missing girls due to SSA= |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Jalna | 153642 | 670085 | 160501 | 133696 | 664182 | 140906 | 152858 | 11952 | 11341 |
| 19 | Aurangabad | 286721 | 674910 | 297380 | 245938 | 669759 | 257043 | 283219 | 26176 | 25045 |
| 20 | Nashik | 438050 | 674221 | 454799 | 389885 | 671153 | 406643 | 433142 | 26499 | 25407 |
| 21 | Thane | 689665 | 685249 | 704511 | 637481 | 684399 | 652013 | 670963 | 18950 | 18528 |
| 22 | Mumbai (Suburban) | 486696 | 684560 | 497673 | 444188 | 683702 | 454777 | 473975 | 19198 | 18751 |
| 23 | Mumbai | 142566 | 683181 | 146076 | 130320 | 680216 | 134110 | 139120 | 5009 | 4868 |
| 24 | Raigarh | 155437 | 681114 | 159747 | 145378 | 682307 | 149148 | 152140 | 2992 | 2917 |
| 25 | Pune | 586665 | 692831 | 592735 | 518294 | 691370 | 524763 | 564510 | 39746 | 39256 |
| 26 | Ahmadnagar | 300238 | 681114 | 308563 | 255776 | 678822 | 263756 | 293870 | 30114 | 29203 |
| 27 | Bid | 195245 | 684560 | 199649 | 157645 | 678125 | 162730 | 190142 | 27411 | 26555 |
| 28 | Latur | 168237 | 676978 | 173958 | 149574 | 671850 | 155841 | 165675 | 9834 | 9438 |
| 29 | Osmanabad | 110919 | 678357 | 114458 | 96177 | 674639 | 99793 | 109008 | 9215 | 8881 |
| 30 | Solapur | 285879 | 682492 | 293213 | 252574 | 679519 | 260187 | 279250 | 19063 | 18506 |
| 31 | Satara | 167729 | 692142 | 169633 | 150156 | 690673 | 152184 | 161556 | 9372 | 9247 |
| 32 | Ratnagiri | 80333 | 686628 | 81898 | 75227 | 688582 | 76474 | 77998 | 1523 | 1498 |
| 33 | Sindhudurg | 37034 | 690074 | 37567 | 34159 | 687187 | 34796 | 35778 | 982 | 964 |
| 34 | Kolhapur | 219521 | 686628 | 223796 | 189421 | 686490 | 193149 | 213139 | 19991 | 19605 |
| 35 | Sangli | 164355 | 692831 | 166056 | 142422 | 690673 | 144345 | 158148 | 13803 | 13619 |

Source: Computed by author.

### 4.3 Sex Selective Abortions as percent of total births and female births

**Estimates from 2001 Census**

After getting an idea of volume of abortions in last few paragraphs now it is important to see the intensity of abortions. We can get intensity of abortion by calculating Sex selective abortion per 100 live births. Moreover if we calculate SSAs per 100 female births then we can have clear picture of how strong would be the intensity of discrimination practice.

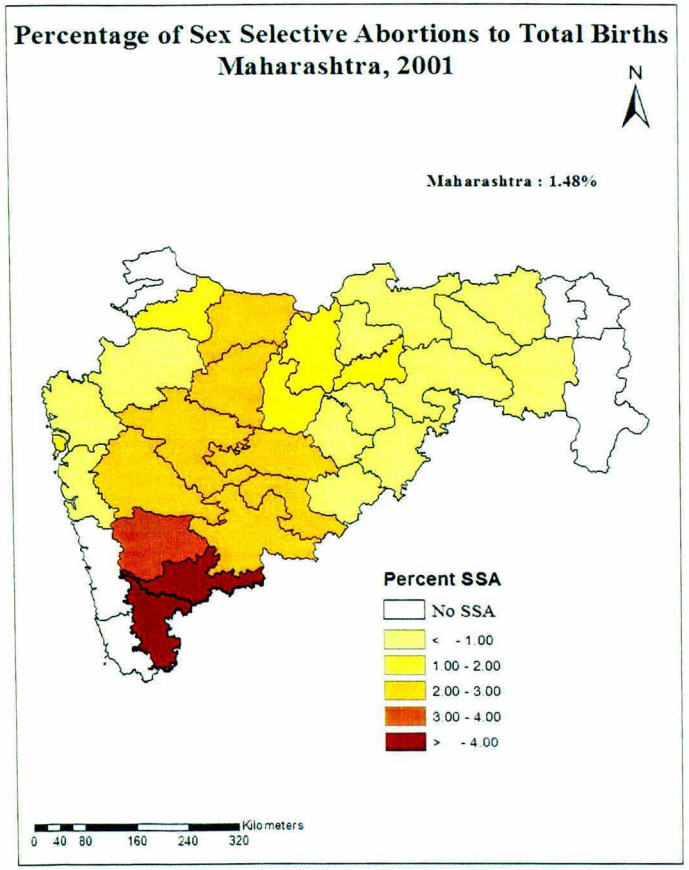
Maharashtra had 1.48 sex selective abortions per 100 live births during 1994-2001, this amounts to 3.08 per 100 female births (Table 4.3). As expected, Kolhapur had highest proportion of sex the selective abortions per hundred female births. Kolhapur recorded 12.41 SSA per 100 female births and 5.69 SSA per 100 total births. Sangli is placed second (10.46) per 100 female births. Satara district had 7.17 sex selective abortions per 100 female births as Satara is small developing district compared to many big developed districts like Mumbai, Nagpur, and Pune. Then Ahmednagar, Jalgaon had 6.03 % SSAs of female births. Osmanabad and Aurangabad had almost 5% SSA of female births (Fig 4.4). All other districts had SSA 1 to 4 % of female births except those districts which did not show any SSA (Fig 4.3).

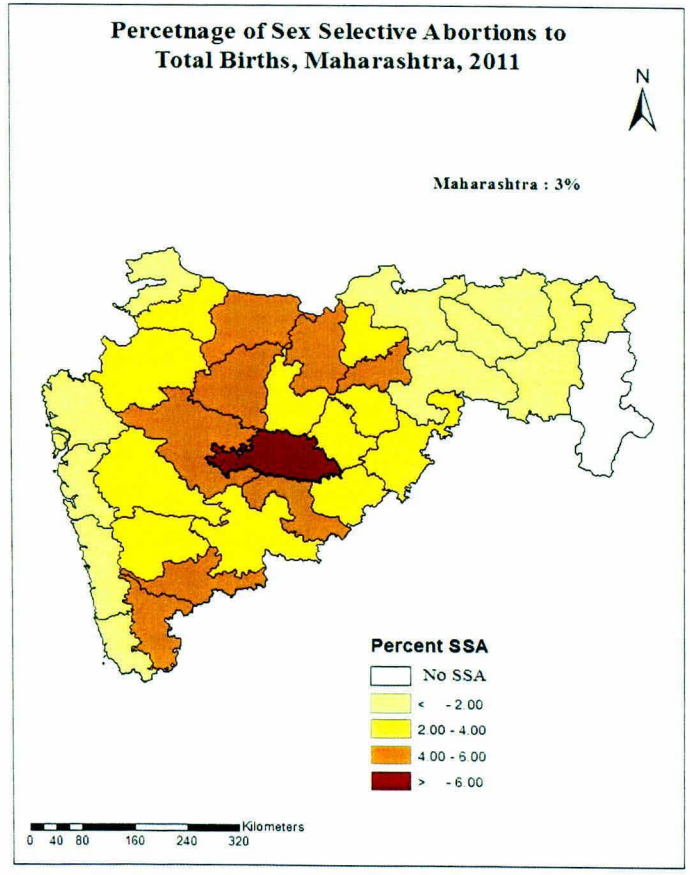
**Estimates from 2011 Census**

By 2011, the level of Sex selective Abortions in Maharashtra was double of that in 2001. This is a disturbing fact. Almost 3 sex selective abortions are taking place in 100 total births, about 6 sex selective abortions happening per 100 female births (Table 4.4). Bid district is emerging as the centre for sex selective abortions. It had 17 sex selective abortions per 100 female births and 8 SSAs per 100 total births. This is a very high proportion and needs urgent attention from the government. Jalgaon district in Nashik division has shown SSAs at 12% of female births and was in second position closely followed by Ahmadnagar (11.4%) and Buldhana (11.2%). Proportion of SSAs has come down or remained the same in western Maharashtra but has alarmingly increased in central Maharashtra. It has increased in other regions as well. (Fig. 4.3, 4.4)

From this analysis we can directly get the number of SSAs per 100 live births and female births. This is the simple and most understandable measure of discrimination against girls.

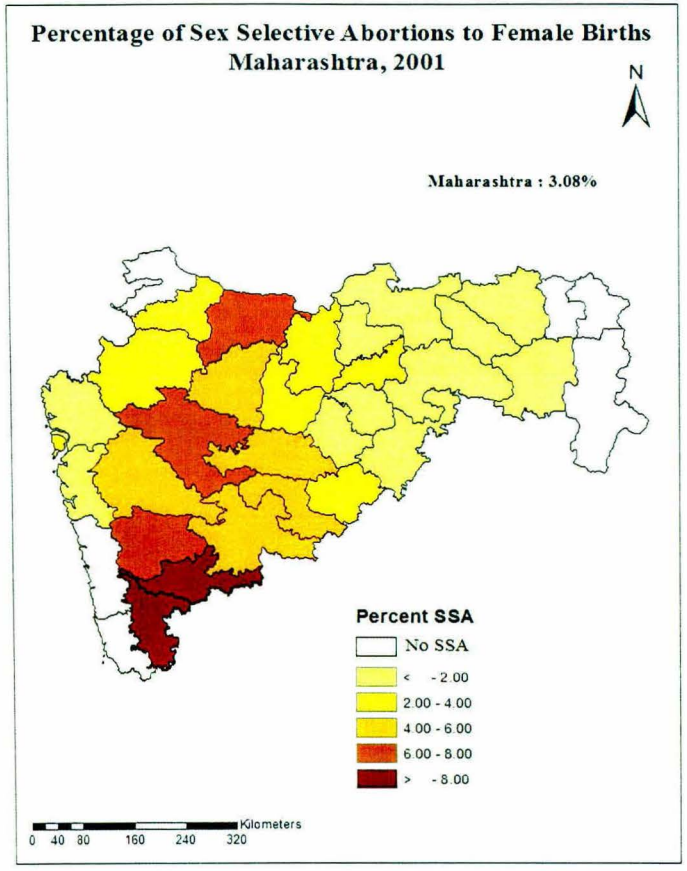
Figure: 4.3 Percentage of Sex Selective Abortions to total births in Maharashtra, 2001 and 2011 (for the periods 1994-2001 and 2004-11).

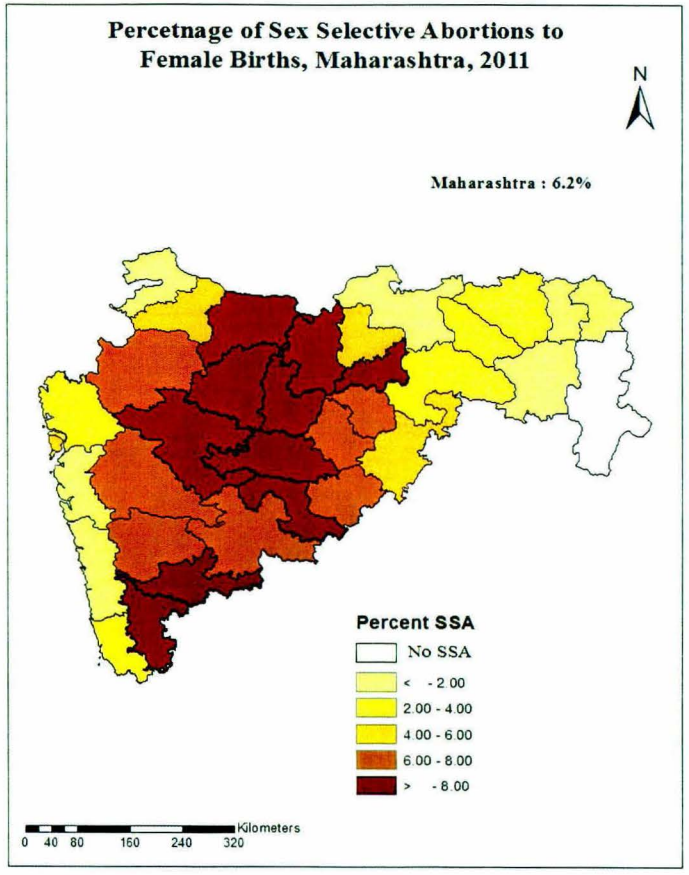



Source: Estimated by Author

Figure. 4.4 Percentage of Sex Selective Abortions to female births , Maharashtra, 2001, 2011( for the periods 1994-2001 and 2004-11).




Source: Estimated by Author

Table 4. 3. Sex Selective Abortions as percent of Total and Female Births in Maharashtra, 2001.

| No | Districts | Number of SSA | Births(94-01) | | Total Births(0-6) | SSA as per cent of births | SSA as a percent of Female births |
|---|---|---|---|---|---|---|---|
| | | | Male | Female | | | |
| | MAHARASHTRA | 214107 | 7531904 | 6959135.14 | 14491039 | 1.48 | 3.08 |
| 1 | Nandurbar | 0 | 123718 | 122533 | 246251 | 0.00 | 0.00 |
| 2 | Dhule | 4254 | 142370 | 131336 | 273705 | 1.55 | 3.24 |
| 3 | Jalgaon | 15964 | 294630 | 264636 | 559265 | 2.85 | 6.03 |
| 4 | Buldana | 6273 | 188293 | 173054 | 361347 | 1.74 | 3.62 |
| 5 | Akola | 1259 | 128118 | 120759 | 248877 | 0.51 | 1.04 |
| 6 | Washim | 2038 | 88846 | 82576 | 171422 | 1.19 | 2.47 |
| 7 | Amravati | 504 | 198381 | 188431 | 386811 | 0.13 | 0.27 |
| 8 | Wardha | 1269 | 85600 | 80255 | 165855 | 0.76 | 1.58 |
| 9 | Nagpur | 341 | 288561 | 274479 | 563041 | 0.06 | 0.12 |
| 10 | Bhandara | 0 | 85766 | 82447 | 168213 | 0.00 | 0.00 |
| 11 | Gondiya | 0 | 96184 | 92277 | 188461 | 0.00 | 0.00 |
| 12 | Gadchiroli | 0 | 86849 | 83894 | 170743 | 0.00 | 0.00 |
| 13 | Chandrapur | 1670 | 157102 | 147951 | 305053 | 0.55 | 1.13 |
| 14 | Yavatmal | 2133 | 205706 | 193777 | 399483 | 0.53 | 1.10 |
| 15 | Nanded | 3325 | 264398 | 248483 | 512881 | 0.65 | 1.34 |
| 16 | Hingoli | 1247 | 92229 | 86590 | 178819 | 0.70 | 1.44 |
| 17 | Parbhani | 2201 | 138609 | 129807 | 268416 | 0.82 | 1.70 |
| 18 | Jalna | 4893 | 146075 | 134226 | 280301 | 1.75 | 3.65 |
| 19 | Aurangabad | 12175 | 261607 | 236975 | 498582 | 2.44 | 5.14 |
| 20 | Nashik | 8393 | 434811 | 405713 | 840524 | 1.00 | 2.07 |
| 21 | Thane | 6623 | 618029 | 581977 | 1200006 | 0.55 | 1.14 |
| 22 | Mumbai (Suburban) | 10845 | 556148 | 518820 | 1074969 | 1.01 | 2.09 |
| 23 | Mumbai | 3312 | 184807 | 172695 | 357501 | 0.93 | 1.92 |
| 24 | Raigarh | 993 | 170192 | 161095 | 331287 | 0.30 | 0.62 |
| 25 | Pune | 20680 | 525730 | 480016 | 1005746 | 2.06 | 4.31 |
| 26 | Ahmadnagar | 18558 | 328039 | 293861 | 621900 | 2.98 | 6.32 |
| 27 | Bid | 7801 | 184754 | 168155 | 352909 | 2.21 | 4.64 |
| 28 | Latur | 3483 | 179583 | 167548 | 347131 | 1.00 | 2.08 |
| 29 | Osmanabad | 5654 | 123993 | 112435 | 236428 | 2.39 | 5.03 |
| 30 | Solapur | 14219 | 314548 | 285351 | 599899 | 2.37 | 4.98 |
| 31 | Satara | 12924 | 202730 | 180152 | 382881 | 3.38 | 7.17 |
| 32 | Ratnagiri | 0 | 126118 | 120999 | 247118 | 0.00 | 0.00 |
| 33 | Sindhudurg | 0 | 56225 | 53822 | 110047 | 0.00 | 0.00 |
| 34 | Kolhapur | 26763 | 254620 | 215732 | 470352 | 5.69 | 12.41 |
| 35 | Sangli | 17175 | 190493 | 164247 | 354740 | 4.84 | 10.46 |

Source : Table no. 4.1

Table 4.4 Sex Selective Abortions as percent of Total and Female Births in Maharashtra, 2011

| No. | Districts | Number of SSA | Number of Births(2004-11) | | Total Births (0-6) | SSA as per cent of total births | SSA as a percent of Female births |
|---|---|---|---|---|---|---|---|
| | | | Male | Female | | | |
| | MAHARASHTRA | 407347 | 7274644 | 6520885 | 13795528 | 3.0 | 6.2 |
| 1 | Nandurbar | 1299 | 130985 | 123448 | 254434 | 0.5 | 1.1 |
| 2 | Dhule | 7022 | 150555 | 136364 | 286919 | 2.4 | 5.1 |
| 3 | Jalgaon | 30270 | 298649 | 254158 | 552807 | 5.5 | 11.9 |
| 4 | Buldana | 17733 | 185540 | 158971 | 344510 | 5.1 | 11.2 |
| 5 | Akola | 4507 | 113663 | 103743 | 217406 | 2.1 | 4.3 |
| 6 | Washim | 7415 | 85158 | 73687 | 158845 | 4.7 | 10.1 |
| 7 | Amravati | 3044 | 170397 | 159239 | 329637 | 0.9 | 1.9 |
| 8 | Wardha | 2339 | 69971 | 64300 | 134270 | 1.7 | 3.6 |
| 9 | Nagpur | 5660 | 269485 | 250992 | 520477 | 1.1 | 2.3 |
| 10 | Bhandara | 458 | 69366 | 65605 | 134972 | 0.3 | 0.7 |
| 11 | Gondiya | 372 | 77934 | 73851 | 151785 | 0.2 | 0.5 |
| 12 | Gadchiroli | 0 | 66806 | 63668 | 130474 | 0.0 | 0.0 |
| 13 | Chandrapur | 914 | 127295 | 120320 | 247615 | 0.4 | 0.8 |
| 14 | Yavatmal | 5401 | 181883 | 167821 | 349704 | 1.5 | 3.2 |
| 15 | Nanded | 10112 | 252661 | 230518 | 483179 | 2.1 | 4.4 |
| 16 | Hingoli | 6178 | 91983 | 81425 | 173408 | 3.6 | 7.6 |
| 17 | Parbhani | 9026 | 141539 | 125773 | 267312 | 3.4 | 7.2 |
| 18 | Jalna | 11952 | 160501 | 140906 | 301407 | 4.0 | 8.5 |
| 19 | Aurangabad | 26176 | 297380 | 257043 | 554422 | 4.7 | 10.2 |
| 20 | Nashik | 26499 | 454799 | 406643 | 861442 | 3.1 | 6.5 |
| 21 | Thane | 18950 | 704511 | 652013 | 1356524 | 1.4 | 2.9 |
| 22 | Mumbai (Suburban) | 19198 | 497673 | 454777 | 952450 | 2.0 | 4.2 |
| 23 | Mumbai | 5009 | 146076 | 134110 | 280186 | 1.8 | 3.7 |
| 24 | Raigarh | 2992 | 159747 | 149148 | 308895 | 1.0 | 2.0 |
| 25 | Pune | 39746 | 592735 | 524763 | 1117499 | 3.6 | 7.6 |
| 26 | Ahmadnagar | 30114 | 308563 | 263756 | 572319 | 5.3 | 11.4 |
| 27 | Bid | 27411 | 199649 | 162730 | 362379 | 7.6 | 16.8 |
| 28 | Latur | 9834 | 173958 | 155841 | 329799 | 3.0 | 6.3 |
| 29 | Osmanabad | 9215 | 114458 | 99793 | 214250 | 4.3 | 9.2 |
| 30 | Solapur | 19063 | 293213 | 260187 | 553399 | 3.4 | 7.3 |
| 31 | Satara | 9372 | 169633 | 152184 | 321817 | 2.9 | 6.2 |
| 32 | Ratnagiri | 1523 | 81898 | 76474 | 158372 | 1.0 | 2.0 |
| 33 | Sindhudurg | 982 | 37567 | 34796 | 72363 | 1.4 | 2.8 |
| 34 | Kolhapur | 19991 | 223796 | 193149 | 416945 | 4.8 | 10.3 |
| 35 | Sangli | 13803 | 166056 | 144345 | 310401 | 4.4 | 9.6 |

Source : Table 4.2

## 4.4 Missing girls due to excess female child mortality

### Estimates for 2001 census

The Under Five Mortality Rates based on 2001 census (indirect estimates obtained using the Brass method and provided by the office of Registrar General) showed that in every district of Maharashtra female child mortality was higher than male child mortality (RG, 2008). State level female under five mortality rates was 70 and male rate was 57 in 2001.The estimates actually refer to a period before the census, roughly to 1996. Research also suggests girls always had disadvantage in health, care and nutrition because of the discrimination. As Guilmoto (2011) documented in the absence of any discrimination against girls, male child mortality tends to be the 20% higher than female child mortality across world. But in India female child mortality is higher than male mortality. It means, in India female children are dying excessively unlike other countries because of discriminatory practices against them.

Based on estimated of $q_5$ values provided by the office of Registrar General , survival ratios for the age group 0-6 ($_7L_0$) were computed by invoking the U.N. South Asian Model Life Tables for each district by sex.

Further, the expected survival ratios for females were computed by applying the 20% higher male mortality assumption to the male survival ratios. This gives the number of girls of ages 0-6 that would have been alive in 2001 had female mortality been lower than male mortality at the normal level. The difference between this value and the actual number of girls of age 0-6 is the number of missing girls due to excess female mortality. The details of the methodology are given in chapter 2.

In the state of Maharashtra, 133000 girls of ages 0-6 were missing in 2001 due to discrimination against them. This figure is not small to ignore. Thane district has the highest excess female child mortality. Thane district had 9803 excess deaths of girls due to discrimination followed by Nashik which had 8676 missing girls due to excess female child mortality. Mumbai Suburban had 8808 girl missing due to excess female child mortality. Pune and Jalgaon districts also had 6 to 8 thousand missing girls due to excess

mortality. Solapur and Ahmednagar had around 5600 excess female child deaths (Table 4.5).

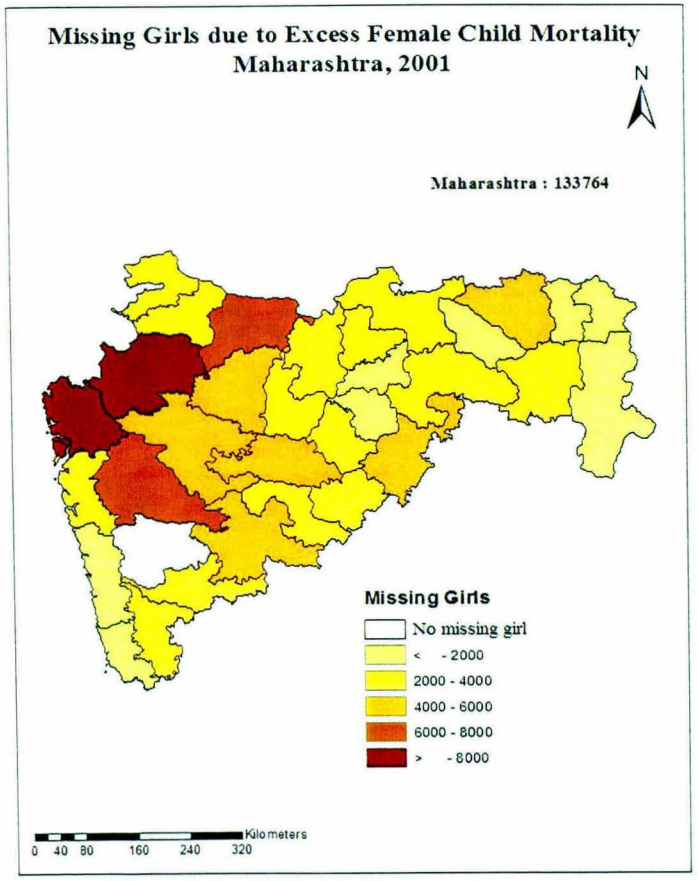
Kolhapur, Sangli, Dhule, Buldhana, Yavatmal, Jalana, Mumbai, and Raigarh, Bid, Latur, had around 2500 to 3500 excess female child deaths. Maharashtra state had not shown any spatial pattern of excess female child deaths.

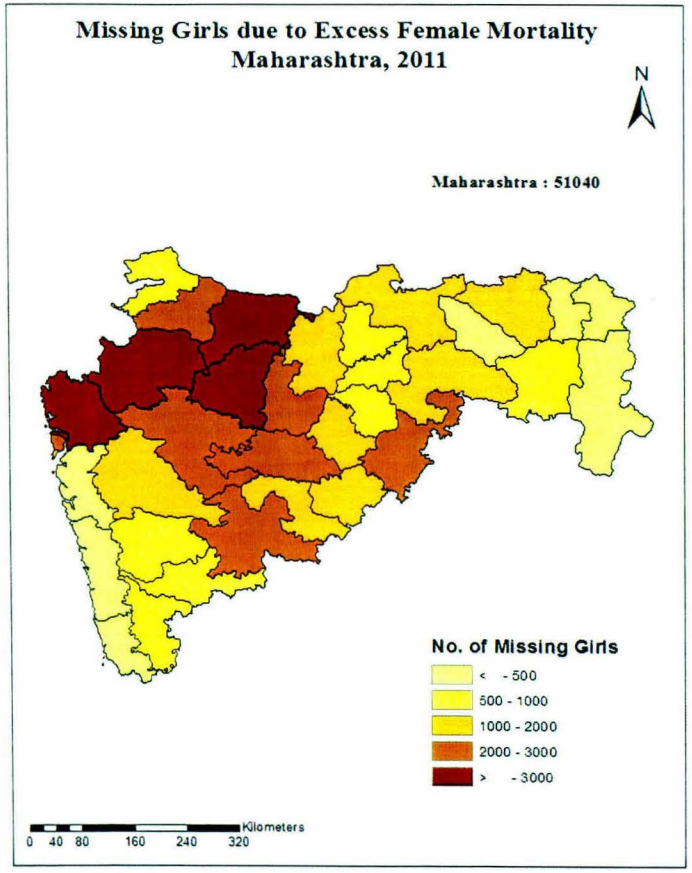
**Estimates for 2011 Census**

Excess Female Mortality for census 2011 has been calculated using the same approach used for Census 2001.Under five mortality rates were not available for Census 2011. Hence, the ratio of district-level child mortality estimates (q5) to the state level (q5) based on the children ever born and children surviving data of the 2001 Census was computed. This was applied to the state level SRS estimates of survival ratios for the period 2006-10 and by that we estimated district level survival ratios. Missing girls due to excess female mortality is the simple difference between expected number of living and actual number of girls on census date.

Figures of missing girls due to excess female mortality of 2011 census got reduced extensively from census 2001. Census 2011 found 51040 missing girls due to excess mortality (Table 4.6). Nashik has 4278 missing girls due to excess female child mortality which is the highest in the state followed by Jalgaon (4014) and Aurangabad (3427). Deaths due to neglect have decreased in almost all districts except Satara; but the volume is still very small in this district. Thane, Mumbai suburban and also districts from central part like Bid, Latur, Solapur, Nanded, Dhule districts had around two thousand missing girls due to excess mortality. Excess mortality fell sharply in Nashik, Mumbai, and Mumbai Suburban districts.(Fig. 4.5)

Figure. 4.5 Missing girls due to Excess Female Child Mortality, Maharashtra, 2001 and 2011.




Source: Estimated by Author

Table 4. 5. Estimation of Missing girls due to Excess female mortality, Maharashtra, 2001. .

| | Districts | Female births | U5MR(male) | Expected U5MR (Females) | Expected $l_5$(females) | Expected female $_7L_0$ | exp $e_0^0$ | Expected girls(0-6) | Actual female pop(0-6) | Missing girls |
|---|---|---|---|---|---|---|---|---|---|---|
| | MAHARASHTRA | 6959135 | 57 | 47.5 | 95250 | 669756 | 74.76 | 6658458 | 6524694 | 133764 |
| 1 | Nandurbar | 122533 | 81 | 67.5 | 93250 | 657762 | 71.01 | 115139 | 112827 | 2312 |
| 2 | Dhule | 131336 | 67 | 55.8 | 94417 | 664726 | 73.13 | 124718 | 121370 | 3348 |
| 3 | Jalgaon | 264636 | 57 | 47.5 | 95250 | 668223 | 74.76 | 252622 | 246117 | 6505 |
| 4 | Buldana | 173054 | 59 | 49.2 | 95083 | 668746 | 74.43 | 165328 | 161962 | 3366 |
| 5 | Akola | 120759 | 53 | 44.2 | 95583 | 671775 | 75.44 | 115890 | 113831 | 2059 |
| 6 | Washim | 82576 | 65 | 54.2 | 94583 | 664796 | 73.45 | 78424 | 76798 | 1626 |
| 7 | Amravati | 188431 | 80 | 66.7 | 93333 | 658257 | 71.16 | 177194 | 173505 | 3689 |
| 8 | Wardha | 80255 | 64 | 53.3 | 94667 | 666229 | 73.61 | 76383 | 74908 | 1475 |
| 9 | Nagpur | 274479 | 69 | 57.5 | 94250 | 663724 | 72.82 | 260255 | 255027 | 5228 |
| 10 | Bhandara | 82447 | 93 | 77.5 | 92250 | 651874 | 69.33 | 76779 | 75302 | 1477 |
| 11 | Gondiya | 92277 | 104 | 86.7 | 91333 | 646495 | 67.84 | 85224 | 83764 | 1460 |
| 12 | Gadchiroli | 83894 | 107 | 89.2 | 91083 | 645038 | 67.45 | 77307 | 76020 | 1287 |
| 13 | Chandrapur | 147951 | 94 | 78.3 | 92167 | 651377 | 69.18 | 137674 | 135373 | 2301 |
| 14 | Yavatmal | 193777 | 80 | 66.7 | 93333 | 658257 | 71.16 | 182222 | 178267 | 3955 |
| 15 | Nanded | 248483 | 72 | 60.0 | 94000 | 662228 | 72.35 | 235075 | 229835 | 5240 |
| 16 | Hingoli | 86590 | 67 | 55.8 | 94417 | 664724 | 73.13 | 82226 | 80381 | 1845 |
| 17 | Parbhani | 129807 | 59 | 49.2 | 95083 | 668746 | 74.43 | 124012 | 121159 | 2853 |

| | Districts | Female births | U5MR(male) | Expected U5MR (Females) | Expected $l_5$(females) | Expected female $_7L_0$ | exp $e_0^0$ | Expected girls(0-6) | Actual female pop(0-6) | Missing girls |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Jalna | 134226 | 67 | 55.8 | 94417 | 664724 | 73.13 | 127462 | 124041 | 3421 |
| 19 | Aurangabad | 236975 | 60 | 50.0 | 95000 | 667717 | 74.26 | 226046 | 220392 | 5654 |
| 20 | Nashik | 405713 | 61 | 50.8 | 94917 | 667736 | 74.09 | 387013 | 378337 | 8676 |
| 21 | Thane | 581977 | 45 | 37.5 | 96250 | 675814 | 76.78 | 561869 | 552066 | 9803 |
| 22 | Mumbai (Suburban) | 518820 | 46 | 38.3 | 96167 | 675310 | 76.61 | 500520 | 491712 | 8808 |
| 23 | Mumbai | 172695 | 48 | 40.0 | 96000 | 674300 | 76.27 | 166354 | 162934 | 3420 |
| 24 | Raigarh | 161095 | 51 | 42.5 | 95750 | 672785 | 75.77 | 154832 | 152402 | 2430 |
| 25 | Pune | 480016 | 34 | 28.3 | 97167 | 681368 | 78.62 | 467239 | 459484 | 7755 |
| 26 | Ahmadnagar | 293861 | 51 | 42.5 | 95750 | 672785 | 75.77 | 282436 | 276753 | 5683 |
| 27 | Bid | 168155 | 46 | 38.3 | 96167 | 675310 | 76.61 | 162224 | 158223 | 4001 |
| 28 | Latur | 167548 | 57 | 47.5 | 95250 | 669756 | 74.76 | 160309 | 156385 | 3924 |
| 29 | Osmanabad | 112435 | 55 | 45.8 | 95417 | 670766 | 75.10 | 107739 | 105322 | 2417 |
| 30 | Solapur | 285351 | 49 | 40.8 | 95917 | 673795 | 76.11 | 274669 | 268981 | 5688 |
| 31 | Satara | 180152 | 35 | 29.2 | 97083 | 669453 | 74.66 | 172290 | 172290 | * |
| 32 | Ratnagiri | 120999 | 43 | 35.8 | 96417 | 676824 | 77.11 | 116993 | 115405 | 1588 |
| 33 | Sindhudurg | 53822 | 38 | 31.7 | 96833 | 679349 | 77.95 | 52234 | 51241 | 993 |
| 34 | Kolhapur | 215732 | 43 | 35.8 | 96417 | 676764 | 76.97 | 208571 | 205201 | 3370 |
| 35 | Sangli | 164247 | 34 | 28.3 | 97167 | 681368 | 78.62 | 159875 | 157079 | 2796 |

Source: Computed by author using data from Registrar General 2001; District wise Under Five Mortality estimates (based on 2001 Census).

*Note : The estimation show no evidence of excess female mortality.

Table 4.6. Estimation of Missing girls due to Excess Female Child Mortality, Maharashtra, 2011.

| | State/Dist | ${}_7L_0$(males) | Proportion living for males | Proportion died for males | Expected female proportion dead | Expected female proportion living | female births | Expected girls alive | Actual female pop(0-6) | Missing Girls Due to Excess Female Mortality |
|---|---|---|---|---|---|---|---|---|---|---|
| | MAHARASHTRA | 676978 | 0.97 | 0.03 | 0.027 | 0.973 | 6520885 | 6342166 | 6291126 | 51040 |
| 1 | Nandurbar | 660436 | 0.94 | 0.06 | 0.047 | 0.953 | 123448 | 117634 | 116640 | 994 |
| 2 | Dhule | 670085 | 0.96 | 0.04 | 0.036 | 0.964 | 136364 | 131507 | 129386 | 2121 |
| 3 | Jalgaon | 676978 | 0.97 | 0.03 | 0.027 | 0.973 | 254158 | 247192 | 243178 | 4014 |
| 4 | Buldana | 675599 | 0.97 | 0.03 | 0.029 | 0.971 | 158971 | 154353 | 153053 | 1300 |
| 5 | Akola | 679735 | 0.97 | 0.03 | 0.024 | 0.976 | 103743 | 101241 | 100708 | 533 |
| 6 | Washim | 671464 | 0.96 | 0.04 | 0.034 | 0.966 | 73687 | 71184 | 70504 | 680 |
| 7 | Amravati | 661125 | 0.94 | 0.06 | 0.046 | 0.954 | 159239 | 151870 | 150457 | 1413 |
| 8 | Wardha | 672153 | 0.96 | 0.04 | 0.033 | 0.967 | 64300 | 62168 | 61714 | 454 |
| 9 | Nagpur | 668707 | 0.96 | 0.04 | 0.037 | 0.963 | 250992 | 241642 | 239649 | 1993 |
| 10 | Bhandara | 652164 | 0.93 | 0.07 | 0.057 | 0.943 | 65605 | 61869 | 61399 | 470 |
| 11 | Gondiya | 644582 | 0.92 | 0.08 | 0.066 | 0.934 | 73851 | 68979 | 68601 | 378 |
| 12 | Gadchiroli | 642515 | 0.92 | 0.08 | 0.068 | 0.932 | 63668 | 59311 | 58952 | 359 |
| 13 | Chandrapur | 651475 | 0.93 | 0.07 | 0.058 | 0.942 | 120320 | 113369 | 112845 | 524 |
| 14 | Yavatmal | 661125 | 0.94 | 0.06 | 0.046 | 0.954 | 167821 | 160054 | 158398 | 1656 |
| 15 | Nanded | 666639 | 0.95 | 0.05 | 0.040 | 0.960 | 230518 | 221363 | 218952 | 2411 |
| 16 | Hingoli | 670085 | 0.96 | 0.04 | 0.036 | 0.964 | 81425 | 78525 | 77664 | 861 |

| | State/Dist | $_7L_0$(males) | Proportion living for males | Proportion died for males | Expected female proportion dead | Expected female proportion living | female births | Expected girls alive | Actual female pop(0-6) | Missing Girls Due to Excess Female Mortality |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Parbhani | 675599 | 0.97 | 0.03 | 0.029 | 0.971 | 125773 | 122119 | 120715 | 1404 |
| 18 | Jalna | 670085 | 0.96 | 0.04 | 0.036 | 0.964 | 140906 | 135888 | 133696 | 2192 |
| 19 | Aurangabad | 674910 | 0.96 | 0.04 | 0.030 | 0.970 | 257043 | 249365 | 245938 | 3427 |
| 20 | Nashik | 674221 | 0.96 | 0.04 | 0.031 | 0.969 | 406643 | 394163 | 389885 | 4278 |
| 21 | Thane | 685249 | 0.98 | 0.02 | 0.018 | 0.982 | 652013 | 640563 | 637481 | 3082 |
| 22 | Mumbai (Suburban) | 684560 | 0.98 | 0.02 | 0.018 | 0.982 | 454777 | 446417 | 444188 | 2229 |
| 23 | Mumbai | 683181 | 0.98 | 0.02 | 0.020 | 0.980 | 134110 | 131425 | 130320 | 1105 |
| 24 | Raigarh | 681114 | 0.97 | 0.03 | 0.022 | 0.978 | 149148 | 145794 | 145378 | 416 |
| 25 | Pune | 692831 | 0.99 | 0.01 | 0.009 | 0.991 | 524763 | 520285 | 518294 | 1991 |
| 26 | Ahmadnagar | 681114 | 0.97 | 0.03 | 0.022 | 0.978 | 263756 | 257826 | 255776 | 2050 |
| 27 | Bid | 684560 | 0.98 | 0.02 | 0.018 | 0.982 | 162730 | 159739 | 157645 | 2094 |
| 28 | Latur | 676978 | 0.97 | 0.03 | 0.027 | 0.973 | 155841 | 151570 | 149574 | 1996 |
| 29 | Osmanabad | 678357 | 0.97 | 0.03 | 0.026 | 0.974 | 99793 | 97221 | 96177 | 1044 |
| 30 | Solapur | 682492 | 0.97 | 0.03 | 0.021 | 0.979 | 260187 | 254764 | 252574 | 2190 |
| 31 | Satara | 692142 | 0.99 | 0.01 | 0.009 | 0.991 | 152184 | 150760 | 150156 | 604 |
| 32 | Ratnagiri | 686628 | 0.98 | 0.02 | 0.016 | 0.984 | 76474 | 75257 | 75227 | 30 |
| 33 | Sindhudurg | 690074 | 0.99 | 0.01 | 0.012 | 0.988 | 34796 | 34385 | 34159 | 226 |
| 34 | Kolhapur | 686628 | 0.98 | 0.02 | 0.016 | 0.984 | 193149 | 190074 | 189421 | 653 |
| 35 | Sangli | 692831 | 0.99 | 0.01 | 0.009 | 0.991 | 144345 | 143113 | 142422 | 691 |

Source: Computed by author using data from Registrar General, 2013, United Nations South Asian Model Life tables, 1985.

## 4.5 Estimation of total number of missing girls

After estimations of missing girls due to SSA and missing girls due to Excess Female Child Mortality (EFCM), it is easy to sum them and get total missing girls in all districts of Maharashtra. It is important to see contribution of Missing girls due to SSA and Excess Female Child Mortality (EFCM) to the total Missing girls of state.

### Missing girls of ages 0-6 in 2001

Maharashtra had total 334505 missing girls in 2001(Table 4.7). Of these 60% girls were missing due to Sex selective abortions and 40% due to excess female child mortality. SSA was the major contributing factor than mortality differentials. The highest number of missing girls is recorded in Kolhapur district, 28827 total missing girls were in Kolhapur out of which 88.3% contributed by sex selective abortions alone and only 11.7 % contributed from excess female child mortality. Pune district secured second position in terms of missing girls, it recorded 27551 missing girls and contribution of SSA and excess female mortality is 72 % and 28% respectively; 23160 girls would have been in Ahamadnagar district but were missing due to 75% SSAs and 25% mortality due to gender discrimination (Fig.4.7 and 4.8). Sangli district also had higher contribution of SSA(85%) than mortality (15%) to its missing girls. Missing girls of Satara district are fully contributed by SSA as there was no evidence of excess mortality of female children (Fig.4.6). Sindhudurg, Ratnagiri, Nandurbar, Gondia, Bhandara, Gadchiroli had less number of missing girls that too only contributed by excess mortality of female children. Mumbai, Mumbai suburban and Jalgoan districts had substantial number of missing girls mainly contributed by SSAs. Some districts of Maharashtra (from western part) hold high proportion of missing girls that too from SSAs.

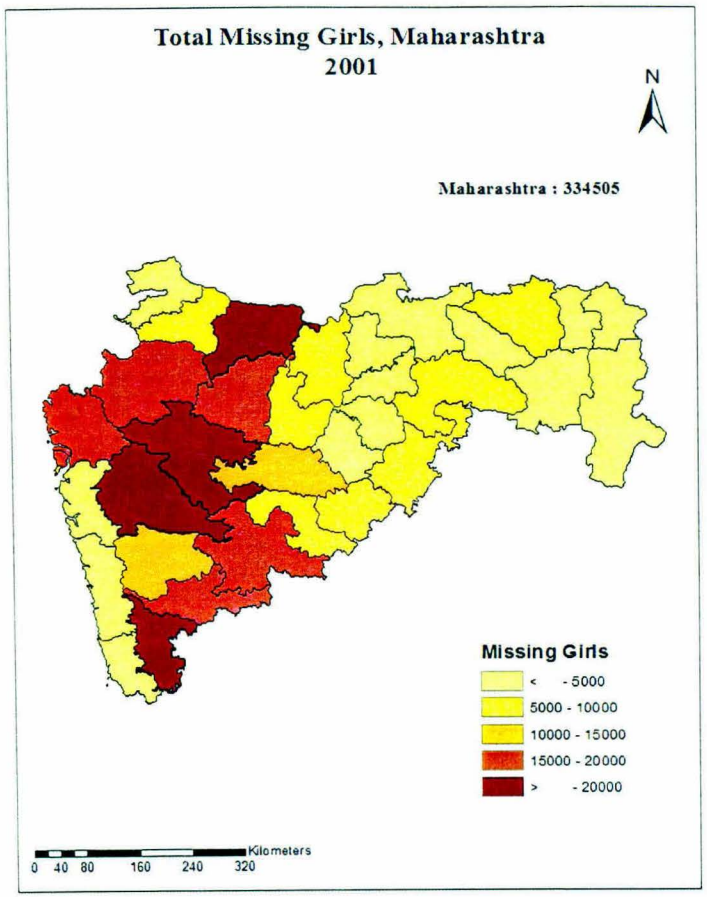
### Missing girls of ages 0-6 in 2011

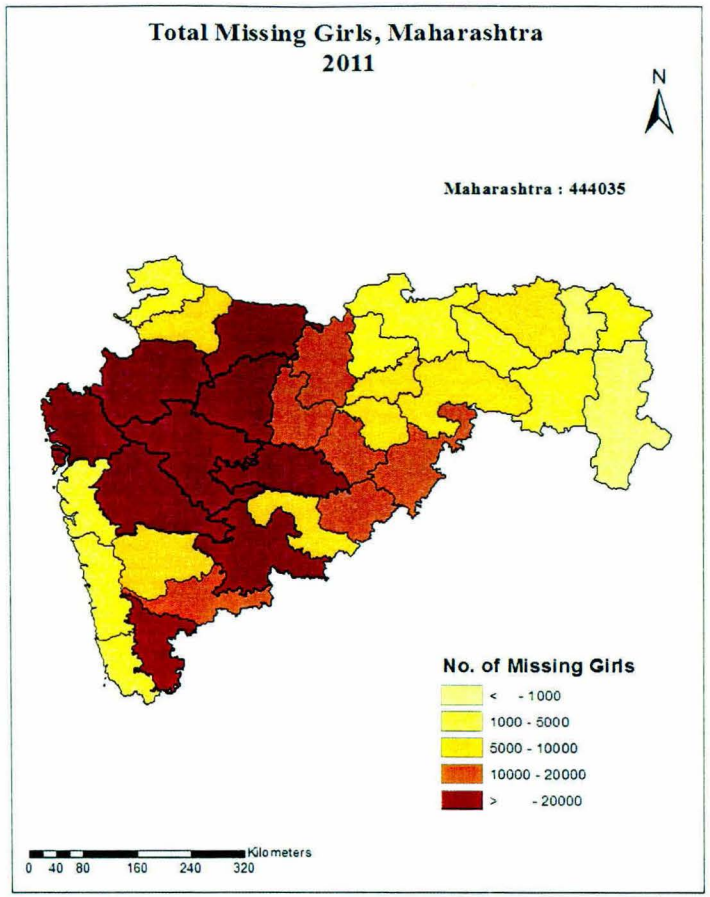
Figures of total missing girls increased about 109530 in the year 2011. The state recorded 444035 total missing girls. Sex selective abortions contributed about 90% and excess female child mortality contributed only 10% to the total missing girls (Table 4.8).

Proportion of SSA to missing girls has increased tremendously over decade. Pune district has the highest number of missing girls (41247) mainly contributed by SSA(95%). Jalgoan district has 32976 missing girls by high proportion of SSA (88%) and followed by Ahmednagar (31252) (Fig.4.7). Districts from Pune division and Ahmednagar division have high number of missing girls from very high proportion of SSA (above 90%). Moreover districts located on the northern border of Maharashtra and (Jalgaon, Buldhana, Akola, and Amravati) have increased number of missing girls and increased proportion of SSAs. However districts like Satara, Kolhapur, Sangli, and Ratnagiri have shown decrease in their missing girls but still show high proportion of SSA. Gadchiroli and Chandrapur have also shown decrease in missing girls as excess female child mortality has decreased in those districts (Fig.4.8). Gondiya district has shown constant figure in 2001 so as 2011.

Earlier only western Maharashtra had higher proportion of SSAs but now it has spread to other parts of Maharashtra especially central and north central part of Maharashtra. In fact, western Maharashtra districts controlled the situation of sex selection somewhat and their number of missing girls due to selective abortion decreased and that figures increased sharply in districts like Bid, Latur, Ahmednagar. This trend needs strong attention from government.

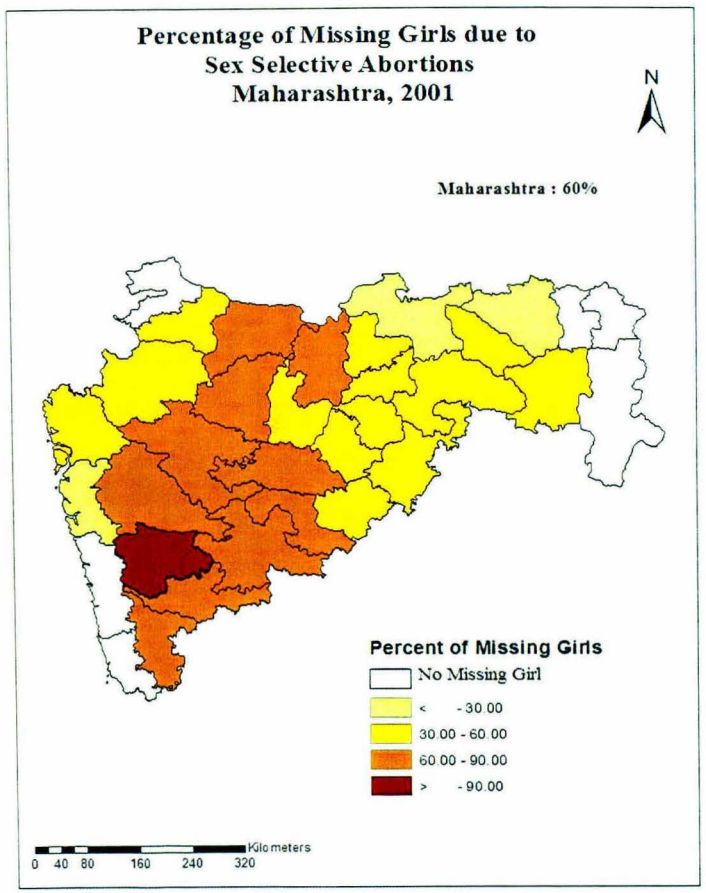
Figure. 4.6 Total number of Missing girls, Maharashtra, 2001 and 2011.

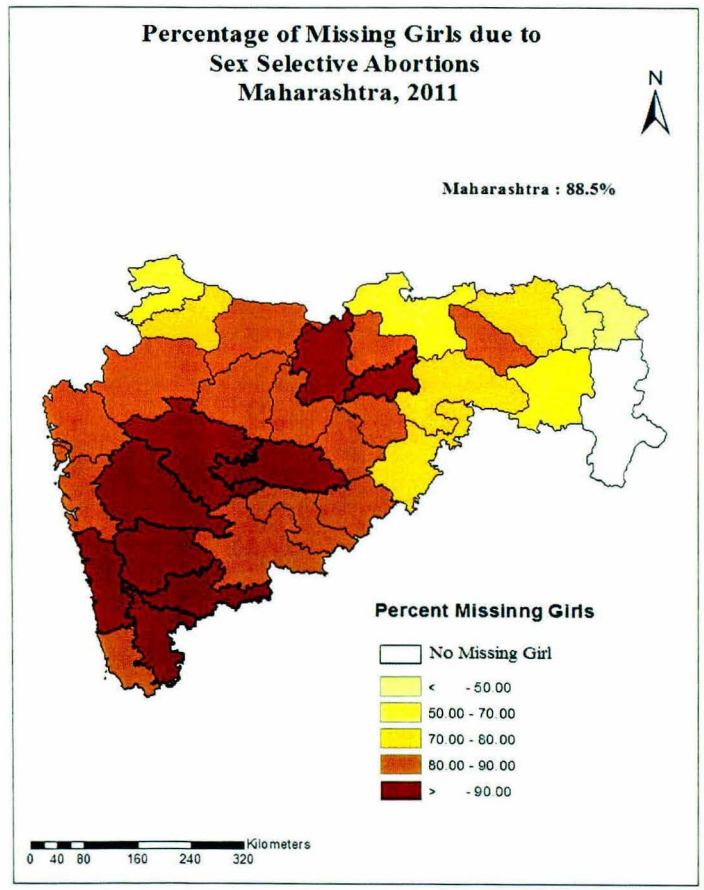



Source: Estimated by Author

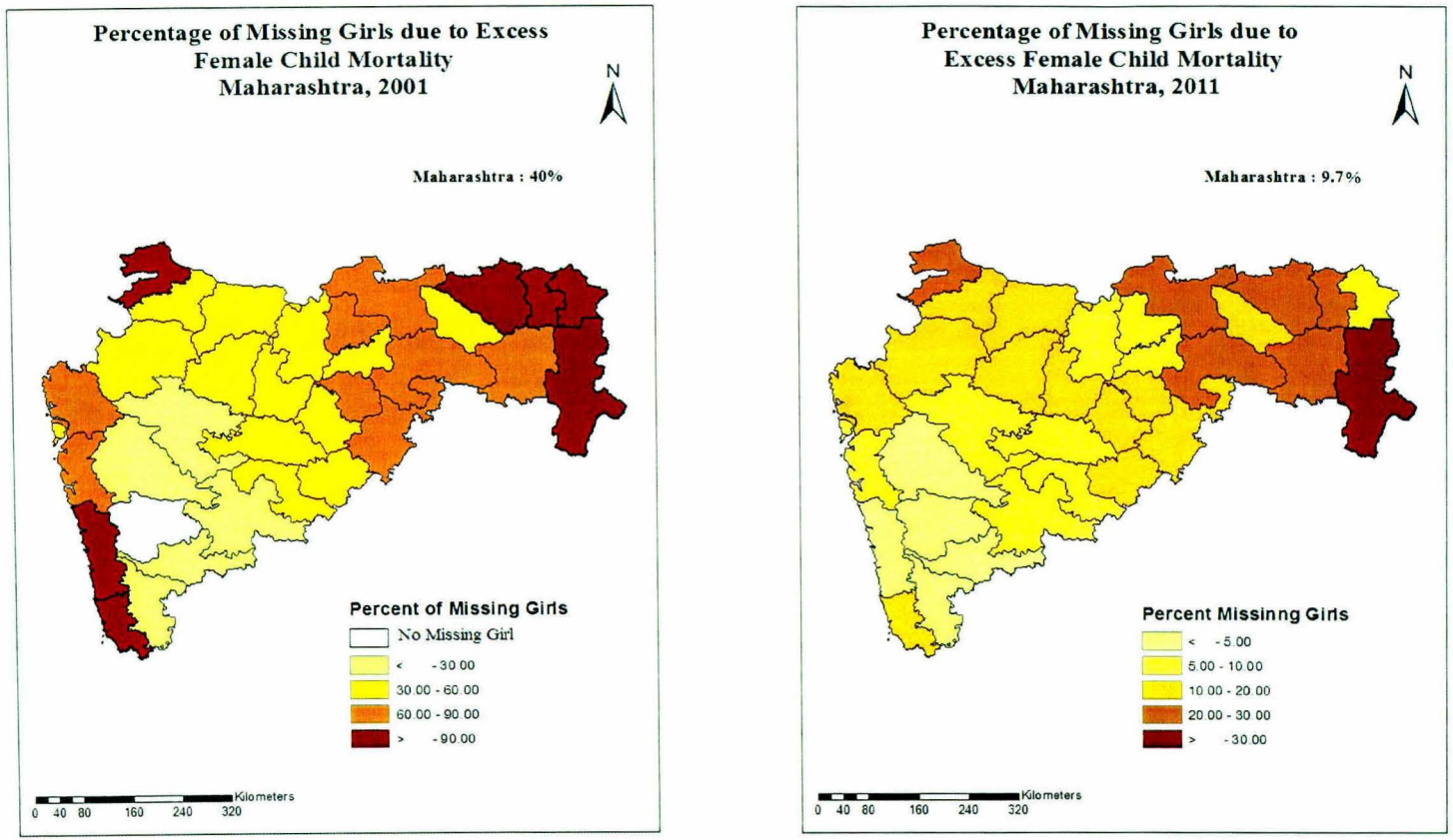
Figure. 4.7 Percentage of Missing girls due to Sex Selective abortions, Maharashtra, 2001 and 2011.




Source: Estimated by Author

Figure. 4.8 Percentage of Missing girls due to Excess Female Child Mortality, Maharashtra, 2001 and 2011.




Source: Estimated by Author

Table 4.7 Estimation of Total Missing Girls and contribution of missing due to SSA and due to Excess Female Child Mortality, Maharashtra, 2001.

| State/Dist. | Missing girls due to SSA= | Missing girls due to excess female child mortality | Total Missing girls | % missing girls due to excess female child mortality | % missing due to SSA |
|---|---|---|---|---|---|
| MAHARASHTRA | 200741 | 133764 | 334505 | 40.0 | 60.0 |
| Nandurbar | neg | 2312 | 2312 | 100.0 | 0.0 |
| Dhule | 3931 | 3348 | 7279 | 46.0 | 54.0 |
| Jalgaon | 14847 | 6505 | 21352 | 30.5 | 69.5 |
| Buldana | 5871 | 3366 | 9236 | 36.4 | 63.6 |
| Akola | 1187 | 2059 | 3245 | 63.4 | 36.6 |
| Washim | 1896 | 1626 | 3521 | 46.2 | 53.8 |
| Amravati | 464 | 3689 | 4153 | 88.8 | 11.2 |
| Wardha | 1184 | 1475 | 2659 | 55.5 | 44.5 |
| Nagpur | 317 | 5228 | 5545 | 94.3 | 5.7 |
| Bhandara | neg | 1477 | 1477 | 100.0 | 0.0 |
| Gondiya | Neg | 1460 | 3860 | 100.0 | 0.0 |
| Gadchiroli | neg | 1287 | 1287 | 100.0 | 0.0 |
| Chandrapur | 1528 | 2301 | 3829 | 60.1 | 39.9 |
| Yavatmal | 1962 | 3955 | 5917 | 66.8 | 33.2 |
| Nanded | 3075 | 5240 | 8315 | 63.0 | 37.0 |
| Hingoli | 1158 | 1845 | 3003 | 61.5 | 38.5 |
| Parbhani | 2054 | 2853 | 4907 | 58.1 | 41.9 |
| Jalna | 4521 | 3421 | 7943 | 43.1 | 56.9 |
| Aurangabad | 11323 | 5654 | 16977 | 33.3 | 66.7 |
| Nashik | 7827 | 8676 | 16503 | 52.6 | 47.4 |
| Thane | 6283 | 9803 | 16085 | 60.9 | 39.1 |
| Mumbai (Suburban) | 10278 | 8808 | 19087 | 46.2 | 53.8 |
| Mumbai | 3125 | 3420 | 6545 | 52.3 | 47.7 |
| Raigarh | 939 | 2430 | 3369 | 72.1 | 27.9 |
| Pune | 19795 | 7755 | 27551 | 28.1 | 71.9 |
| Ahmadnagar | 17477 | 5683 | 23160 | 24.5 | 75.5 |
| Bid | 7340 | 4001 | 11341 | 35.3 | 64.7 |
| Latur | 3251 | 3924 | 7175 | 54.7 | 45.3 |
| Osmanabad | 5296 | 2417 | 7713 | 31.3 | 68.7 |
| Solapur | 13403 | 5688 | 19091 | 29.8 | 70.2 |
| Satara | 12360 | 0 | 12360 | 0.0 | 100.0 |
| Ratnagiri | neg | 1588 | 1588 | 100.0 | 0.0 |
| Sindhudurg | neg | 993 | 993 | 100.0 | 0.0 |
| Kolhapur | 25456 | 3370 | 28827 | 11.7 | 88.3 |
| Sangli | 16426 | 2796 | 19222 | 14.5 | 85.5 |

Source : Table no . 4.1 and 4.5

Table 4.8. Estimation of Total Missing Girls and contribution of missing due to SSA and due to Excess Female Child Mortality, Maharashtra, 2011

| No. | State/Districts | Missing girls due to SSA= | Missing girls due to excess female child mortality | Total Missing girls | % share of missing girls due to EFCM | % share missing girls due to SSA |
|---|---|---|---|---|---|---|
| | MAHARASHTRA | 392995 | 51040 | 444035 | 11.5 | 88.5 |
| 1 | Nandurbar | 1228 | 994 | 2222 | 44.7 | 55.3 |
| 2 | Dhule | 6663 | 2121 | 8784 | 24.1 | 75.9 |
| 3 | Jalgaon | 28962 | 4014 | 32976 | 12.2 | 87.8 |
| 4 | Buldana | 17073 | 1300 | 18373 | 7.1 | 92.9 |
| 5 | Akola | 4375 | 533 | 4907 | 10.9 | 89.2 |
| 6 | Washim | 7095 | 680 | 7775 | 8.7 | 91.3 |
| 7 | Amravati | 2876 | 1413 | 4289 | 32.9 | 67.1 |
| 8 | Wardha | 2245 | 454 | 2699 | 16.8 | 83.2 |
| 9 | Nagpur | 5405 | 1993 | 7397 | 26.9 | 73.1 |
| 10 | Bhandara | 428 | 470 | 899 | 52.3 | 47.6 |
| 11 | Gondiya | 345 | 378 | 723 | 52.3 | 47.7 |
| 12 | Gadchiroli | 0 | 359 | 359 | 100.0 | 0.0 |
| 13 | Chandrapur | 857 | 524 | 1381 | 37.9 | 62.1 |
| 14 | Yavatmal | 5098 | 1656 | 6754 | 24.5 | 75.5 |
| 15 | Nanded | 9605 | 2411 | 12016 | 20.1 | 79.9 |
| 16 | Hingoli | 5892 | 861 | 6754 | 12.7 | 87.2 |
| 17 | Parbhani | 8663 | 1404 | 10067 | 13.9 | 86.1 |
| 18 | Jalna | 11341 | 2192 | 13533 | 16.2 | 83.8 |
| 19 | Aurangabad | 25045 | 3427 | 28472 | 12.0 | 88.0 |
| 20 | Nashik | 25407 | 4278 | 29685 | 14.4 | 85.6 |
| 21 | Thane | 18528 | 3082 | 21610 | 14.3 | 85.7 |
| 22 | Mumbai (Suburban) | 18751 | 2229 | 20980 | 10.6 | 89.4 |
| 23 | Mumbai | 4868 | 1105 | 5973 | 18.5 | 81.5 |
| 24 | Raigarh | 2917 | 416 | 3333 | 12.5 | 87.5 |
| 25 | Pune | 39256 | 1991 | 41247 | 4.8 | 95.2 |
| 26 | Ahmadnagar | 29203 | 2050 | 31252 | 6.6 | 93.4 |
| 27 | Bid | 26555 | 2094 | 28649 | 7.3 | 92.7 |
| 28 | Latur | 9438 | 1996 | 11434 | 17.5 | 82.5 |
| 29 | Osmanabad | 8881 | 1044 | 9925 | 10.5 | 89.5 |
| 30 | Solapur | 18506 | 2190 | 20695 | 10.6 | 89.4 |
| 31 | Satara | 9247 | 604 | 9851 | 6.1 | 93.9 |
| 32 | Ratnagiri | 1498 | 30 | 1528 | 2.0 | 98.0 |
| 33 | Sindhudurg | 964 | 226 | 1190 | 19.0 | 81.0 |
| 34 | Kolhapur | 19605 | 653 | 20258 | 3.2 | 96.8 |
| 35 | Sangli | 13619 | 691 | 14310 | 4.8 | 95.2 |

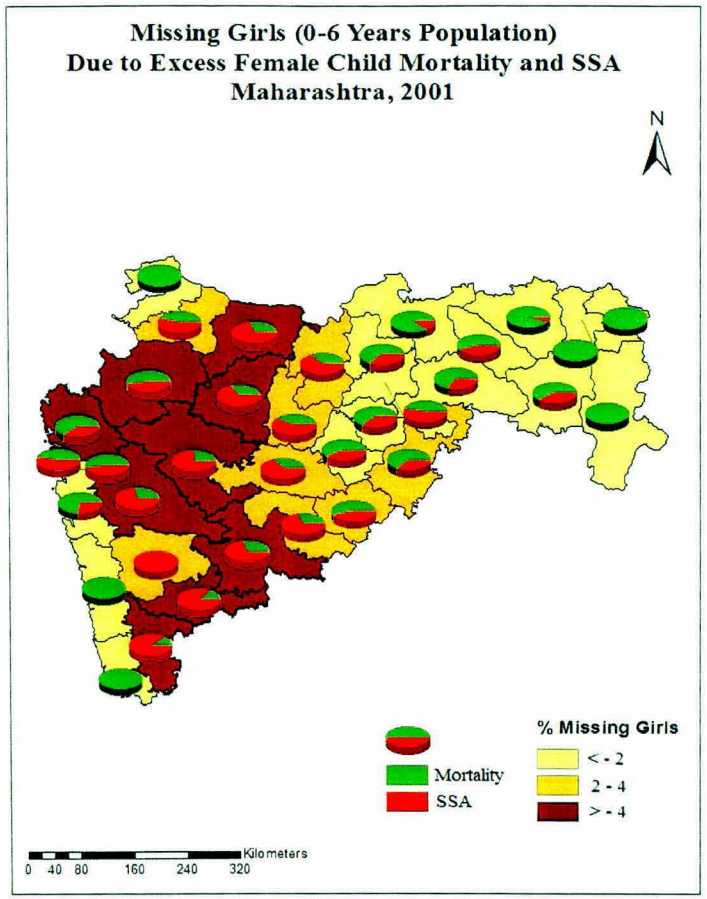
Source: Table no 4.2 and 4.6

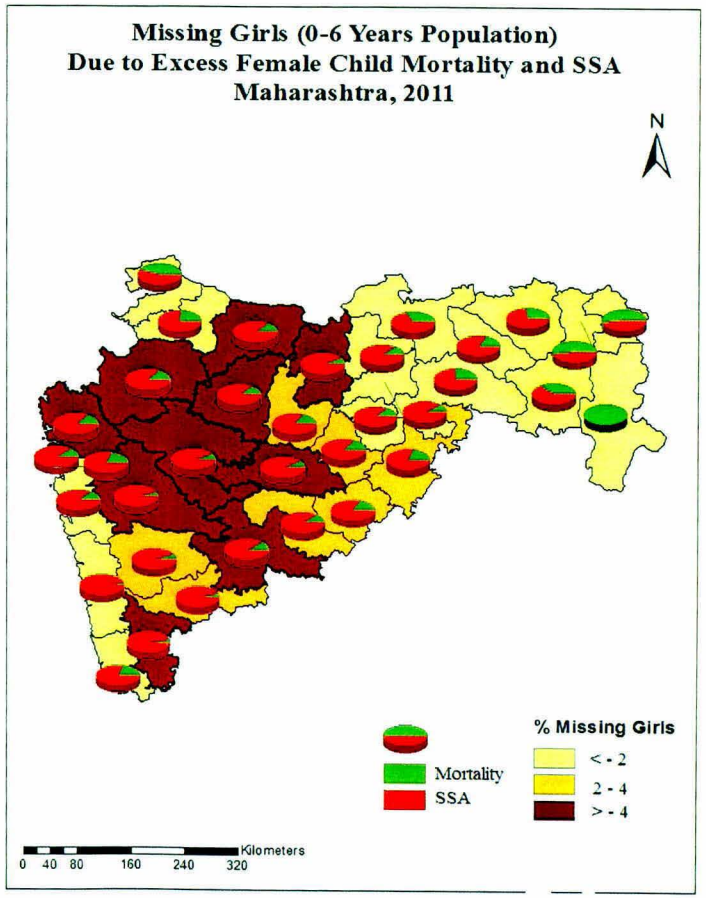
## 4.6 Concluding Remarks

As we mentioned earlier the number of missing girls has increased from census 2001 to 2011, It has increased by 109530 missing girls. This number is huge. Contribution of Excess female child mortality is reduced by the time. But we cannot say the post discrimination against girls has been reduced. When we observe the whole situation we can conclude that postnatal discrimination has been reduced because prenatal discrimination has been increased tremendously (Fig. 4.10). People can now have easy access to prenatal discrimination techniques so they abort female fetus before birth. Excess female fetus abortions are replacing the excess female child mortality.

Analysis of Missing girls has shown the western and eastern divide in pattern of missing girls in the Maharashtra state. Prevalence of SSA was the highest in the western part of Maharashtra in the period of 1994 -2001 but now it has spread to belt of north central and south central districts in the period of 2004-2011(Fig. 4.9). So now we can observe high number of missing girls due to sex selection in the western and central belt of the state and relatively high number of missing girls due to excess female child mortality in eastern region of Maharashtra. The western part is quite developed region by health infrastructure, transport facilities and eastern part which has high share of ST population is always lagged behind in development process which has lack of health infrastructure and lack of good transportation facilities.

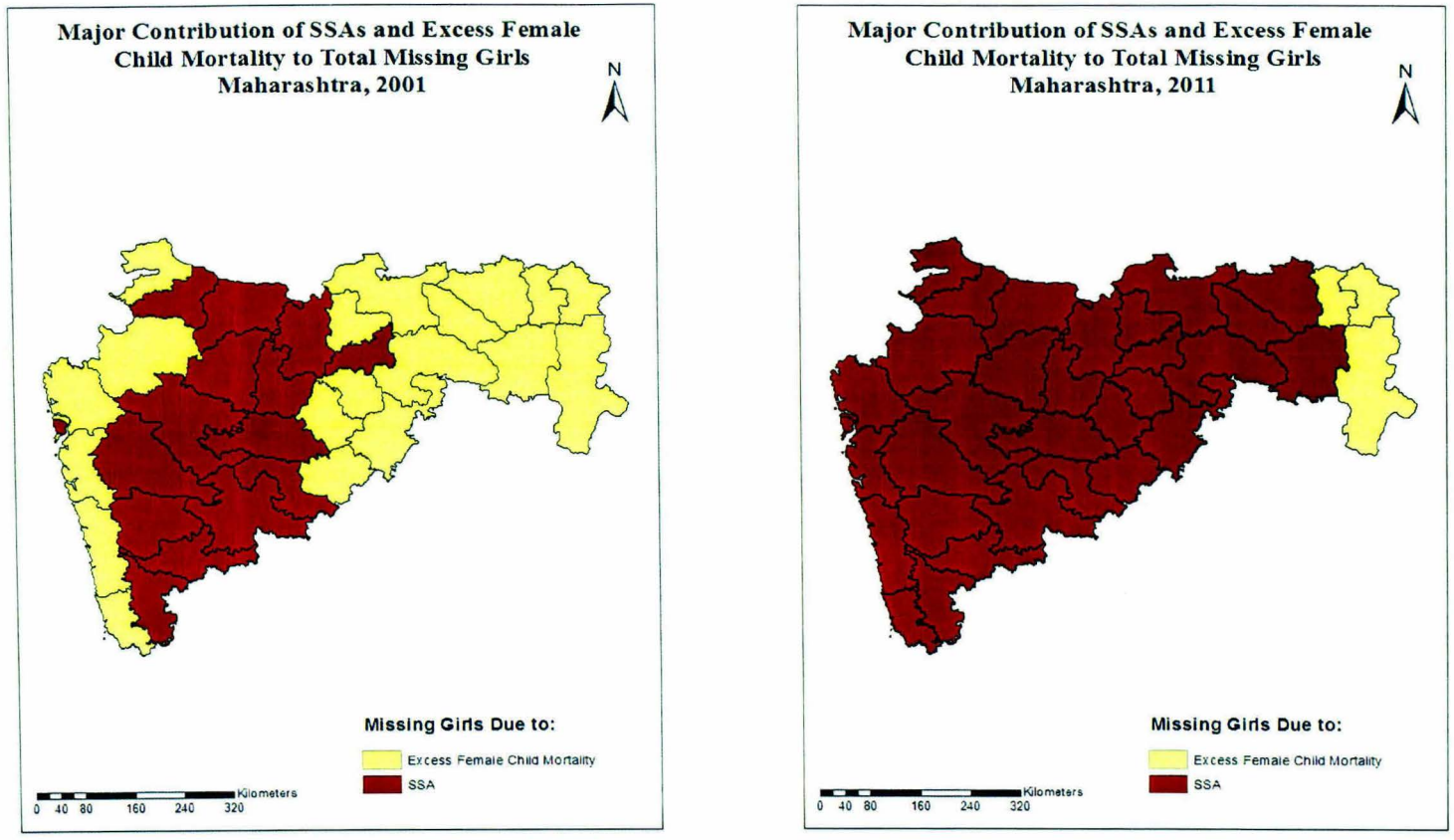
Figure 4.9 Contribution of Missing Girls due to Sex Selection Abortions and Excess Female Child Mortality, Districts of Maharashtra, 2001 and 2011.




Source: Estimated by author.

Figure 4.10 Major Contribution of sex Selective Abortions and Excess Female Child Mortality to total missing girls, 2001 and 2011.




Source: Estimated by author.

Chapter 5

# Child Sex Ratio and Ultrasound Sonography Centres in Maharashtra

## Chapter 5

## Child Sex Ratio and Ultrasound Sonography Centres in Maharashtra

### 5.1 Introduction

The technological advancements in the medical field are likely to be blessings for human life. Technologies like Ultrasound Sonography are really good innovation to examine any complications in human body and it is boon to locate any defects in fetus. But there are many evidences that people are misusing these technologies to determine the sex of the children, and once they detect the sex, and find out it is female, go for abortion to avoid having unwanted girls.

The previous chapter has shown a rise in the practice of sex selective abortions over time. There are 444035 missing girls of ages 0-6 in 2011 of whom 392995 are missing solely due to sex selective abortions. It means 89% of missing girls are on account of SSA and in some districts this percentage is more than 90 %. With this background, it is important to study means of sex selection and their densities across regions in the state. The present Chapter tries to understand the role of ultrasound sonography centres (USCs) in decline of child sex ratio (CSR) in Maharashtra. The study uses the data on CSR from Census of India 2011 and the data on ultrasound Sonography Centres (USCs) supplied by the State Family Welfare Bureau, Government of Maharashtra. Specific objectives of this chapter are to analyze district wise distribution of USCs and importantly, to assess the relationship between number of USCs and CSR at the district level.

## 5.2 Distribution of Ultrasound Sonography Centres (USCs) across districts of Maharashtra

Table.5.1 Number and percent of registered Ultrasound Sonography Centres (USCs) in Maharashtra by Health Circles as on December 2011.

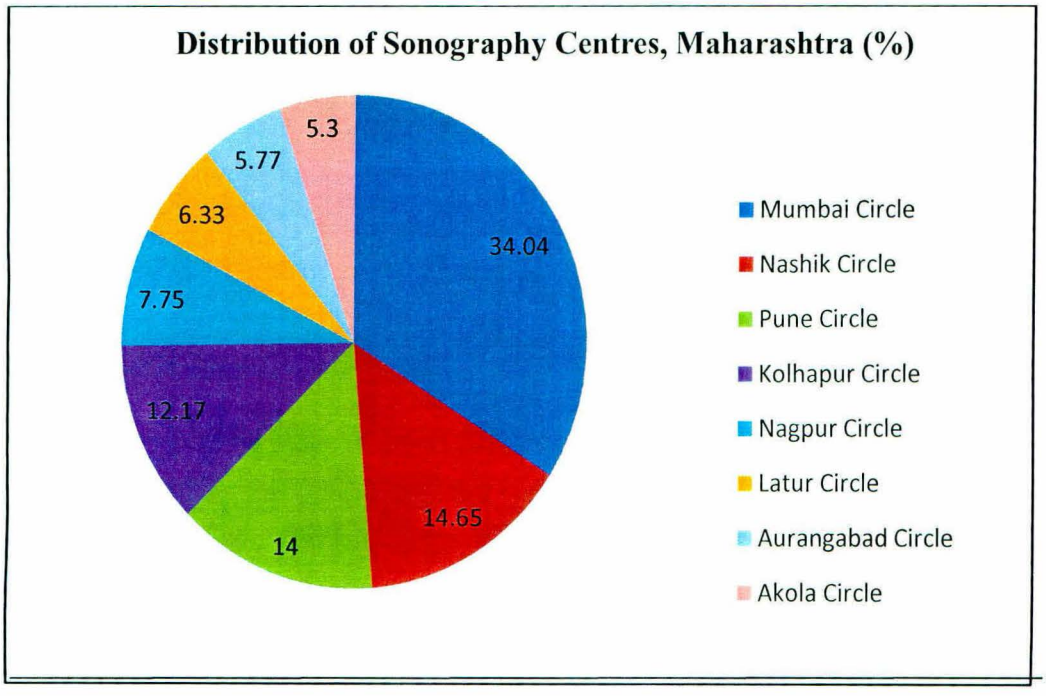
| Circle | No of districts | No of Active Centres | % of centres in a state |
|---|---|---|---|
| Mumbai Circle | 5 | 2314 | 34.04 |
| Nashik Circle | 5 | 996 | 14.65 |
| Pune Circle | 2 | 952 | 14.00 |
| Kolhapur Circle | 4 | 827 | 12.17 |
| Nagpur Circle | 6 | 527 | 7.75 |
| Latur Circle | 4 | 430 | 6.33 |
| Aurangabad Circle | 4 | 392 | 5.77 |
| Akola Circle | 5 | 360 | 5.30 |
| State | 35 | 6798 | 100 |

Source: The Health and Family Welfare Department, Government of Maharashtra, 2011.
Note: A circle is a group of districts.

There were total 6798 active Ultrasound Sonography Centres (on November 2011) in the state according to the report on Implementation of PCPNDT Act, State Family Welfare Department and Government of Maharashtra (GOM, 2011). The information is available for districts and regions called circles with two or more districts. The Mumbai Circle has the largest proportion (34.04%) of total Ultrasound Sonography Centres, around 2314 centres are located in Mumbai and nearby districts of Mumbai circle. The Nashik circle holds second position after Mumbai, having 996 sonography centres which constitute 14.65% of total USCs. Districts of Pune circle have 952 Ultrasound sonography centres, that is 14 % of total sonography centres. More than 60% of state's sonography centres are located in only three regions, Mumbai, Nashik and Pune (Table 5.1).

The Kolhapur circle also has a large number of sonography centres, 827 (12.17 % of total centres). From the data we can conclude that around 75% of total ultrasound centres are located in western and north-western part of Maharashtra where child sex ratios have declined sharply. This prosperous belt is famous for its Sugar factories. Farmers in the region are economically well off due to fertile land and good irrigation. Other circles have relatively fewer centres (Fig. 5.1)

Figure 5.1. Distribution of Sonography centres in Maharashtra, 2011.




Source : Department of Health and Family Welfare, Government of Maharashtra, 2011.

Latur Circle: Latur, Osmanabad, Bid, Nanded (4 Districts)

Aurangabad Circle: Aurangabad, Jalana, Parbhani, Hingoli (4 Districts)

Akola Circle: Akola, Washim, Amravati, Yeotmal, Buldhana, (5 Districts)

Nagpur Circle: Nagpur, Wardha, Bhandara, Gondia, Chandrapur, Gadchiroli (6 Districts)

Nashik Circle: Nashik, Dhule, Nandurbar, Jalgaon, Ahmadnagar (5 Districts)

Pune Circle: Pune, Solapur (2 Districts)

Kolhapur Circle: Kolhapur, Satara, Sangli, Sindhudurg (4 Districts)

Mumbai Circle: Mumbai, Mumbai suburban, Thane, Raigargh, Ratnagiri (4 Districts)

As mentioned above Maharashtra state had 6798 sonography centres in 2011. There are on an average 6 USC's per 100000 population. There were 4.5 sonography centres to serve 100000 population in 2001 and now it has increased to 6. It is observed that the sonography centres in Maharashtra are unevenly distributed in its 35 districts. There are 17 districts which have more than 100 sonography centres (with Mumbai and Mumbai suburban consolidated as one district) and have shown distinctly lower child sex ratio than the districts with less than 100 sonography centres. The Mean child sex ratio for the districts with more than 100 sonography centres is 875 whereas for the districts with less than 100 sonography centres it is 900. This is just rough indication of higher availability of scan centres and low child sex ratio. Thane, Mumbai

(including Mumbai), Pune, Kolhapur, Nagpur, Nashik, are the districts (6 districts) with more than 300 Scan centres.

### 5.3 Change in densities of USCs in a decade of 2001 to 2011

A large number of USCs, 2453, were added in the decade of 2001 to 2011 in Maharashtra. There were 4345 centres in the year 2001 (Nagarajan and Muley, 2005) and 6798 in 2011 (GOM, 2011). Mumbai (including Mumbai suburban) has shown a large increase in the number of USCs; 458 USCs were added from 2001. Mumbai had 833 USCs in 2001 and the number has increased to 1291(the highest number in state). Thane district has shown high increase (277) in the number of USCs after Mumbai followed by Pune and Nashik. Nagpur the second capital of the state of Maharashtra showed huge increase of 187 centres from 190 (2001) to 377 (2011). Raigarh district which is underdeveloped but adjacent to Mumbai has added 130 USCs in the last decade since 2001. Kolhapur from western part has shown large increase (124) in the number of USCs, from 211 in 2001 to 335 in 2011.

Except Sangli and Chandrapur, all other districts of Maharashtra have shown significant increase in the number of USCs . The Sangli and Chandrapur districts have shown decrease in the number of USCs. There might be various reasons for reduced number of USCs some of which are:

1. No radiologist available at USCs
2. Own request from owner to close the USCs.
3. Some USCs might have double registrations.
4. Machines had been closed by approved authorities.
5. Some machines may have received Court orders from the district. (by PCPNDT act)

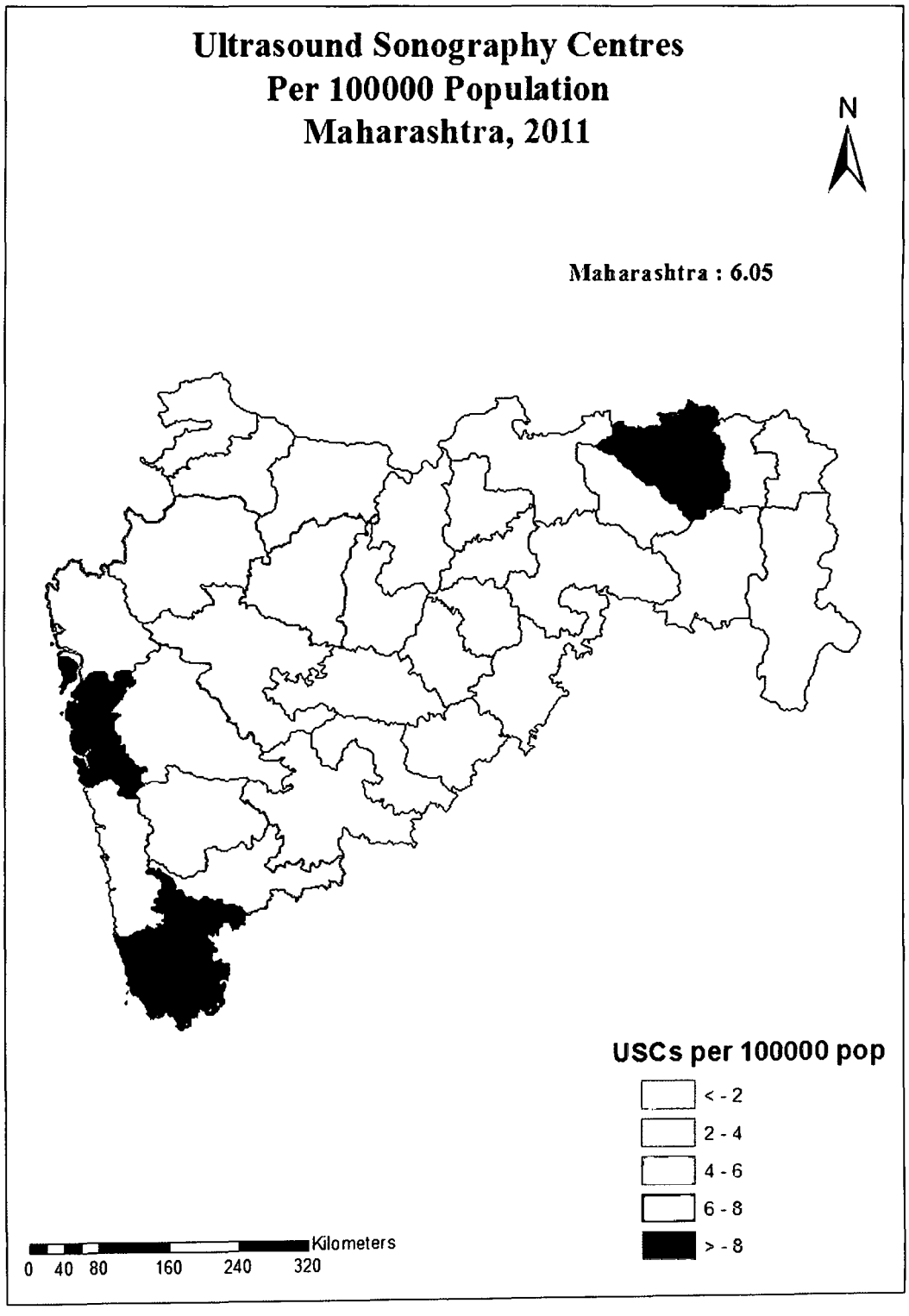
The density of USCs can be computed as the number of USCs per 100000 population. The Maharashtra state had 4.5 USCs per 100000 population in 2001 and that has increased to 6.1 in 2011. As obvious, Proportion of USC per 1000000 populations followed the same trend as the number of USCs (Fig 5.2). The density of USCs has doubled or more than doubled in some districts, some showed less increase and in some districts there was decrease in the density. Sindhudurg had large increase in density from 2001(5.41) to 2011(10.6) and recorded the highest density in 2011. The Districts from western Maharashtra region showed less increase in densities from 2001 to 2011 but central districts of Maharashtra have shown huge increases in USC per 100000 population (Table 5.2).

Table 5.2. Distribution of Ultrasound Sonography Centres (USCs) and Ultrasound Sonography Centres per 100000 populations in districts of Maharashtra, 2001, 2011.

| No. | State/district | No. of USCs in 2001 | No. of USCs in 2011 | USC per 100000 pop in 2001 | USC per 100000 pop in 2011 | Difference in CSR (2011-2001) |
|---|---|---|---|---|---|---|
| | MAHARASHTRA | 4345 | 6798 | 4.49 | 6.05 | -19 |
| 1 | Nandurbar | 15 | 27 | 1.44 | 1.64 | -17 |
| 2 | Dhule | 54 | 98 | 3.16 | 4.78 | -9 |
| 3 | Jalgaon | 163 | 223 | 4.43 | 5.28 | -38 |
| 4 | Buldana | 47 | 67 | 2.11 | 2.59 | -54 |
| 5 | Akola | 64 | 72 | 3.93 | 3.96 | -21 |
| 6 | Washim | 14 | 32 | 1.37 | 2.67 | -55 |
| 7 | Amravati | 76 | 115 | 2.92 | 3.98 | -6 |
| 8 | Wardha | 23 | 37 | 1.86 | 2.85 | -10 |
| 9 | Nagpur | 190 | 377 | 4.67 | 8.1 | -11 |
| 10 | Bhandara | 19 | 28 | 1.67 | 2.34 | -6 |
| 11 | Gondiya | 10 | 48 | 0.83 | 3.63 | -2 |
| 12 | Gadchiroli | 5 | 22 | 0.52 | 2.05 | -4 |
| 13 | Chandrapur | 29 | 15 | 1.4 | 0.68 | 13 |
| 14 | Yavatmal | 37 | 74 | 1.51 | 2.67 | -11 |
| 15 | Nanded | 65 | 132 | 2.26 | 3.93 | -19 |
| 16 | Hingoli | 12 | 24 | 1.22 | 2.04 | -45 |
| 17 | Parbhani | 36 | 49 | 2.36 | 2.67 | -39 |
| 18 | Jalna | 34 | 57 | 2.11 | 2.91 | -33 |
| 19 | Aurangabad | 147 | 262 | 5.07 | 7.09 | -33 |
| 20 | Nashik | 213 | 459 | 4.27 | 7.51 | -30 |
| 21 | Thane | 426 | 703 | 5.24 | 6.36 | -7 |
| 23 | Mumbai | 417 | 1291 | 7.46 | 10.35 | -9 |
| 24 | Raigarh | 106 | 236 | 4.8 | 8.96 | -3 |
| 25 | Pune | 481 | 749 | 6.65 | 7.95 | -19 |
| 26 | Ahmadnagar | 211 | 189 | 5.22 | 4.16 | -32 |
| 27 | Bid | 61 | 114 | 2.82 | 4.41 | -86 |
| 28 | Latur | 67 | 125 | 3.22 | 5.09 | -29 |
| 29 | Osmanabad | 27 | 59 | 1.82 | 3.55 | -27 |
| 30 | Solapur | 174 | 203 | 4.52 | 4.7 | -11 |
| 31 | Satara | 209 | 230 | 7.44 | 7.66 | 17 |
| 32 | Ratnagiri | 56 | 84 | 3.3 | 5.21 | -16 |
| 33 | Sindhudurg | 47 | 90 | 5.41 | 10.6 | -22 |
| 34 | Kolhapur | 211 | 335 | 5.99 | 8.65 | 24 |
| 35 | Sangli | 183 | 172 | 7.08 | 6.1 | 15 |

Source : The Health and Family Welfare Department, Government of Maharashtra, 2011. Nagarajan and Mulay (2005).

Figure 5.2. Ultrasound Sonography Centres (USCs) per 100000 populations in districts of Maharashtra, 2011.




Source : Department of Health and Family Welfare bureau , Government of Maharashtra. Registrar General , 2013.

## 5.4 Relationship with developmental indicators

After having an idea about densities of scan centres across districts, it would be useful to study which developmental factors affect the densities of scan centres. The study has taken percent literate population, level of urbanization, share of ST, share of cultivators, and Per Capita Net Domestic Product as development indicators. Level of urbanization is likely to the increase the availability of scan centres since urban populations are more likely than rural to adopt new technologies. Per Capita Net Domestic Product may increase accessibility to scan centres due to greater purchasing power. We need to see if there is significant relationship between these factors and the density of scan centres.

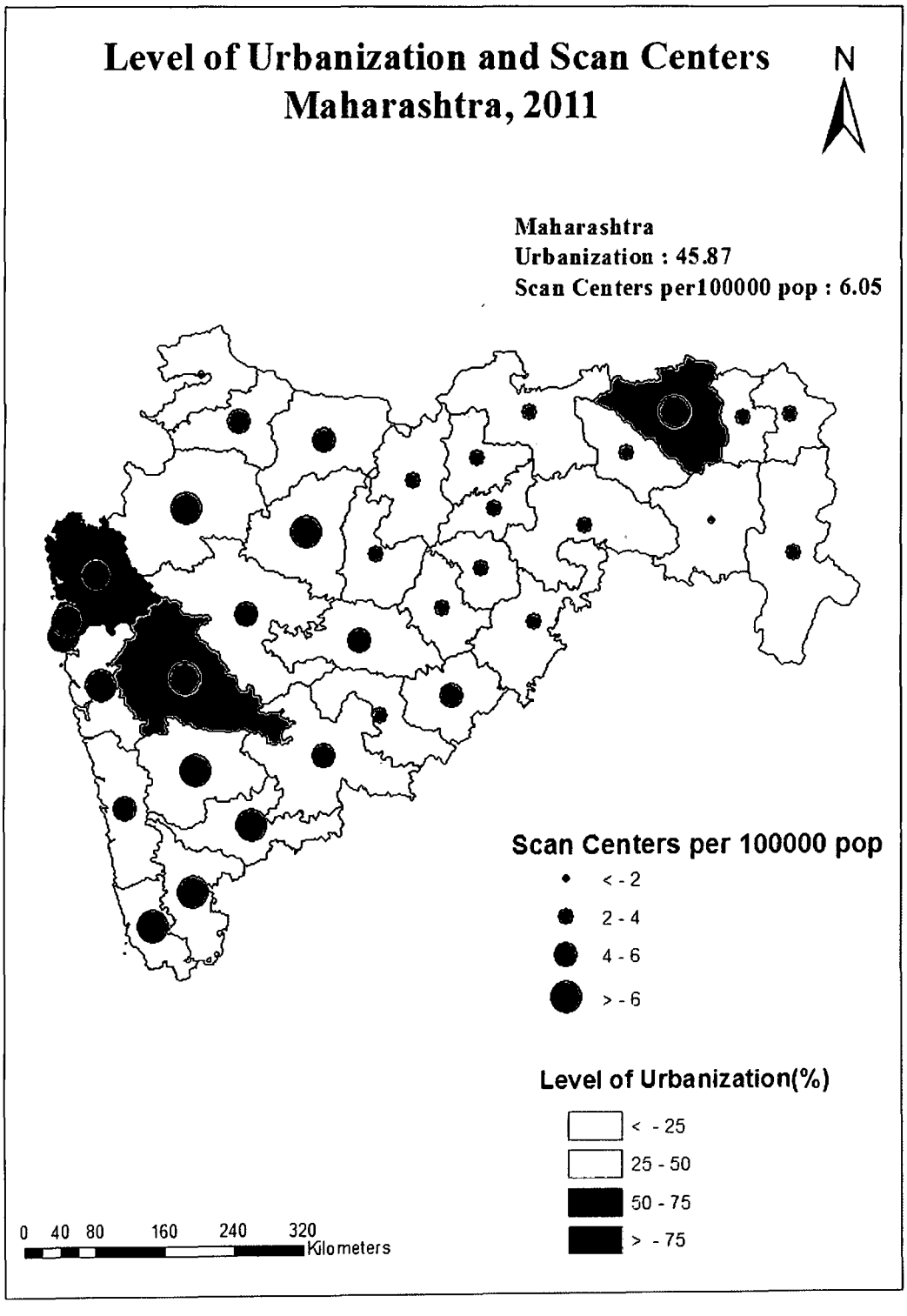
Majority of districts of Maharashtra have high literacy rates (more than 80%) and except the tribal district of Nandurbar all districts have literacy rate above 70%. Mumbai has 10.35 sonography centres per hundred thousand populations with 100 percent urbanization and highest literacy rate (89.7%) in Maharashtra. After that Nagpur, Kolhapur, Raigargh are the districts having about 9 sonography centres per 100 thousand population. Pune, Satara, Nashik, Aurangabad, Thane, Sangli having 6 to 8 sonography centres who serve 100 thousand people in respective districts. Districts of central Maharashtra shows 4 to 5 sonography centres per 100000 populations with significant level of urbanization and literacy (Table 5.3). Here we observed districts with high urbanization and literacy have higher number of sonography centres proportion to population and low CSR. Unexpectedly, Sindhudurg has around 11 sonography centres per 100,000 populations with very low (13 %) urbanization (Fig. 5.3).

Table 5.3 District wise distribution of Scan centres , USC per 100000 pop and development indicators, 2011.

| State/dist | Number of Scan centres | USC per 100,000 pop | CSR | Literacy Rate | Level of Urbanization | Share of ST | Share of cultivators | Per Capita Net domestic Product |
|---|---|---|---|---|---|---|---|---|
| Nandurbar | 27 | 1.64 | 944 | 63.04 | 17.43 | 69.3 | 32.25 | 52923 |
| Dhule | 98 | 4.78 | 898 | 74.61 | 28.01 | 31.6 | 28.17 | 58575 |
| Jalgaon | 223 | 5.28 | 842 | 79.73 | 31.81 | 14.3 | 22.49 | 68900 |
| Buldana | 67 | 2.59 | 855 | 82.09 | 21.13 | 4.8 | 32.76 | 45699 |
| Akola | 72 | 3.96 | 912 | 87.55 | 39.53 | 5.5 | 18.58 | 58627 |
| Washim | 32 | 2.67 | 863 | 81.7 | 17.52 | 6.7 | 31.78 | 52075 |
| Amravati | 115 | 3.98 | 935 | 88.23 | 35.82 | 14 | 19.2 | 63270 |
| Wardha | 37 | 2.85 | 919 | 87.22 | 32.34 | 11.5 | 25.04 | 61391 |
| Nagpur | 377 | 8.1 | 931 | 89.52 | 68.2 | 9.4 | 10.68 | 96458 |
| Bhandara | 28 | 2.34 | 950 | 85.14 | 19.52 | 7.4 | 24.78 | 57094 |
| Gondiya | 48 | 3.63 | 956 | 85.41 | 17.17 | 16.2 | 31.74 | 50042 |
| Gadchiroli | 22 | 2.05 | 961 | 70.55 | 11.07 | 38.7 | 46.07 | 43058 |
| Chandrapur | 15 | 0.68 | 953 | 81.35 | 35.37 | 17.7 | 23.38 | 67641 |
| Yavatmal | 74 | 2.67 | 922 | 80.7 | 21.47 | 18.5 | 27.42 | 63469 |
| Nanded | 132 | 3.93 | 910 | 76.94 | 27.31 | 8.4 | 31.89 | 44978 |
| Hingoli | 24 | 2.04 | 882 | 76.04 | 15.14 | 9.5 | 43.74 | 49470 |
| Parbhani | 49 | 2.67 | 884 | 75.22 | 30.95 | 2.2 | 36.45 | 50716 |
| Jalna | 57 | 2.91 | 870 | 73.61 | 19.23 | 2.2 | 46.14 | 50262 |
| Aurangabad | 262 | 7.09 | 858 | 80.4 | 43.81 | 3.9 | 32.74 | 84295 |
| Nashik | 459 | 7.51 | 890 | 80.96 | 42.86 | 25.6 | 32.14 | 84982 |
| Thane | 703 | 6.36 | 924 | 86.18 | 77.8 | 13.9 | 5.54 | 125562 |
| Mumbai | 1291 | 10.35 | 914 | 89.69 | 100 | 0.95 | 0.26 | 141138 |
| Raigarh | 236 | 8.96 | 935 | 83.89 | 37.87 | 11.6 | 16.3 | 96468 |
| Pune | 749 | 7.95 | 883 | 87.19 | 61.23 | 3.7 | 18.13 | 127176 |
| Ahmadnagar | 189 | 4.16 | 852 | 80.22 | 20.08 | 8.3 | 44.78 | 71054 |
| Bid | 114 | 4.41 | 807 | 73.53 | 19.76 | 1.3 | 48.27 | 52177 |
| Latur | 125 | 5.09 | 889 | 79.03 | 25.43 | 2.3 | 32.22 | 81557 |
| Osmanabad | 59 | 3.55 | 867 | 76.33 | 16.87 | 2.2 | 41.44 | 48887 |
| Solapur | 203 | 4.7 | 883 | 77.72 | 31.84 | 1.8 | 34.88 | 70465 |
| Satara | 230 | 7.66 | 895 | 84.2 | 19.28 | 1 | 43.58 | 67134 |
| Ratnagiri | 84 | 5.21 | 936 | 82.43 | 17.24 | 1.3 | 33.87 | 66921 |
| Sindhudurg | 90 | 10.6 | 922 | 86.54 | 12.96 | 0.8 | 33.96 | 69552 |
| Kolhapur | 335 | 8.65 | 863 | 82.9 | 31.94 | 0.8 | 35.61 | 84095 |
| Sangli | 172 | 6.1 | 867 | 82.62 | 25.53 | 0.6 | 42.24 | 71196 |
| MAHARASHTRA | 6798 | 6.05 | 894 | 82.91 | 45.87 | 9.4 | 23.95 | 87686 |

Source: RG , 2013; The Health and Family Welfare Department, Government of Maharashtra, 2011.; Economic Survey of Maharashtra, 2011-12, Directorate of Economics and Statistics , Planning Dept, GOM, Mumbai.

Figure 5.3. Level of Urbanization and Scan Centers, Maharashtra, 2011




Source : State and Family Welfare Bureau, GOM, 2011; RG 2013.

**Correlation analysis between USC per 100000 population and developmental indicators of district**

Table 5. 4. Correlation between of Scan centres per 100000 population and developmental indicators. 2011

| Variables | SRB | CSR | Literacy Level | Level of Urbanization | Share of ST | Share of cultivators | Per capita Net domestic product |
|---|---|---|---|---|---|---|---|
| Scan Centres per 100000 pop | -0.114 | -0.134 | 0.394** | 0.419** | -0.332 | -0.229 | 0.675*** |

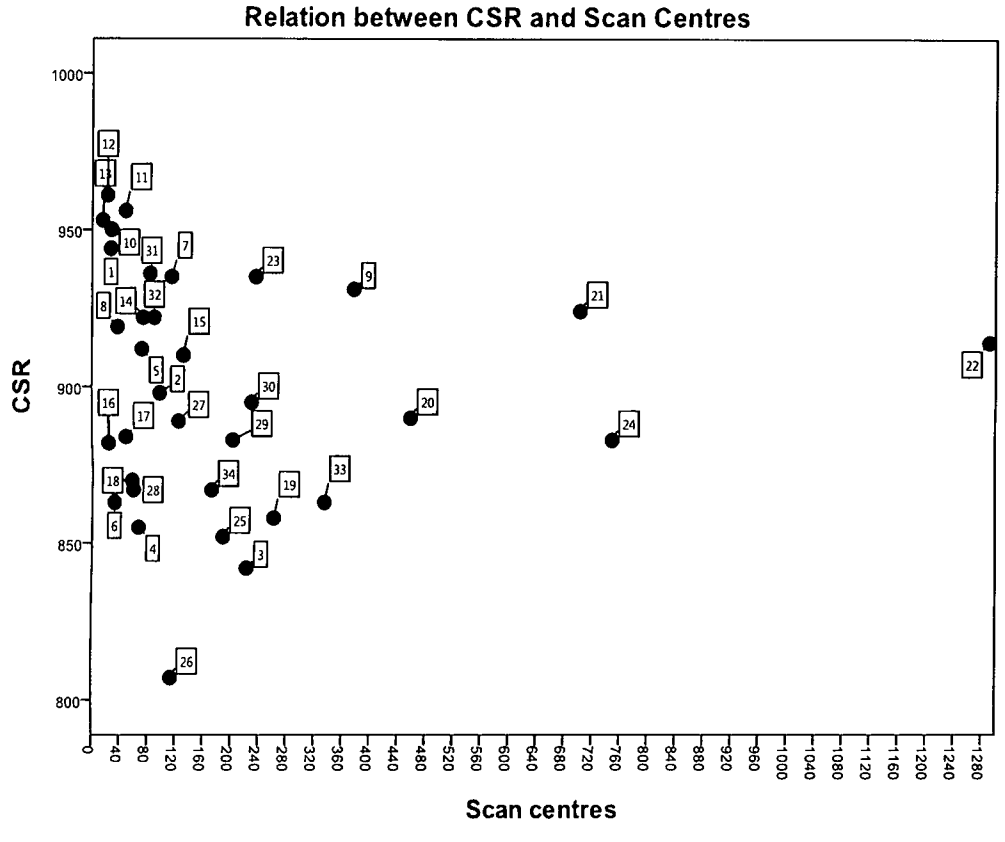
***, **, and *: Correlation is significant at the 1%, 5% and 10% level respectively. (2- tailed)

Note: N=33 as Mumbai and Mumbai suburban areas excluded.

Source : Department of Health and Family Welfare, Government of Maharashtra, 2011.

Correlation analysis has been carried out to see the relationship between USC per 100000 population and other developmental indicators. Mumbai and Mumbai suburban districts are not included in this analysis since these are entirely urban and are thus outliers. The analysis shows that literacy level and level of urbanization are positively correlated with USC per 100000 populations (Table 5.4). Per Capita Net Domestic Product has shown high positive correlation with USC per thousand populations. So areas which have rich population, have strongly higher chances of concentration of USCs. Correlations are not significant between share of ST and USC per 100000 pop. It is noteworthy that SRB and CSR have shown insignificant correlation with USC per 100000 populations. This result is rather unexpected as it was felt that since scan centres are required for sex selection, the density of scan centres would be positively associated with sex selective abortions and thus negatively with CSR.

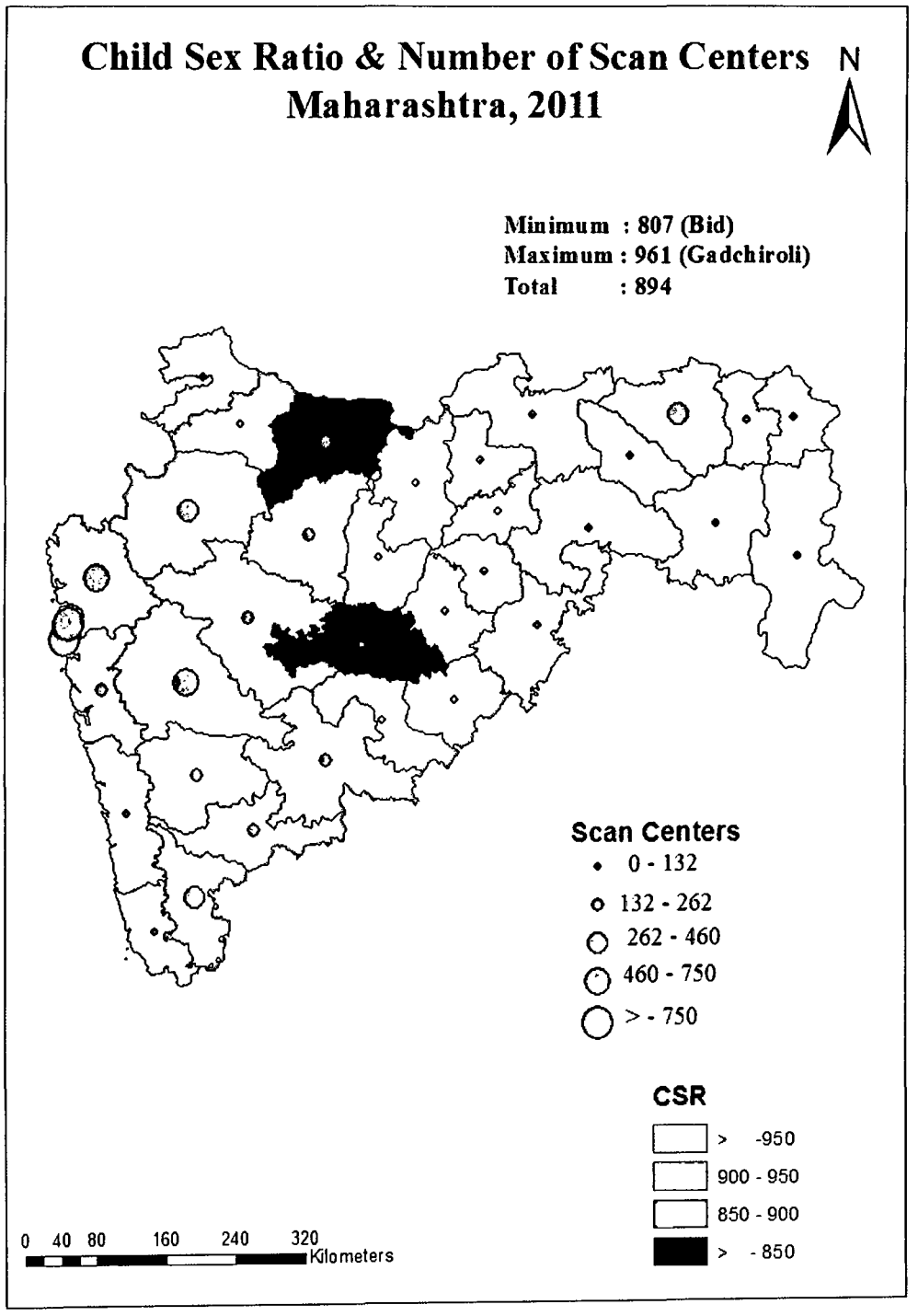
Figure 5.4. Relationship between CSR and Sonography Centres, Districts of Maharashtra, 2011.




Source : Department of Health and Family Welfare, Government of Maharashtra, 2011.

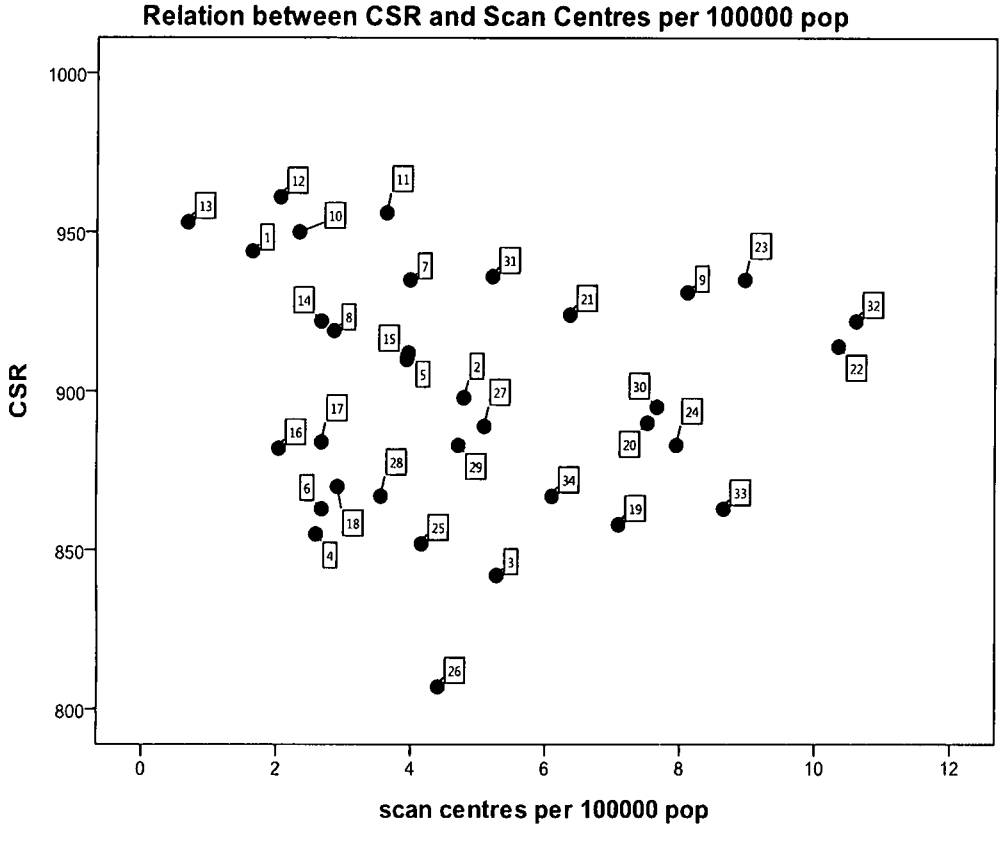
In order to explore this further, a scatter diagram of CSR and scan centre is presented in Figure. 5.4. Mumbai district (with Mumbai Suburban consolidated) is an outlier. It recorded CSR (913) with the highest number of scan centres (1291) and CSR of 913. Thane, Pune districts have also shown different pattern than any other districts of Maharashtra. They showed high number of sonography centres and relatively low CSR. Bid is also placed in extreme points by CSR. Bid has low CSR (807) and medium number of 114 scan centres followed by Jalgaon which showed CSR of 842 and 223 Scan centres. Nagpur, Nashik and Kolhapur are developed districts which have high number of Scan centres (around 400) and lower child sex ratios, interestingly Satara district of Maharashtra which is small by size and population but showed high number of scan centres (230) and CSR below 895 (Fig. 5.5). Latur, Bid and Ahmadnagar, Nanded, Amravati (Central Part of Maharashtra ) showed significant number of Sonography centres and CSR below 940. All other districts of Maharashtra showed very small proportion of scan centres (Below 100) and relatively higher figure of CSR ( like Gadchiroli, Bhandara). But some of the districts like Parbhani, Jalana , Buldhana have small number of scan centres and CSR figure also is very small. So here one cannot confirm any particular pattern of relationship (Fig. 5.4).

Figure 5.5. Child Sex Ratio and Number of Scan Centers in districts of Maharashtra, 2011.




Source : State and Family Welfare Bureau, GOM, 2011, RG 2013.

Figure 5.6. Relationship between CSR and Scan Centres per 100000 population, districts of Maharashtra, 2011.

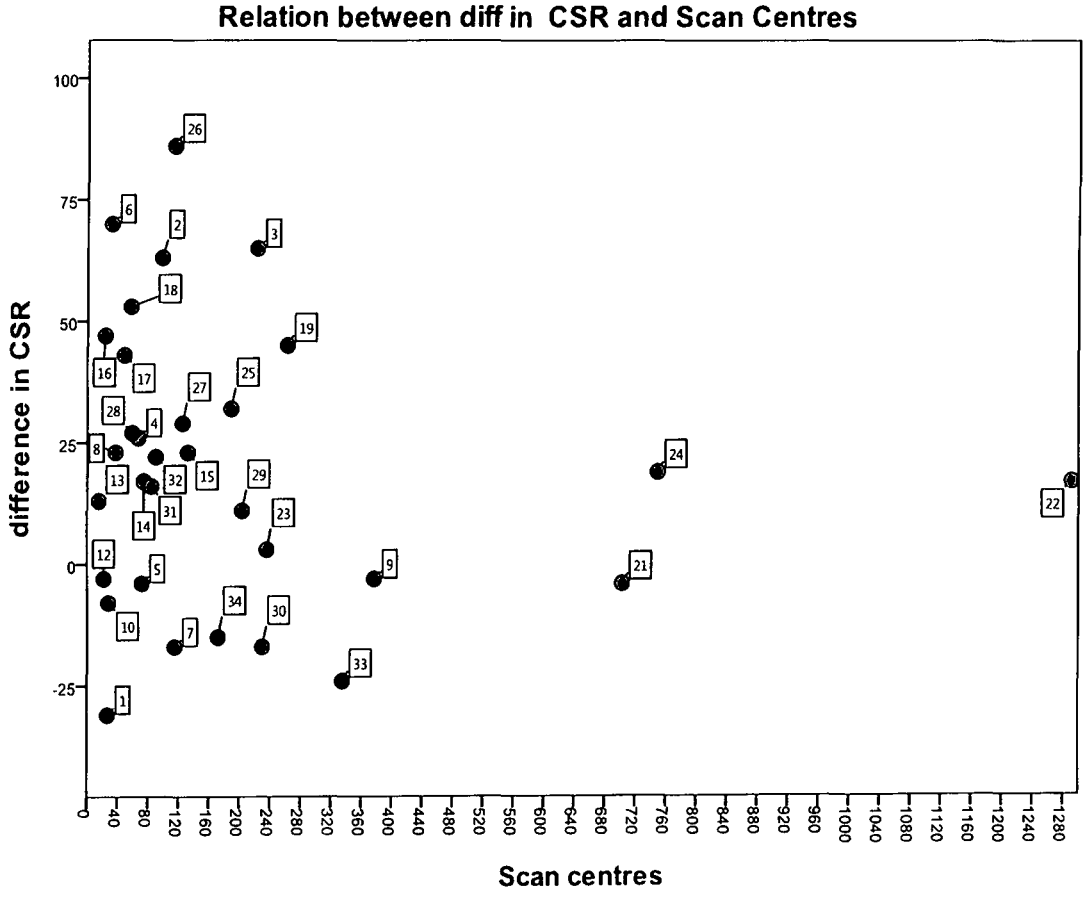



Source: Department of Health and Family Welfare, Government of Maharashtra, 2011.

As the number of scan centres in district does not give a clear picture, we tried to look at scan centres proportionate to population (or density of scan centres) (Fig 5.6). Mumbai district undoubtedly showed one of the highest proportions of scan centres per hundred thousand population (10.35) and low CSR (914). Surprisingly, Sindhudurg district has shown the highest proportion of scan centres (11) per hundred thousand population and recorded CSR of 922. Mumbai and Sindhudurg were outliers in scatter diagram. Sugarcane belt of western Maharashtra has high proportions of Scan centres per 100000 populations (6 to 8 per 100000 populations) and child sex ratio figure lies around 900 or less than that. Nagpur District has higher proportion after western part. (8 per 1000000 pop) and CSR of 931. Bid, Jalgaon and Ahmadnagar districts have around 5 sonography centres per 100000 population but their CSR has fallen below 850.

Here other external factors may play a role to pull down CSR. Therefore, one comes to the conclusion that densities of Scan centres do not determine the CSR. It is perhaps one of the factors contributing to distortion of CSR but not primarily (Fig 5.6).

Figure 5.7. Relationship between Changes in CSR and Scan Centres, districts of Maharashtra, 2001-2011.

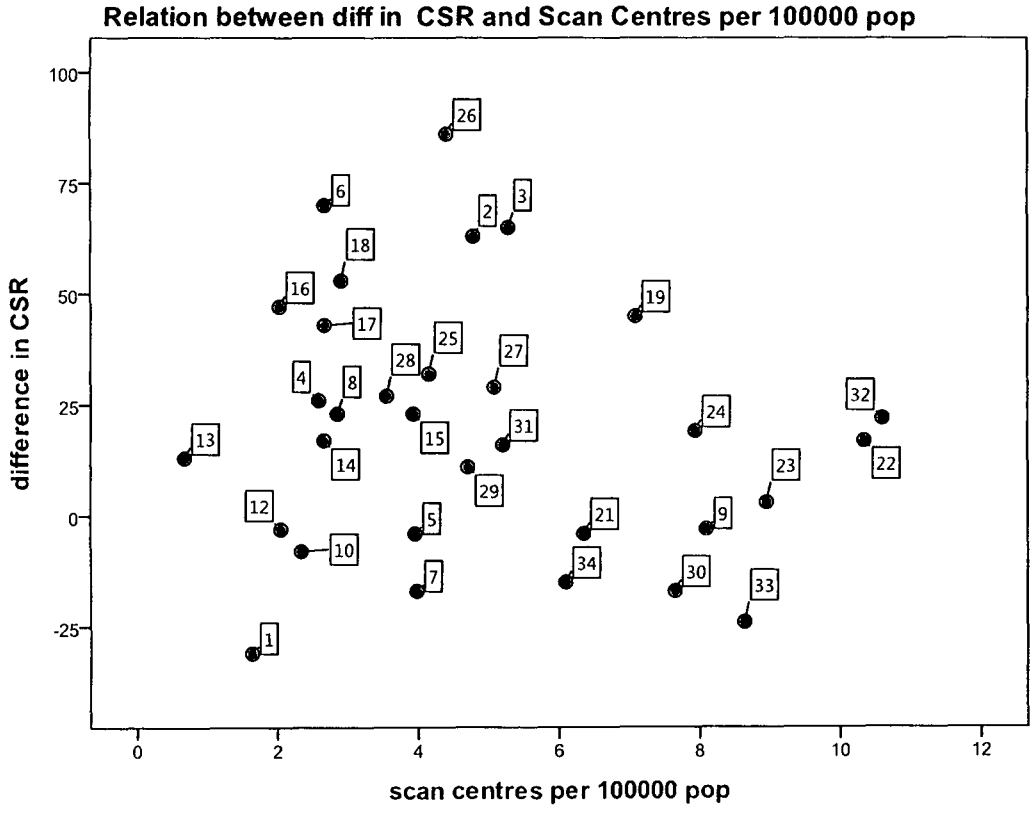



Source: Department of Health and Family Welfare, Government of Maharashtra, 2011.

As we discussed in earlier chapter the CSR has increased from Census 2001 to Census 2011. Surprisingly districts covered by western Maharashtra border have shown large difference in CSR over a decade than rest of Maharashtra irrespective of number of scan centres and proportion of scan centres per 100000 populations (Fig.5.7). One of alternative explanations might be that CSR of Western Maharashtra was already low than some districts from central Maharashtra. Densities of scan centres were also high in western region and now technology and

behavioral changes are spreading over regions. Bid has shown the highest difference in CSR (86 points from census 2001 but density (114) and proportion (4.41) is significantly low in Bid compared to other districts. Districts like Hingoli, Parbhani, Jalana and Jalgaon, Buldhana, Akola, Washim have shown large difference in CSR but had small number of scan centres and even smaller proportions of scan centres. Districts like Kolhapur and Sangli have showed improvement in scan centres even though there was higher density and proportion of scan centres. Here also we cannot confirm the nature of relationship properly (Fig. 5.7).

Figure 5.8. Relationship between Differences in CSR and scan centres per hundred thousand Populations, in districts of Maharashtra, 2001-2011.




Source : Department of Health and Family Welfare, Government of Maharashtra, 2011.

As in earlier results, we do not see any pattern with respect to relation between Difference In CSR and scan centres per hundred thousand population. Western Maharashtra districts like Satara, Sangli, and Kolhapur have high proportion of scan centres per 1000000 populations (6 to

8.5) and decline in CSR up to -25 points. But if see the situation in northern border districts Amravati (4) and Nandurbar (1.8) , proportion is very low but still difference in CSR is quite high about -25 points (Fig 5.8). If we see the case of Sindhudurg district (Western Konkan part) the proportion is high (11%) but there is significant increase in the value of CSR (around 22 points increase). So the pattern does not give scope for concrete conclusion. There is no significant relation between these two.

**Regression analysis between USC per 100000 population and developmental indicators of district**

By correlation analysis we got to know the association between CSR and developmental indicators. Now it is important to see net effect of each independent variable on CSR to get a clear understanding of roles of each predictor variable and their contribution with special inclusion of variable USC per 100000 population (for variation in CSR).

Table 5.5. Regression analysis of CSR on developmental indicators including USCs per 100000 populations, districts of Maharashtra 2011.

| Dependent Variable | Independent Variable | Regression coefficient | t | p |
|---|---|---|---|---|
| CSR | Literacy level | 2.123 | 1.409 | .170 |
| | Level of Urbanization | -1.060* | -1.800 | .083 |
| | Share of ST population | 1.346** | 2.657 | 0.013 |
| | Share of cultivators | -2.055** | -2.089 | .046 |
| | USCs per 100000 pop | -.581 | -.228 | .821 |
| | Constant | 811.05 | | |

| | | | |
|---|---|---|---|
| R= .704 | $R^2$ = .496 | Adj $R^2$ = .402 | n= 33 |

N=33 excluding Mumbai and Mumbai Suburban

***, **, and *: Correlation is significant at the 1%, 5% and 10% level respectively. (2- tailed)

Source: Department of Health and Family Welfare, Government of Maharashtra, 2011.

Of the inter district variation in CSR , 40 % (Adj $R^2$ = .402) is explained by development indicators like literacy level, level of Urbanization, Share of ST population, Share of Cultivators and USCs per 100000 population. Out of these, relationship between literacy level, level of Urbanization, Share of ST population, and Share of Cultivators with CSR , followed the same pattern of relationship as we have seen in chapter 3 (table 3.13). So here we focus more on relationship between CSR and USCs per 100000 populations.

Certainly the analysis didn't find strong relation between Scan centres and CSR controlling for other development indicators (Table 5.5). After some point higher number of scan centres does not matter much to CSR as there are already enough scan centres to serve the purpose of the population including sex selection. So after some point higher number of scan centres may not decrease the child sex ratio. There may be other factors which influence the reduction in CSR than density of scan centres. Correlation and linear regression showed very low value of negative association with insignificant results in 2011. An earlier study conducted by Government of Maharashtra with technical support from Gokhale Institute of politics and Economics showed negative correlation (-0.312**) between CSR and Sonography Centres significant at 5 percent level. Correlation was higher in CSR and scan centres per 100000 population and CSR (-0. 520***) (Nagarajan and Mulay, 2005). In another study on Mumbai found negative relationship between number of scan centres and Child Sex Ratio was found (Kulkarni, 1986).

Kulkarni *et.al* (2009) studied the relationship between USCs and SRB in Uttar Pradesh. No clear relationship between the density of scan centers and child sex ratio was found, but the sex ratio was related to certain development factors. These findings are similar to those in the present investigation.

### 5.6 Concluding Remarks

The increase and spread of number of USCs in districts of Maharashtra is huge over the decade of 2001to 2011.As obvious, proportion of USCs per 100000 population has shown same trend by default. Districts of western Maharashtra have shown the higher proportion of USCs per 100000

populations than rest of the Maharashtra. Concentration of USCs is also unevenly distributed by the region. This has larger impact on the pattern of number of missing girls due to SSA in the state and on proportion of missing girls due to SSA to total missing girls. All the districts from western Maharashtra have shown significantly higher proportion of share of missing girls due to SSA, the reason is a higher distribution of scan centres to support the patriarchal culture.

Ultrasound Sonography Machines are widely used by urban population for various diagnoses just not for sex selection. An educated and rich population in urban areas is more likely to access the medical facilities, so even if the number of USCs increases, that is to serve the other diagnoses not primarily and solely for sex selection purposes. Eventually after certain number of scan centres in the district, further increase in number of scan centres is not likely to affect the current child sex ratios.'

# Chapter 6

# The "Nakusa Programme" in Satara District

# Chapter 6

# The "Nakusa Programme" in Satara District

## 6.1 The "Nakushi/Nakusa Program" in "Satara" District of Maharashtra

Maharashtra is the first state to initiate PCPNDT act in India. But still Maharashtra has been struggling with a declining child sex ratio and is ranked among the five worst states in the country. The reasons are the same as elsewhere: preference for a male child. But in a shocking indicator of how extreme this desire is and how deep-rooted the bias against the girl child can get, scores of families across Maharashtra have simply named their daughters 'Nakushi' or 'Nakusha'—meaning 'unwanted' in Marathi.

In order to check this socially undesirable practice, some steps were taken by Satara district. The district administration of Satara identified 262 such girls under the age of 20 and either renamed them or gave them the option of picking a new name for themselves in year 2011.

District officials and activists say the practice of villagers naming girls 'Nakushi/Nakusa ' was discovered last year and blamed it on a mix of frustration and ignorance. Mothers of "Nakushis" said it was a popular belief in these parts that if their girl was named Nakushi, their next-born would be a boy.

Parents of such girls were usually poor and could not afford the technology that the rich used to illegally determine the sex of the foetus. There are two issues here. One has to realize that the parents did not abort the child through sex selection and detection. They expressed their frustration by naming her 'Nakushi'. So the district administration hoped to spread awareness about girls and make them feel wanted by this program. It was felt that a new name will make a big difference to their lives. Health department is also taking steps to improve the sex ratio.

## 6.2 The "Nakushi/ Nakusa" Program Implementation

The researcher met various officers in the district to learn about the implementation of the Nakushi program. This included those from the health department that was primary responsible for the implementation but also from other related departments. Various aspects of implementation as ascertained from these meetings are described here.

The District Health Officer (DHO) who came up with the idea for renaming said that Satara's health situation is better compared to other districts of the state but the only area it lags behind is the child sex ratio of 895 females for every 1,000 males.

For the last two years, administration has been promoting awareness programmes to protect the girl child and renaming of these girls will be one of the prominent projects. He moreover told the girls came from extremely poor families. "Nakusa" is a very negative name as far as female discrimination is concerned. "Many of the parents were also illiterate," he said and continued "We want to see the changes that come about in these girls after being given a name. Imagine their plight when they grow up and find they have no name. So health officials launched a drive to identify more girls called by this name and have so far found cases in almost all tehsils".

The whole programme was run by the Health department of Satara 'Zilha Parishad' ( District Health Department). The budget was 2 lakh from welfare programs funds. The Health Department has combined this renaming ceremony with Anandibai Joshi Award ceremony to reduce costs of arranging ceremony again.

With the aim of ending this practice and accepting girls as equal to boys, district officials have organized a public renaming ceremony which was attended by Mrs. Supriya Sule, Menber of Parliament and Nationalist Congress Party leader, the state health minister, and other VIPs.

The 265 girls — wearing their best outfits with barrettes, braids and bows in their hair — lined up to receive certificates with their new names along with small flower bouquets from Satara district officials in Maharashtra state. The day was also marked by a procession with young girls dressed as some of India's women achievers including President Pratibha Patil, badminton player Saina Nehwal, the late Indian-born American astronaut Kalpana Chawla, and the late Prime Minister Indira Gandhi.

The District Extension and Media Officer (DEMO) was the key person in organizing this programme. He has doe all the management and arrangements of the program. He informed that the "Nakusa" survey was stared from March 2011 in 71 PHCs and 400 sub centres of Satara district.Nearly 400 ANMs( Auxiliary Nurse Midwife) and 400 MPWs ( Multi Purpose Workers) had been involved in survey. Girls of age below 18 are included in study. Older girls were difficult to catch because of marriage migration. Survey data has been cross checked.

The programme of changing names started with two girls in Saigaon PHC on 17 August 2011. Girls were awarded new names by Vedantika Raje Bhosale (a prominent personality from the erstwhile ruling family).Then on 12th October 2011, names of 64 girls were changed in the presence of National PCPNDT team (Delhi). Dr. Kousallya , the Chairman of national committee of PCPNDT act was present at that time. A big ceremony was conducted on 22th October in the presence of Supriyatai Sule (Member of the Parliament), when the district administration changed names of 199 girls in presence of *Aashas* and *Anganwadi* workers who identified these girls. Around 5000 people were present for this ceremony for social cause.

The district administration has provided name change certificates to girls who are below class 10th as name change was easy for those girls. But girls above class 10th (who have already got their leaving certificate from school) had to file an Affidavit of name change which has to be produced by parents. The administration still has to approach the regional office for gazette notification (of name change). There is no evidence of further follow up on this issue.

Before the programme is examined, it is desirable to see the context. In particular, the physical conditions, historical background and development indicators in the district are described below.

### 6.3 Background of Satara District

The Satara district is situated in western part in Maharashtra state. Satara occupies an area of 10,490 sq.km. with 15 towns and 1739 villages and a population of 30, 03,741 population of which 19.28 % were urban (Census 2011). Satara district consists of four subdivisions namely Satara, Wai, Karad and Phaltan, divided into eleven talukas (tahsils). These are Satara, Karad, Wai, Mahableshwar, Phaltan, Man, Khatav, Koregoan, Patan, Jaoli, Khandala covering 1739 villages.

This district is confined by Pune district to north, Solapur district to east, Sangli district to south and Ratnagiri district and Raigarh districts to west. Satara district has typical landscapes due to variations in relief, climate and vegetation. The variation of relief ranges from the pinnacles and high plateau of the main 'Sahyadri' range having heights over 1200 meters above mean sea level to the subdued basin of 'Nira' river with an average height of about 600 meters above mean sea level. The climate ranges from the rainiest in the Mahabaleshwar region which has an average annual rainfall of over 6000 mm to the driest in Man, Phaltan, Khandala and Khatav tahsils where the average annual rainfall is about 500 mm. Satara is predominately a rural district of the inhabited places in the district. Population growth of the district is high (Barkade, 2012).

Satara has a long history and was the capital of Maratha Kingdom which was spread over 14 lakh square kilometers. This land has rich heritage. Several great warriors, kings, saints, and great personalities made an impact on the history of Maharashtra. Satara is known as a district of warriors and freedom fighters. Proportion of SC and ST is quite low. District is very good in agriculture and comes in sugar and milk belt of western Maharashtra. District has large proportion of wealthy Maratha agriculture families who are politically powerful. The district has concentration of milk and sugar factories. Their contribution is significant in district economy along with agriculture. Wheat and sugarcane production is quite good in the district. Kaas is one of the world heritage sites included by UNESCO. Satara attracts tourists because of hills station Mahableshwar and Panchgani and religious place Wai, which has lots of temples.

The population of Satara district is constantly changing. These population changes represent peoples' adjustment to economic development, opportunities of employment, development of educational facilities and agricultural development, Sugarcane industries are concentrated in Karad, Satara and Koregaon tehsils and Satara and Karad have some engineering industries. (Barkade, 2011)

### 6.4 Developmental Indicators

According to the 2011 census, Satara has 82.8% literacy rate of population with around 19% level of urbanization. Proportion of SC is relatively low (only 11%) and of ST population is negligible. Share of cultivators among total workers is quite high. It has good irrigation level too (31%) which is above the Maharashtra state's level (18%).But Satara has below average income

compared to the state 67, 143 Rs. per capita net domestic product, which is lower than Maharashtra State (87, 686).

**Table. 6.1 Level of literacy and share of SC population in tehsils of Satara, 2001.**

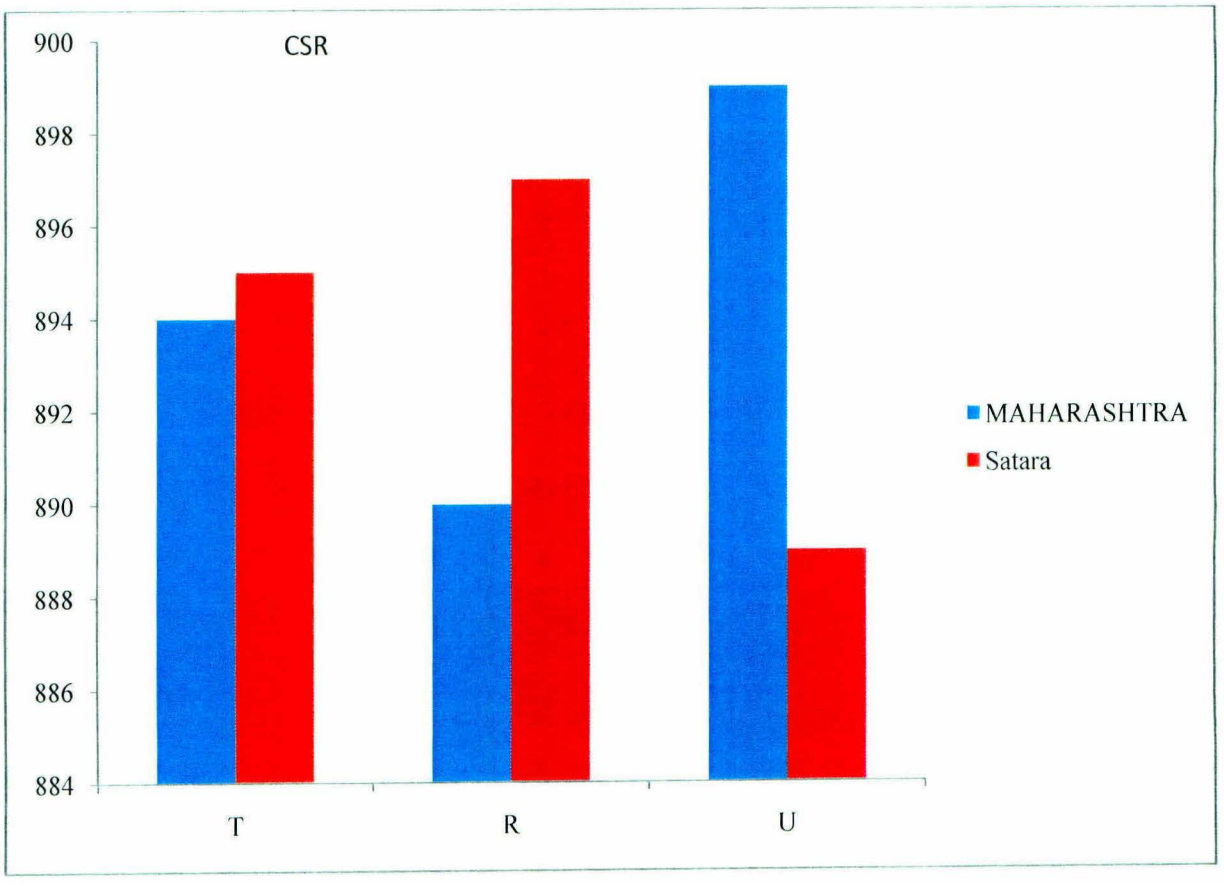
| | Tehsil | Level of literacy | Percentage share of SC population |
|---|---|---|---|
| 1 | Mahabaleshwar | 84.6 | 5.5 |
| 2 | Wai | 79.9 | 6.2 |
| 3 | Khandala | 79.9 | 7.2 |
| 4 | Phaltan | 75.8 | 13.8 |
| 5 | Man | 68.8 | 11.4 |
| 6 | Khatav | 77.1 | 8.3 |
| 7 | Koregaon | 81.3 | 7.4 |
| 8 | Satara | 84.5 | 9.1 |
| 9 | Jaoli | 75.7 | 3.3 |
| 10 | Patan | 72.3 | 6.0 |
| 11 | Karad | 79.0 | 9.8 |
| | Satara dist. | 78.2 | 8.8 |

Source: Census Reports, 2001

Satara district as a whole had 78.2 % literacy rate by census 2001. Literacy rates of Satara district are quite good because of presence of 'Rayat Shikshan Sanstha'. It is an educational organization founded by Karmaveer Bhaurao Patil in 1919. Its aim was to provide education to students who, due to caste, religion of economic status, had not previously had the opportunity. The organization has its headquarters in Satara. The first school, which was on the "Earn & Learn" concept, was started at a village named Kale from Karad tehsil of Satara. But still in comparison with all the tehsils of Satara district Man tehsil had the lowest literacy rate of 68.8% followed by Patan (72.3%). Phaltan and Jaoli tehsils also had literacy around about 75%. Share of SC is also high in Phaltan and Man tehsils.

## 6.5 Child Sex Ratio in Satara district

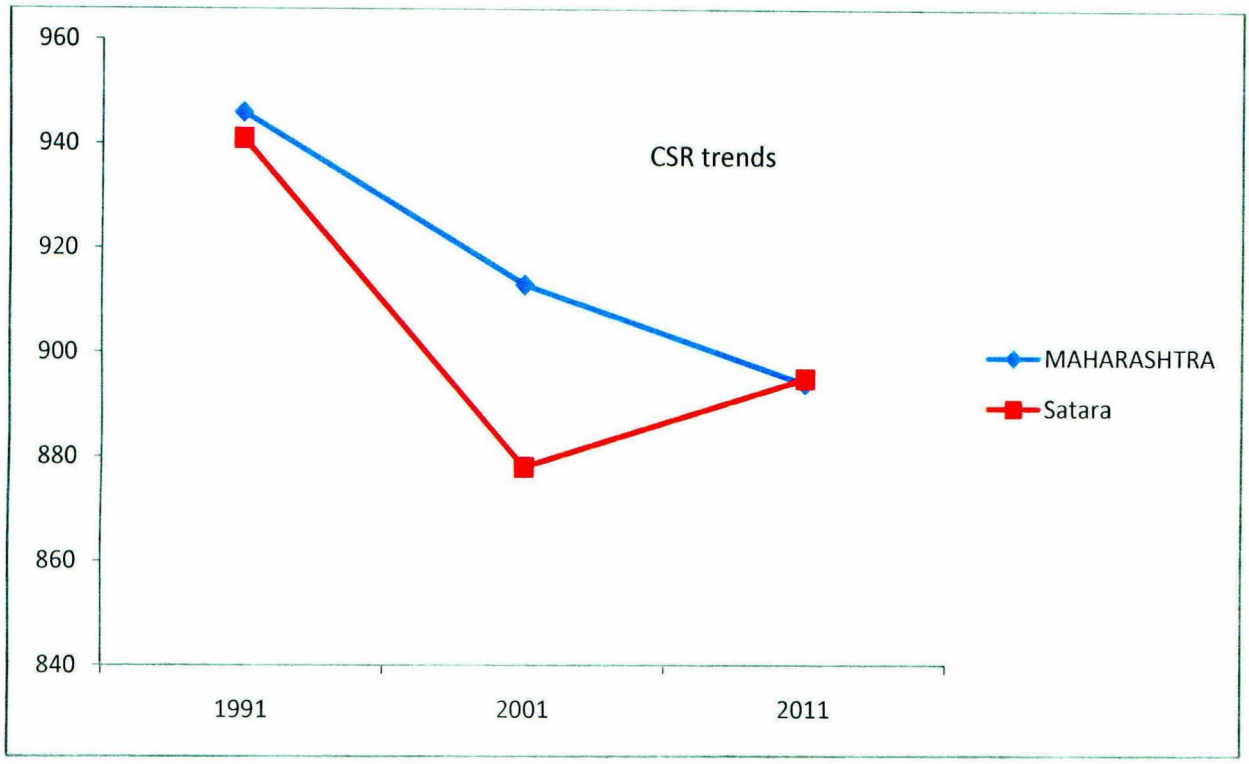
**Fig. 6.1 Rural and Urban Child Sex Ratios of Maharashtra and Satara district, Census of 2011**




Source : Registrar General, 2013.

Census 2011 reveled CSR of Maharashtra 894 and Satara 895, almost the same level of girls per thousand boys. Rural CSR of Maharashtra is 890 and for Satara (rural) , it is 897. Urban Maharashtra has CSR of 899 and Urban Satara has 889. Here we can see that Rural CSR is lower than Urban CSR for both the state and Satara district. Gap between CSR of Urban areas is larger than difference in rural areas. But as mentioned in Chapter 3, Child sex ratio is less than 900 for both for the state and Satara district.

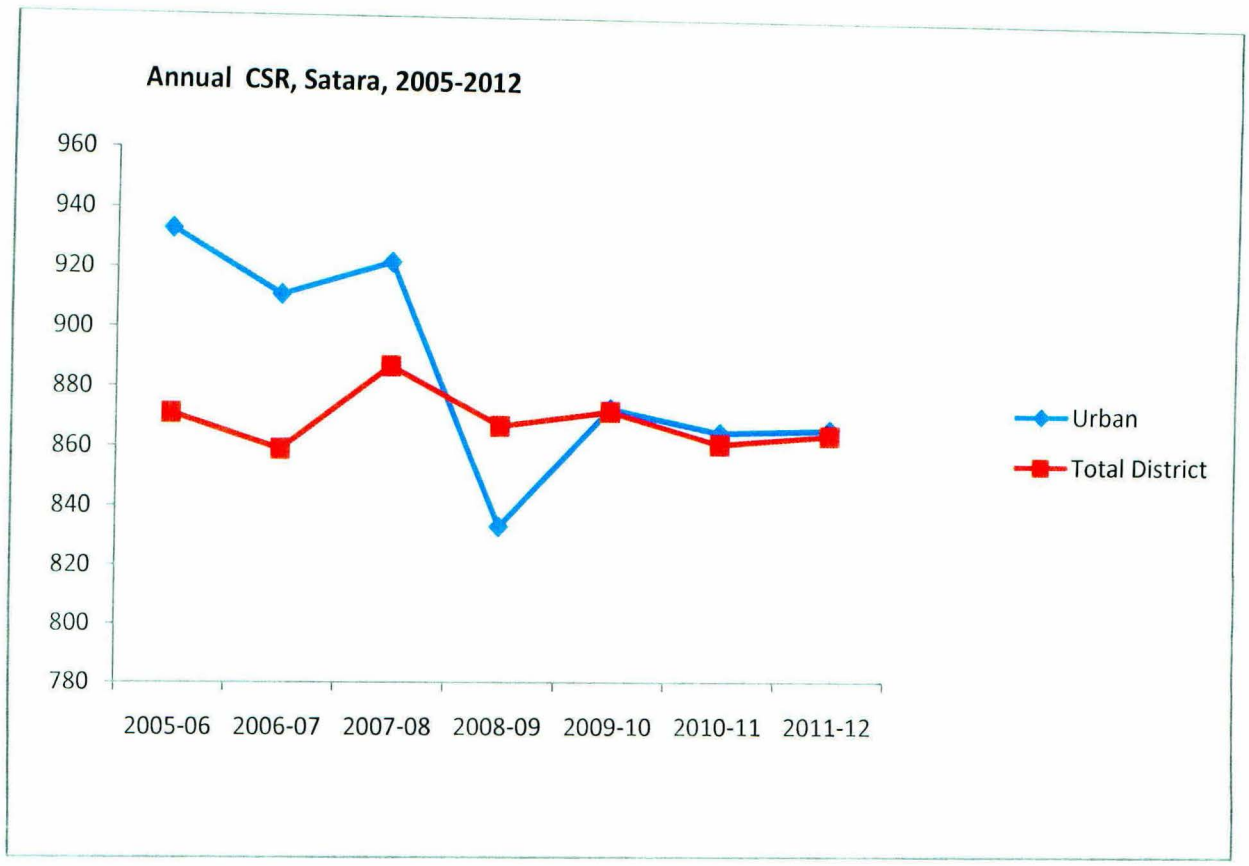
Fig. 6.2 Child Sex Ratio trends for Maharashtra and Satara district from 1991, 2001 and 2011.




Source : Census reports, 2013.

If we see the trends of CSR from 1991 we can observe the stiff decline in Maharashtra state's CSR from 946 in 1991 to 894 in 2011. Though Satara district's CSR was less than states CSR in 1991 (946: Maharashtra; 941: Satara) it dropped very sharply in 2001(878). But the interesting thing is it improved from 2001 to 2011 from 878 to 895 but state CSR experienced large decline from 913 to 894.

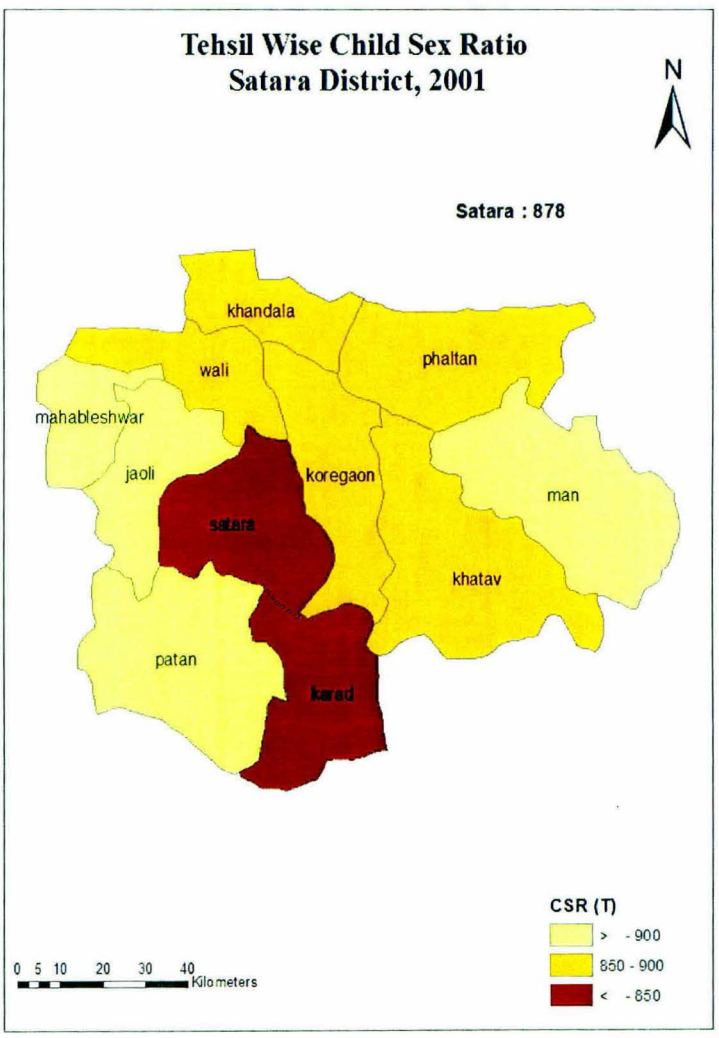
Fig. 6.3 Annual Child Sex Ratio trends of Satara district from 2005-12 .




Source : MIS, Health dept, Zilha Parishad.

Now we can observe the CSR trends annually as given by Medical Information System data (MIS) which is a source independent of the census; these data are collected and collated by the Medical Information System of the state's health department. Data from 2005- 2012 reveal that there is huge decline in Urban CSR and total CSR of Satara district in 2007-08 to 2008-09. Urban CSR is higher than Total CSR in the district except 2007-08 to 2008-09, but the gap has nearly closed. District CSR was 871 in 2005-06 and it has decreased to 864 in seven years. Urban CSR also shows huge decrease from 933 in 2005-06 to 866 in 2011-12. (Fig 6.3)

Fig. 6.4 Tehsil wise Child Sex Ratio, Satara District, 2001




Source : Census of India, 2001.

If we look at tehsil wise child sex ratio with data of census 2001, we find Satara district as a whole had CSR of 878. Developed tehsils like Satara tehsil and Karad tehsil had the lowest and the worst CSR (Below 850). While tehsils at average level of development like Koregaon, Khatav, Phaltan, Khandala and Wai had CSR in the range 850 to 900, under developed poor tehsils like Man, Patan had CSR above 900, closer to normal levels.

Table 6.2. Child Sex Ratio by Total, Rural and Urban areas , tehsils of Satara. 2001.

| District and Tehsil Name | CSR (T) | CSR ( R ) | CSR (U) | Diff (U-R) |
|---|---|---|---|---|
| Satara (District) | 878 | 881 | 854 | -27 |
| Mahabaleshwar | 931 | 935 | 924 | -11 |
| Wai | 870 | 879 | 820 | -59 |
| Khandala | 861 | 862 | 850 | -12 |
| Phaltan | 893 | 896 | 880 | -16 |
| Man | 904 | 904 | 909 | 5 |
| Khatav | 892 | 892 | 0 | - |
| Koregaon | 874 | 877 | 831 | -46 |
| Satara | 850 | 851 | 848 | -3 |
| Jaoli | 918 | 918 | 0 | - |
| Patan | 911 | 914 | 834 | -80 |
| Karad | 848 | 850 | 829 | -21 |

Source: Census of India 2001.

Satara district as whole hasCSR of 878. This is far less than the universal natural sex ratio at birth (943-952 girls per 1000 boys). It is also far below that the state average of 913. Tehsils of Satara show hugely diversified economic development pattern. Man and Khatav tehsils receive less rainfall and are categorized under drought affected region. Man and Khatav also showed very low CSR that is 904 and 892 respectively. Except Mahabaleshwar, all the tehsils of Satara district showed CSR below 920. Karad which is the most developed tehsil of Satara recorded the lowest CSR 848 that is below 850. Satara city area showed CSR of 850. Khandala and Wai have also shown CSR below 870.

Satara district has recorded rural CSR 881 and Urban CSR 854. Man tehsil showed rural CSR (904) less than urban CSR (909). Rest of all tehsils showed rural CSR higher than urban CSR. Rural CSR followed the pattern same as Total CSR of tehsils. But urban CSR is far below than total CSR. Especially urban area of Karad and Wai showed CSR in the range 820 to 830. This is in very low and disturbing range of CSR. Wais' urban CSR is almost 60 points less than rural CSR. Patan tehsil has the highest difference of 80 points in rural and urban CSR.

## 6.6 Analysis of Missing Girls in Satara district

The state level estimates give 169633 male births and 152184 female births during 2004-2011 (see chapter 4). Satara district had 9372 Sex selective abortions during that period and 9247 girls of ages 0-6 were missed in 2011 because of sex selective abortions. There were 3 SSAs per hundred total births and 6 SSAs per hundred female births. The number of missing girls due to excess female mortality is very low compared to other districts of Maharashtra, it is 604. Total missing girls of ages 0-6 are 9851 in 2011. Percent share of sex selective abortions in total missing girls of ages 0-6 is quite higher ( 94%) than share of missing girls due to excess female child mortality( 6%). So we can see Sex selective abortions are very prevalent and it should be a matter of very serious concern (Chapter 4).

## 6.7 Ultrasound Scan centres in Satara district

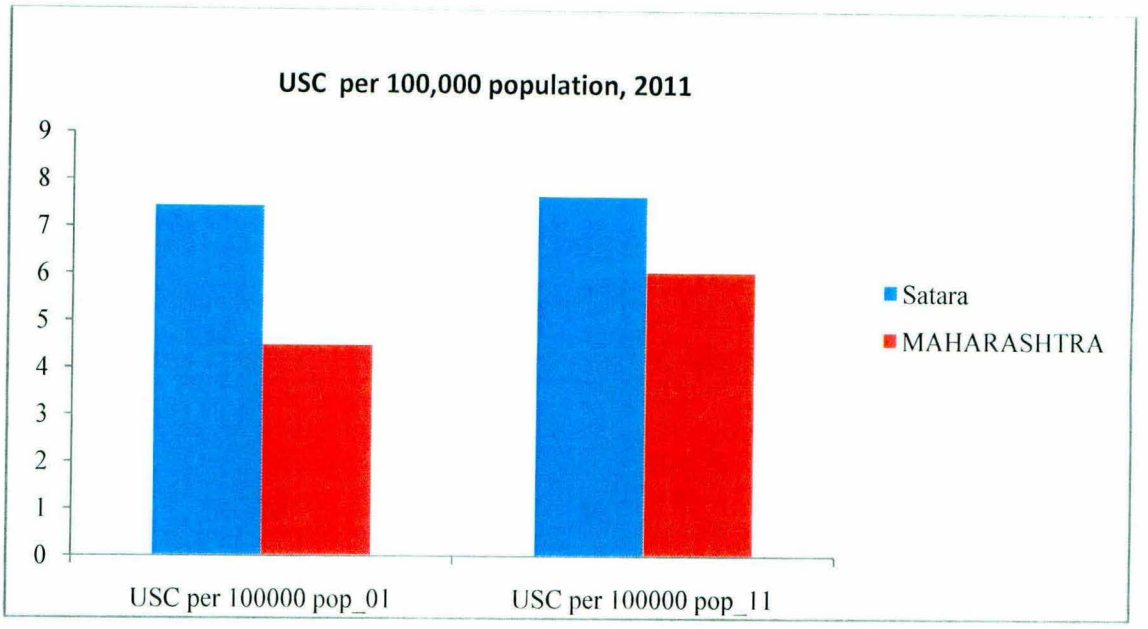
Table 6.3 Number and density of Ultrasound Sonography Centres (USCs) in Satara district and Maharashtra, 2011.

| Dist/State | USCs in 2001 | USCs in 2011 | USC per 100000 pop in 2001 | USC per 100000 pop in 2011 |
|---|---|---|---|---|
| Satara | 209 | 230 | 7.44 | 7.66 |
| MAHARASHTRA | 4345 | 6798 | 4.49 | 6.05 |

Source: State Health and Family Welfare bureau, 2011.

Maharashtra state had 4345 USCs in 2001 and the number has risen to 6798 in 2011. Satara district had 209 USCs in 2001 increasing marginally to 230 in 2011. It is important to take USC per 100000 populations as an indicator for uniformity in data. Here the interesting thing is USC per 100000 populations is higher for Satara district than Maharashtra state. It has increased from 7.44 in 2001 to 7.66 in 2011 but in Maharashtra it has increased from 4.5 to 6.0, this is a large increase. We can observe that Satara is a small district but having large proportion of USCs to serve smaller number of population.

Fig. 6.5 Ultrasound Sonography Centres per 100000 population, 2011.




Source: Health and Family Welfare Bureau, 2011.

## 6.8 Tehsil wise Distribution of "Nakusa"s (Girls who were named "Nakusa"/Nakushi)

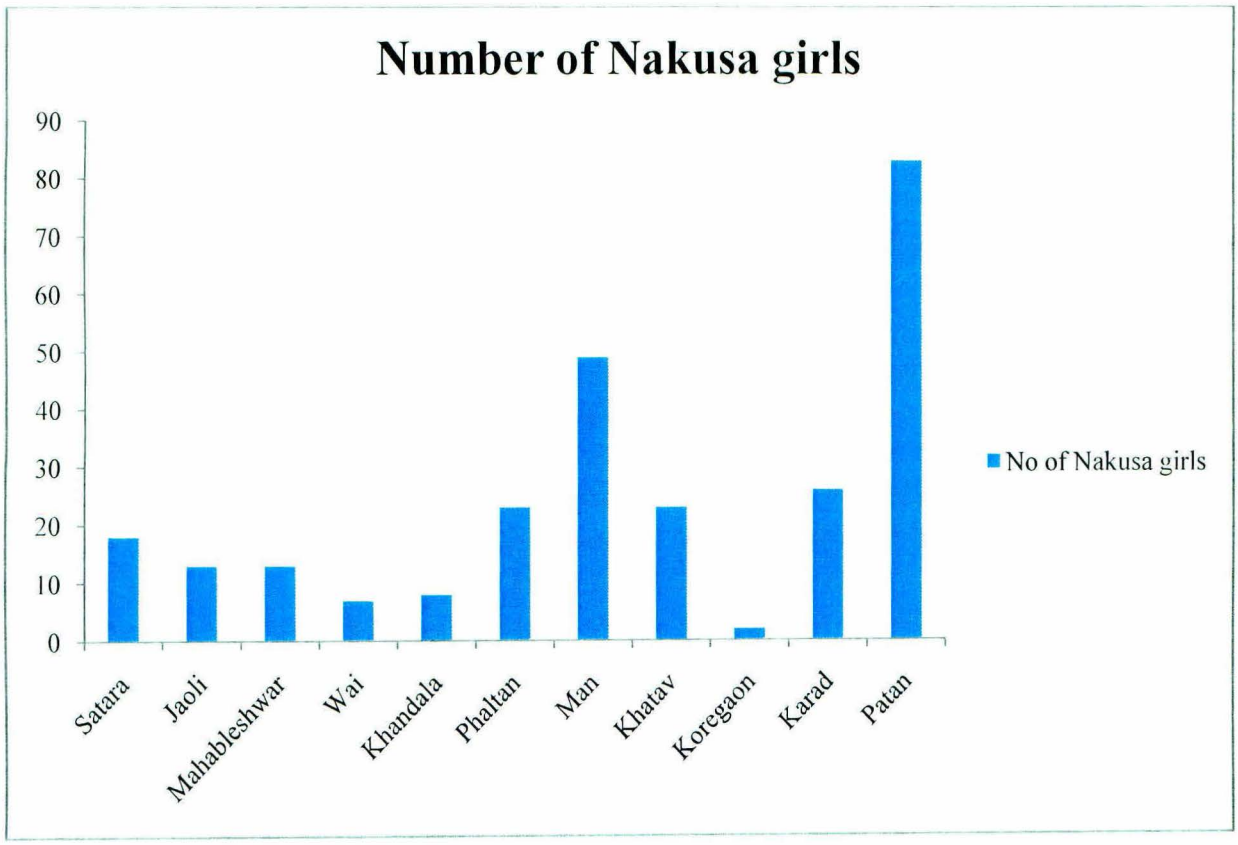
Table . 6.4. Distribution of '"Nakusa"s' in tehsils of Satara district, 2011.

| no. | Tehsil | No of "Nakusa" girls | Percentage distribution (%) |
|---|---|---|---|
| 1 | Satara | 18 | 6.79 |
| 2 | Jaoli | 13 | 4.91 |
| 3 | Mahableshwar | 13 | 4.91 |
| 4 | Wai | 7 | 2.64 |
| 5 | Khandala | 8 | 3.02 |
| 6 | Phaltan | 23 | 8.68 |
| 7 | Man | 49 | 18.49 |
| 8 | Khatav | 23 | 8.68 |
| 9 | Koregaon | 2 | 0.75 |
| 10 | Karad | 26 | 9.81 |
| 11 | Patan | 83 | 31.32 |
| | Total | **265** | 100 |

Source : Health Dept. Zilha Parishad , Satara, 2011.

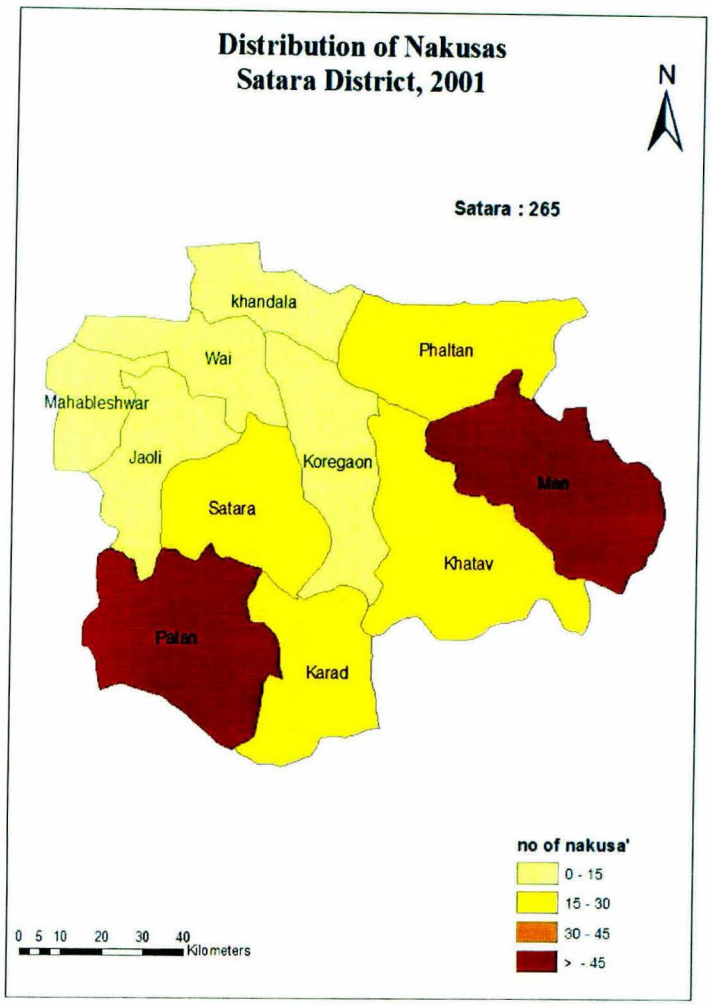
Satara district as whole has 265 girls below age 18 who were known to have been named 'Nakushi'. 83 of them have been found in Patan tehsil alone which is one of the backward tehsils of Satara district. Around 31 % were found in Patan followed by Man tehsil which has 49 (19%) such girls. Then Karad , Phaltan, Khatav, Satara, Jaoli, Mahableshwar, Wai, Khandala and Koregaon tehsils have comparatively less number of girls who were named 'Nakushi' Fig. 6.6 Tehsil wise number of "Nakusa" girls, 2011.

Fig . 6.6 Tehsil wise distribution of number of "Nakusa" girls, Satara, 2011.




Source: Health department, Zilha Parishad, Satara. 2011

Fig. 6.7 Tehsil wise distribution of number of "Nakusa" girls, Satara, 2011.




Source : Health Department, Zilha Parishad , Satara.

The two tehsils with high number of girls named Nakushi/"Nakusa" are on western and Eastern border. North, central and Karad from south are quiet developed tehsils from Satara district as they have natural gift of good soil and weather (rain). But Man is a drought affected area. Poverty due to drought and lack of agricultural production is high. Poor people want sons to have permanent labour to contribute to family Income but girls have to marry somewhere. Though they do not spend too much on girls marriage( they actually do not have money to spend , they get help from relatives to perform girls marriage) they do not give dowry, moreover girls drop

out from school and help them in daily labor but still girls are unwanted because of inevitable patriarchal marriage system.

## 6.9 Perception of People

The researcher met a number of couples in one village each of two tehsils Wai and Satara. The issues of preferences for sons, avoidance of daughters, unwantedness of daughters and sex selection were discussed informally with individuals and groups. The observations are summarized below.

There is some belief that if a woman is having girls only and no son (and they desperately want son) then naming the last born girl as "'NAKUSA"' will tell God, it's enough, please stop giving us only girls. If they name that girl ""Nakusa"" then next born would be boy. Family members do not treat them like unwanted. They just name them "Nakusa". That does not mean they do not want her but just to tell God to stop giving girl child as they want son. People want sons for old age support. They also think nurturing of boys is expensive now a days as government is providing subsidies to girls' education but not boys but still they want sons.

There were traditions and beliefs of people to give name "Nakusa" to stop having many girl children and hoping strongly for male child. But the situation is changing day by day. Now many feel that only one boy in ten is good enough to take care of his parents. In recent era, boys are very much addicted to alcohol and bad habits; they cannot even lead their lives so they ignore family. Sons are migrating for higher opportunities to urban lands and they become very busy so do not come back to take responsibility of old parents. People want family name to be carried for generations so they want a boy.

In old times, people thought girl and boy are unequal. But now-a-days girls are getting education, living in hostels, and behaving bravely. Now parents with only girls think their girls as boys. Some prefer family planning after one girl only to give her quality education and better life. As mentioned above, situations are changing as people are not sure whether the son will take care of his parents or not. They feel that girl will take care of her parents in any condition because of higher emotional bonding than boy. But they still think son as security. People want son to do their death rituals culturally, it is very deemed a fortunate thing to drink last drops of water from their son's hand before dying.

In one village dominated by the shepherd community, high dowry is not prevalent; everybody gives dowry as per their capacity or they give some gold and marriage expenses as per one's economic capacity. They think marriage as an expensive ceremony. Women think dowry system should stop. Dowry leads to domestic violence. So it must be eliminated from society.

Many women report their ideal sex composition of children is one son and one daughter with the two child family norm. But still they keep on giving births as they have to wait for Son. More and more "Nakusa"s keep on adding to household and to society. They think children are god gifted, let god decide whom to give birth. But at least one boy should be there. But they cannot afford expense of many children. If two girls are there they are unsatisfied and sad at not having a son and they hope that the next born would be a boy. They extend their fertility for the sake of boy. Nobody wants a large number of girls due to high costs. Women think there are less number of girls than boys these days as sometimes they cannot find brides for their sons.

The society is treating girls unfairly than boys. As boys will give support to them but girl will go to others' house and they will have to give dowry to her. Girl should be brave enough to tell her parents that she wants to have higher education. Though so called free education is there but school stationery is unavoidable and unaffordable so parents prefer to give facilities to son as an investment than daughters. When asked about drop outs of adolescent girls from school, women gave reasons like schools are very far from their residential place so they are afraid to send them to school as they treat girl (girl's honor) as status symbol; if anything happens to her it would not be good for her families status. People fear, as girls are becoming 'over smart' they are following TV serials and movies and they are going to hang out with boyfriends and opting for love marriages out of caste which would not be bearable by the families to live in society.

Educated people are thinking more economically and they are keen to check the sex of the child, uneducated village people think children with whichever sex are God's gift and they accept whatever comes to them. Some people think of quality of children than the quantity in inflation as educational expenses are high now. Most of the people in rural areas also want to enroll their child in expensive English medium school.

Fertility decisions are taken only by the couple, most say that nobody should interfere in those decisions not even in- laws. In- laws should not pressurize them. Couple should be brave enough

to face the family. Now-a-days women are more keen to test the sex of the child if their neighbors are having sons. Some are not so specific about sex of the child but majority of people strongly want a son.

When asked about property rights of girls a group of women pointed out that, generally girls do not take their share in property for the sake of good relations with brothers. They expect emotional happiness than financial needs. They have taken dowry as share of property. So people do not give property share to their sisters until and unless her husband dies and she has no one to support her from her in -laws home, then people give the share in property but it is generally less compared to share of brothers. People think it is understandable as brother has to support his family.

Women think people are doing sex selection to avoid high fertility. Pregnancy complications are increasing day by day. It is risky to have large number of pregnancies so people are going for abortions. But they think family planning operation is better than abortions. In any case woman has to suffer a lot.

Many said that if we are aborting a child we are killing the "God's creature". This act is offensive. But people are aware that government has strengthened the laws and its implementation. So now it's very difficult to detect sex followed by abortion.

When asked about knowledge about government programs on girl's welfare , hardly any one knew about these. Parents do not know of the higher opportunities in education so they are stopping girl's education after satisfactory level to them.

Women said, now people do not have easy access to sex selection. People are not doing sex selection as government doesn't allow them to do so but decision of not having sex selection should come by social evolution , there is need to change the traditional thought process and needs to be morally strong for change, one should felt deep within that this is wrong and we shouldn't do this. Here social mindset change is a must condition to improve situation.

## 6.10 Case Studies

Some case studies of "Nakusa" girls are described below.

**1st "Nakusa"**

Caste : 'Kumbhar' (Potter Community)

Tehsil : Satara.

The family has six members, the couple, three daughters and one son. "Nakusa" came after two girls though her parents were expecting boy at the time of her birth. So "Nakusa" is of 3rd birth order. The first daughter is married and is 22 years old. She has two boys and has undergone with family planning operation. The second daughter is 20 years old, married and has one boy. The third daughter is "Nakusa", 17 years old and unmarried followed by one son who is 14 years old and enrolled in 9th standard in village school.

In this case, the mother didn't want to give her name "Nakusa" but she had pressure from her in laws to do so. They named her ""Nakusa"" because family wanted to tell god 'enough, stop giving us girl child, we desperately want son after that'. Son will help them throughout their life but girl have to go to another home after marriage. Villagers have a belief that if they name a girl ""Nakusa"" then next born would be a boy.

The mother thinks one girl and one boy is ideal family size for her but she had to wait, keep on delivering girl children until she had the son. Children are god's gift to them. She has delivered a boy 5 to 6 years after "Nakusa".

Nakusa's family is poor and does not have money to carry marriage expenses. Marriages have been done with the help of relatives with no dowry because of poor background.

When asked about why she left the school, her father replied that the school was far from her house so for the security issues she didn't go to school. School expenses were also out of budget for her family. In any case they wanted her to join work as it was difficult for her family to cope with expense.

She wanted to complete schooling up to 12th but due to weak financial condition she left school in 9th. She didn't have money to pay fees of 10th class and her family wanted to give education to their son. She has realized the poor condition of household and sacrificed her hopes. "Nakusa" and her parents are daily wage workers who earn Rs. 50 a day; this is lower than minimum prescribed wage. She goes to work 10 to 6 and earns 50 Rs. daily and her brother goes to school and still she thinks she has been treated equally in the family.

The family owns no farms, no property. As mentioned above she left her education as they could not afford her further education. She is contributing to family income as they are very poor so she cannot be the only consumer in family. So she is helping financially. Her earnings she gives to her mother daily.

Her parents think she is lucky for them as they had male child after her. They just called her by name "Nakusa" but they do not feel that she is discriminated against. All girls from family have studied up to secondary level of education.

She is feeling great after name change. She has received the name change certificate from district administration in a big ceremony. All are calling her by her new name ; earlier all were calling her Nako (nick name) that means Unwanted. Her batch mates in school also used to tease her by her name "Nakusa". They used to ask her whether she was really unwanted to her parents ; this was embarrassing to "Nakusa" and she used to bunk the school and finally she dropped out. Her parents were not able to send her to school after that. But her family told she was very poor in studies so she left the school.

They come in Other Backward Classes (OBC) category but they cannot get government money because of system failure and corruption in between. They even do not know government programme which are useful to them so government money and schemes cannot reach to them. They have experienced that the government officials simply ignore lower classes and castes.

Family and relatives were still calling her '"Nakusa"' because of habit. They were not satisfied with the government as they missed wages and went for name change ceremony and government did not give travel allowance to them. The government has only given them the name change certificate. They were expecting some financial help from the government because of poverty.

**2nd "Nakusa"**

Changed new Name : Vidya.

Caste: *'Dhangar'* (Shepherd community)

, Tehsil : Wai

A shepherds' work strongly demands sons. They think a son is needed to continue their work chain. As son only can continue their work and go to different places for work. But daughter has to marry and go to another home.

"Nakusa" is about 16-18 years old and married. She had four siblings, 3 sisters and one brothers, out of which only two sisters are alive. The oldest sister and the youngest brother died in childhood. She is of 3rd the birth order. The second sister is also married. Younger sister goes to school and is in 5th standard.

Her mother had several daughters but no boy at the time of her birth so parents named her "Nakusa" out of frustration of not having a boy as they were expecting son and out of belief that the next born would be a boy if they name her "Nakusa". But it didn't happen as the next born was again a girl. And then after many years they finally had a boy. Her mother then had tubectomy as she had delivered a boy after four girls and the wait was over. But unfortunately the boy died in childhood; it was very hard time for the family. Her mother underwent a reversal surgery to have a son. But it was an unsuccessful attempt. She couldn't have any children afterwards. From this we can have an idea of strong desires of having son.

"Nakusa" got married after she failed in the 10th standard exam. She got married before she reached 18 years of age. She was from poor background so they got her married early with no dowry. Her husband's age is 22. He is a painter in Pune. She has cleared all subjects of 10th after marriage and is doing 11th by distance learning. When she was in school at that time also she used to go for wage work at weekend. She gets Rs 80 a day in farms. Now also sometimes, she goes for daily wage to help financially. Otherwise she does housework and study. She wants to join the Police department. She says her family members are supportive. Though her name was "Nakusa" but her family has treated her well.

She had positive changes in life after name change. She is now getting more things than she was getting before. Behavior of other family members has also changed positively towards her. She is experiencing positive changes within herself also. She is feeling positive after name change. Other family members think name has little value. Now also, after name change, family members call her "Nakusa" because of their habit to call her like that before. She thinks all should be treated equally.

Here one can observe how strong the desire to have son from her parents is. They have reversed tubectomy just because their son died and they still desperately wanted the son. They got "Nakusa" married before 18 as they didn't want any burden on them. They wanted to get rid of all tensions so parents arranged her marriage as she failed in $10^{th}$ grade board examinations. They name her "Nakusa" and moreover they had her marriage before the minimum legal age of marriage.

## 6.11 Perceptions and opinions of Doctors

The District Health Officer of the Satara district aid that female feticide is more dangerous issue than "Nakusas". District is facing problem with Scan centres and sex selection which needs more socioeconomic observations and research to study, which factors are explaining this phenomenon. But still he thinks an administration has controlled the situation and recently SRB (Sex Ratio at Birth) is increasing. It was recorded 881 in 2011 and recently it is recorded 910 (MIS data 2012). This is good sign largely due to program efforts. But it should not lead to increase in number of "Nakusas". District administration has started changing name of "Nakusas". With the hope that it will change mindset of people.

The doctors' experience has been that parents with one boy are generally not going for sex selection but parents with one girl child are increasingly going for sex selection. Moreover doctors are encouraging this fact and supplying any means for the sex selection as a new business. Doctors have created very strong networks to do sex selective abortions. Social networks help common people to find gynecologist and radiologist lobby who do sex determination followed by sex selective abortion. Many experienced and skilled people are involved in these chains. It is very difficult to identify the doctor who is doing sex selection.

Sting operation is not effective way to find out. Many times, witnesses change their statement later for the sake of big money offered to them to change the statement against guilty doctors.

Many gynecologists said that, people still ask (with hesitation), will you do sex selection but now that proportion has decreased. Generally it is observed 10 % women themselves do not want girl child but in 90% cases they come because of family pressure to have a son. These abortions should stop by certain kind of action from the government side as girls are disappearing but they might cause serious morbidity to women and harm mental and physical wellbeing.

Earlier, organizations like Doctors against Sex Selection (DASS) were working effectively on sex selection issue. It had very good commencements like banning the doctor from association (who are doing sex-selection) and finally if he doesn't agree and continue his wrong deeds then ban his registrations but this organization stopped working.

Sex selection and SSA are purposefully made things so we cannot track it at a superficial level. The doctor and family can mislead government officials. In any case, doctors can give other reasons like saving of mothers' life to justify an abortion and family can give failure of contraception to justify sex selective abortion. There are many hidden ways to protect the patriarchy in the society. *Aashas* and ANMs can track the pregnancies and missed menstrual cycles of women in village to keep an eye on any wrong thing. But tracking of pregnancies has many loopholes as woman can mislead Aashas. Sometimes due to family pressure and sometimes may be because of her own wish to have boy as she thinks girl cannot take care of her in old age. But still, emotional counseling for pregnant mothers may change the situation. The Civil surgeon said that administration is taking steps towards that. District administration is trying for collaboration with NGOs for counseling sessions.

One of the gynecologists pointed out the alarming fact that after controlling the misuse of sex selection through scan centres followed by abortions, people are now looking for alternatives to know the sex of baby or to conceive the desired sex. They are going to fraud Astrologers and fake doctors from *Ayurveda* to get the medicines which will decide the sex of the foetus. So in these ways fake ayurvedic doctors and astrologers are now misleading the people. They are giving treatment to have a baby boy. People should be aware that no medication can help to decide the sex of the child. Giving medicines for having male child, itself is a crime. People will always try to find other ways to detect their child's sex. So here again mindset change is

necessary to break down the traditional beliefs. We should emancipate women so that she can take decisions about her own fertility. Not succumb to the family pressure and to do whatever is right thing for her and the society altogether.

Discussions with doctors have come out with the solution that morals and basic mind of radiologist have to be changed. Roles of doctors and radiologist, gynecologist are very important in this issue. We should counsel them. Indian Medical Association should stand for this issue. Doctors should work jointly for this cause. Workshops should arrange to counsel the doctors, radiologists, gynecologists to change money making attitude. . Government should withdraw their Medical license who does sex selection. Peoples' sensitization is important but it's easy to sensitize 100 people (from medical field) than to sensitize 1000 people stated by civil surgeon.

The doctors feel that the consequences of low CSR are a very serious concern. Social instability will increase at large scale. It would be difficult to satisfy sexual need of boys who do not get brides because of marriage squeeze which will result due to lack of girls. There are many problems associated with Polyandry. So it is also not good option. Future consequences on boys and girls should be informed to people. Sex selection and resulting less number of girls won't increase the status of girls; it will furthermore increase the crimes against women like trafficking, rapes. As mentioned, it will increase lead to polyandry. It may exploit women's sexual and reproductive rights in a near future.

The DHO said now when district administration has control over scan centres now people are moving where they find laws are poorly implemented and getting cheap services. People are going to Bid to have an illegal sex selective abortion as western Maharashtra has tightened the situation.

When asked about why further steps have not been taken regarding the future of "Nakusas" , the DHO answered that the government thinks that " Nakusas" are not different or unique category to give any concessions. Girls are having free education by anyway. So they didn't think further for those girls. Dropout of "Nakusas" from the school is another question which is difficult to answer by the implementing body. The District Health department is thinking to collaborate with NGOs for these girls education and health issues. Public Private Partnership is the solution on which administration is thinking but further steps have not been taken by the government. Researcher observed that there is lack of political will to approach these girls again.

## 6.12 Discussion

While interviewing "Nakusa" and their families I found girls are unaware about discrimination against them or they simply accept it. There I found acceptive nature. Girls think their lives are only for sacrifice. This is the only religion of women irrespective of any caste and class and religion too. Since the very beginning of their lives, society teaches girls and boys so called 'Gender norms' of society. We judge man by his power and we judge woman by her patience. Patriarchal culture teaches us from our birth that men have to be powerful in any case and women have to be patient in any case. There should be universal acceptance of these man-made norms of society. Mothers also teach girls that girl should not laugh loudly; she should not talk loudly to older persons and even with her siblings. She should wear sober cloths covering whole body, she should not flaunt her body parts. She should come back home early before 7 o'clock, she should eat after male persons in home, she should not do certain things, she only should do certain things, and the list of Do's and Donots is endless. If any girl tries to challenge these norms then society thinks her characterless and she may sometime become victim of rape.

So because of these strongly embedded norms girls also think they should behave what society accepts. While interacting with "Nakusas" I found these girls have accepted their life as society thinks. They are carrying ' "Nakusa"' name from birth from her parents , family members, neighbors, in village, in school , everywhere she is '"Nakusa"; Unwanted'. These girls have lost their self esteem. When I asked them they replied, "it is ok , I am a girl and I have to live like this". Dropping out from school to support family, to continue brother's education, is not perceived as discrimination against them. They are unaware of opportunities that life can give to them, they are unaware of their own talent.

Parents simply say she dropped out from school because she was weak in her studies, she failed many times , she is just dumb in her studies. But if we observe their situation, family cannot even provide them the basic things to go to school. A girl helps her mother before going and after coming from school. Many times they bunk school to help in household works. Girls face teasing in their school by their "Nakusa" name. They do not have any environment and family support for their study, how anyone can concentrate on their studies ignoring all negative environments

before them. Parents cannot afford school expenses of all children and then they prefer to educate sons and girls to go to farm to help them financially, and still they do not want girls.

People simply say it is not that we do not want girls but we want boys. They think large number of girls is burden in the family and anyhow they are going to their in- laws' house, so why we invest on her rather than on boys who will be going to help them in old age. Parents of "Nakusa" do not have money to spend on her marriage. Relatives help them to carry daughters' marriage; they do not give dowry to her as they do not have money. Here in poor families, there are no expensive marriages still they do not want girl even if she supports them financially over boys, since she has to go to her in laws home and here the problem of security comes. And that's why they prefer boys over girls. In some cases girls are wanted also for emotional support, to take care of her younger siblings, to go to field with them and to earn daily wage to help in home so she cannot be only consumer but worker also. But eventually she is not her parents "PROPERTY "she has to marry someone and go to their house to serve her husband and in laws in old age. So at some point she is wanted but eventually she is UNWANTED. Here they ignore them still need one girl who is their daughter-in-law to help in old age.

Mothers do not think they are discriminating between son and daughter. They say, "we do not name her but in -laws name her "Nakusa"". They wanted to give her another name but didn't have any say against older persons in family even if they know it is bad to call their daughter by this name. Here Nakusa's mother also does not have any say in her family and she passes on values and virtues of 'secondary position of women' to her daughter (as she experienced the same throughout her life and she wants the same values from her daughter).

Here we must note that is not only girls who were named '"Nakusa"' are the only girls who are unwanted. There are many girls who might not have the name '"Nakusa"' but are unwanted. "Nakusa" is of course the strong case, but there are many girls in society who experience discrimination in their daily living. Only "Nakusa" got focused because of the name.

I came across the statement, now parents with only girls think their girls as boys. People told now situation is changing, some people are stopping at one girl only, *AND THEY ARE*

*TREATING THEIR GIRLS AS BOYS.* Here is the interesting point person made. Still indirectly or deep in their mind boys are superior to girls. People make idealistic points superficially but if we observe their statements deeply still there is a patriarchal mind which dominates. In my field experience, people respond what you want to hear, they speak idealistic things but if we observe their living there we see the discrimination and strong patriarchal practice.

District administration told that by this program they have not only changed the societal attitude towards girls but changed girls' attitude about themselves. Earlier girls were depressed with low confidence because of feeling of unwantedness but now they knew they are in need to society so ultimately this program has generated self esteem in them. Now their name is no more insulting to them. They are no unhappy with their names. Girls are feeling attitudinal difference in their lives. Whether it really changes their living is a question mark for now.

Name is a person's first identity for society and these girls had it as Unwanted. It was a good idea to change it. It's easy to change name but might be difficult to change identity from birth. Nonetheless it is first step to change the mindset of society but still there is a long way to go. Name change might change societal perspective towards girls who were named "Nakusa" but the government should help them to stand proudly in society by making them aware of their position as a human being than as a girl. The government should design policies to empower those girls by again providing them chance to have good education and health and employment to break their traditional beliefs and idea of being oppressed. Moral education is necessary to gain their self esteem so that they can decide what is right and what is wrong not by societal point of view but by moral background. Changing name is the first step towards that but it should not be the last, its breakthrough of silence, it's just beginning to know their importance but there is a long way to go to change the mentality of society.

# Chapter 7

# Summary and Conclusions

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*"The best thermometer to the progress of nation is its treatment of its women"*

*-Swami Vivekananda*

## 7.1 Key Findings of the study

The child sex ratio (0-6) provided by the census 2011 depicts that situation is disturbing. The numerical estimation carried out in this research gives clear idea about how alarming the situation has become in Maharashtra over the period of time.

Using the demographic analysis, the numbers of sex selective abortions in periods prior to census were estimated. Further, the numbers of missing girls of age 0-6 on account of excess female child mortality were also estimated. There were 200741 girls found to be missing because of SSA by census 2001 and the figure has increased up to 392995 over the last decade of 2001 to 2011.

In 2011, the sex selective abortions are the highest recorded in the Pune district whereas Gadchiroli district had negligible number of SSAs. Missing girls due to excess female mortality is the highest in Nashik district and the lowest in Ratnagiri district in 2011.

Around 444035 girls of ages 0-6 were missing in Maharashtra on the 2011 census date. More than 392000 (88.5%) of total missing girls are contributed by SSAs and only 11.5% by excess female child mortality while the proportion of missing girls due to SSA was 60 % and due to excess female child mortality was 40% in 2001.From these figures we can have some idea of wide spread practice of sex selection in Maharashtra. Total missing girls are the highest in Pune district followed by Jalgaon district because of the high sex selective abortions. Total missing girls are the lowest in Gadchiroli district followed by Gondia district and are mainly contributed by excess female child mortality. For more deep understanding we have used the SSA as a

percent of total and female births as an indicator to study the intensity of problem. Here the study has found the real emerging sex selective abortion centres are the central districts of Maharashtra. Bid (16%) followed by Jalgaon, Buldhana and Ahmadnagar (around 11%) SSAs per hundred female births. The sex selection has become a serious issue in this region which needs immediate and sufficient attention by the government officials. The proportion of SSA as a percent of total and female births has been doubled in a decade in almost every district of Maharashtra.

Maharashtra is experiencing regional divide in terms of prevalence of SSA and excess female mortality. Earlier and still now also western Maharashtra is struggling with the sex selection but surprisingly sex selective behavior has boomed in the districts from Central Maharashtra. This phenomenon needs to be studied deeply. But the overall observations are driving the conclusion that central Maharashtra districts are adapting the sex selective behavior from western Maharashtra. Increasing scan centres and high demand for the son might be the reasons behind this scenario. But when we study the relationship between USCs per 100000 populations and CSR, the study did not find any significant relationship between these two controlling the other development factors. As there might be enough USCs to serve all purposes of population. After certain point, the number of scan centres may not show any significant impact on CSR until and unless strong regulation has been used. As expected CSR has shown significant negative relationship with the level of urbanization and share of cultivators because of availability of sex selection services in one hand and on other hand there is strong son preference.

Clearly, sex selection appears to have played a major role in causing the deterioration in child sex ratio. The contribution of excess female mortality among infants and children contributes relatively less. This echoes the findings of Guilmoto(2007).

The practice of sex selective abortions has spread in Maharashtra in the last two decades chiefly in the western belt and in Central part of Maharashtra. The numerical estimation carried out in this research gives clear idea about how alarming the situation has became in Maharashtra. The causes that lead to sex selective abortions in family are not our primary scope of study; however we cannot lose sight of the fact that sex selective abortions are the result of various demographic, economic and social factors. All these have resulted in an imbalance in the child sex ratio and

further disturbing the overall sex ratio. It has been deemed that in India, most cases of sex selective abortions are because of social causes, dowry being one of these.

The Maharashtra government has opposed the practice of female feticides, but it has been slow and ineffectual in bringing about reforms. In India, induced abortions are permitted under a large number of circumstances including the failure of contraception for over 40 years following the enactment of the Medical Termination of Pregnancy Act of 1971. One thing which most people tend to overlook is that imbalance is further aggravated by excess female child mortality. The causes of this again do not fall within primary scope of the study. However the universal reasons are poor nutrition, vaccination, and less attention (less utilization of medical care) meted out to the girl child as opposed to their male counterparts.

Furthermore, in the field study in Satara district, which has introduced a scheme to rename girls named " Nakusa"(Unwanted) by parents opinions and perceptions of such renamed girls, their parents, government officials and community members were obtained. Researcher has accessed the unwantedness towards daughters through the "Nakusa programme" in Satara district. The study has found strong dis –preference for girls in the communities. Parents of the girls who were being named "Nakusa" had no guilt of naming them "Nakusa" they told it does not mean they do't want girl but they wanted a boy. They think discrimination is a part of women's life. Girls whose names have changed by the programme were happy with this name-change but they have somehow accepted the discrimination, now it has become their part of living. Government can change the names of girls but whether it will help them to uplift their living is a question because of deeply rooted wrong beliefs of society. Breaking of this belief system would be the starting of change; it's a big challenge to design any intervention programmme by the government.

**7.2 Some insights from the field**

On issue of sex selection, Mother should be brave enough to face the family and husband. Here education plays a least role and moral values take an importance and how strongly you handle the opposition from family to have a girl child and to oppose their immoral values. Most of the times people do't think about the woman, they just want son and they can wait for him despite

the number of girls keep adding in the family by waiting for boy and they forget about delivery sufferings which woman has to suffer a lot.

The "Nakusa" name was mentioned in the official records and certificates of girls. It is difficult for us even to imagine a girl being addressed as 'unwanted' in every casual and formal communication. The " Nakusa programme" was introduced with a good purpose and given publicity however after the three grand ceremonies of name change, no proceedings have been taken at all from the government side. The Government is yet to make name change gazettes after two years of survey programme. They have asked the parents to do this by themselves and they ignored the fact that each "Nakusa" comes from a poor family, it is difficult for that family to go for gazette notification that too by leaving their daily wage and moreover to pay for gazette charge for name change. It is the government's responsibility to make name change gazettes notifications for all girls. But after huge media attention and appreciation, now the government is not willing to take further steps. Many social activists said after the renaming and the public attention, the district administration has to ensure that the girls get financial support for their education and health. Only name change will not have any positive impact on society which the government hopes for. It will be portrayed as mere publicity by the government.

**7.3 What society is doing?**

Unfortunately, highly educated people are doing economic analysis by quality vs quantity trade-off of children. This phenomenon causes fertility decline and high son preference for economic returns (by intergenerational transfers). So now rich vs poor and SSA vs "Nakusa" phenomenon is taking place. Rich people are going for Sex selective abortions as they have knowledge, networks and money to do that and poor people are naming their daughters "Nakusa" out of frustration. No wonder that even before birth, the girl child is viewed as a burden. Specially, the Sugar belt and milk belt (Kolhpur, Sangli, Satara) of western Maharashtra is facing problem of less number of girls. Districts like Ratnagiri showed highest CSR because they want women for production of rice and another reason is they do not use technology much so CSR of those districts is quiet balanced. In the sugarcane belt, there is sugarcane cutters culture. Sugarcane cutters are mainly seasonal migrants from central districts of Maharashtra like Bid, Aurangabad. They want pairs, one man and one woman called "*Koyata*" in Marathi. But if they produce girls then labour will go out of family. If they produce a boy he can have number of girls so labour

will increase that's why they want sons over daughters. So Bid is popular for illegal abortions for 500 Rs only. Many seasonal laborers do come to western Maharashtra for sugarcane cutting where large numbers of sugar factories are based and that might be one of the reasons to sharp decrease in CSR in Central parts of Maharashtra. A large number of districts falling in central and southern Maharashtra stretching from Jalgaon to Kolhapur are seen to have very low child sex ratios.

### 7.4 What the government is doing?

In discussions with the government officials, they explained their action plans to control the sex determination.

1. They go for quarterly visits to Ultrasound Centres (USCs) for inspection.USC personnel should submit quarterly report by month to the government authorities.
2. The government officials make surprise visits to the USCs as an inspection. Further it is mandatory for the government officials to go for visits to clinics as per complains.
3. The Government have started "aamchimulagi.gov.in" website to help the deprived women and girls. Moreover Government has started free helpline: 18002334475 to report compliants against discrimination and to inform government against any wrong deeds.

In spite of that Government officials think speedy disposal of court cases would be the better solution to stop this practice of sex selection.

The Government is organizing awareness and sensitization camps on this issue through IEC (Information-Education –Communication) campaigns.

To control sex selective abortions, *Aashas* and ANMs are following ANC visits. They have made monitoring strong. They are tracking the pregnancies. The District Health Department have checked missing pregnancies through monitoring and statements of ANMs have been taken. Tracking of pregnant women and missing pregnancies had been strengthened over the time. District administration monitors the birth records and finds difference between expected births and actual births. Moreover in Satara, they have found 76 doctors were possibly doing wrong things and filed complaints against 12 doctors in 2011.

Some programmes like "Revised Savitribai Phule Kanya Kalyan Yojana" has been proposed however it has not been taken up and did not fulfill the objectives by the government of Maharashtra. Moreover government Schemes and policies are outdated and need amendments over time.

### 7.5 What the government can do?

Government should seriously carry out public awareness campaigns about government policies and programmes about which common people hardly know. The budget for IEC (Information-Education-Communications) campaigns should be increased. Seminars should be arranged to sensitize doctors, radiologists. But it can be definitely argued that most of the IEC material on the issue of sex selection is not only confusing but also is patriarchal and patronizing where the female is shown as having utility function particularly child bearing. It does not uphold the dignity of the women. This entire issue needs to be reevaluated.

Birth monitoring should be strengthened. Records on pregnancies are poor in quality so it's difficult to implement the act. Pregnancy registration should be made compulsory at micro level and give the women ID card so on basis of that government can track the missing pregnancies and birth records also will automatically strengthen. So that we can start from roots of the problem not when the problem of sex selection appears. Here village level micro planning is needed to manage the situation. Role of community leaders towards dignity of the girl child is important. Villagers should take responsibility; they should raise the issue in *Gramsabha*. Guilty persons should be charged under the sections. Many amendments are also necessary for effective implementation. In order to strengthen the provisions of the Act, the Government must adopt concrete measures throughout the state to curb both demand side as well as supply side of the pre-natal sex selection practices.

Government can use bogus cases / Decoy cases in sting operation to know the networks of doctors and to breakdown the chains. But it has been observed that many times decoy cases change their statement for the sake of big amounts. Witnesses many times break the trust.

The DHO and civil surgeon said that now the situation has been controlled by the government. The Government has to seal the machines permanently. But lot more has to be doe; One gynecologist said that government should take responsibility of aged persons and education and

marriage of girls. Government should increase old age pension coverage and amount of pension as old age security is major concern for parents and that is why they want boy. So the state is responsible to its vulnerable populations like aged persons and unwanted girls. Moreover it should give pensions to poor people. The government should adopt vulnerable persons like poor and old people. Government should respond to the people who will take care of them in their old age. All of these MTP and PCPNDT acts are helpless till then.

In the "Nakusa" programme also, name change *per se* do not lead to anything. Girls' situation will not change much by this program. So it should adapt "Nakusas" and bear their expense. The government should conduct public marriage ceremonies to avoid huge expense on marriages and stresses on girls' parents, those are poor. It should be made an offense to name a girl child as "Nakusa".

Money making attitude of doctors and radiologist has worsened the situation. But government should implement the PCPNDT act strictly. Moreover, the government should control Drug distributors who are giving abortion pills. The Health department should continue sting operations and police department also should take action against illegal practices.

The Government has limitations in peoples' very private and sensitive decisions about their reproduction so it cannot force them in fertility decisions. Actually, instead of forcing them, changing their thinking is a real challenge. Thought evolution process is important than revolution as its effects would be sustainable in that case along with law and orders.

The Government should regulate the misuse of technology on scan centres rather than just controlling their number. Regulation is always a safe option as if we control number of scan centres, there is possibility of increasing misdeeds in present scan centres but if we regulate and monitor the scan centres there will be control on misdeeds and SRB and CSR will increase. It must be noted that the technology of ultrasound scans is used for various diagnostic purposes and not merely for sex detection. Clearly, access to the technology cannot be curtailed. But the issue is about its misuse.

The discrimination happens because of property issues. Change in mindset is long term process. But issue of sex selection and abortions should be addressed immediately by skilled governance. Girls and women would remain in secondary position as their names do not appear on land

records. Social development and skilled governance should go in parallel manner to stabilize society.

Moreover, the government should strengthen the lobby of non medico professionals. The Drug and food inspector should keep control over dealers and wholesalers of drugs specially abortion pills. Police Inspection is necessary at every stage. The government should inspect Drug supply and medical stores who sell abortion pills which are banned. Checking prescription and sale of the drugs is necessity. Moreover, nowadays, ethical doctors' forum is societal necessity.

Strong laws are needed to be implemented properly against sex selection. Structural reforms like land ownership can also make a difference. India has to plan for social and economic security policies for older persons to reduce longing for sons to give old age support. Government should take responsibility of older persons. NGOs also should take initiatives for welfare of older persons like provision of old age homes.

### 7.6 Role of civil society

"*Lek Ladaki Abhiyan*" (NGO) is seriously working on this issue since 2005 and has doe many sting operations in Satara district. The founder of this organization is Adv. Varsha Deshpande. But after the sting operations now many cases are pending in court. Many have changed their statements for money. But the organization's struggle is going on. They also counter check Sonography center.

District help groups support groups are necessary to empower women to support her against sex selection and naming her daughter "Nakusa". Village level saving groups can help woman financially. Women's panel should be there at tehsil level to help woman in any complaints against family. Women and child development officers, '*Gramsevika*', '*AASHA*', ANMs, and MPWs should make their strong network to solve social problems against girls and women. They should conduct monthly meetings for women and educate them on various issues to uplift their knowledge and decision power. To reach people is a difficult task. Government should reach to people in a friendly way.

The government programs and policies are not enough to cope with this issue. Strong acts, its implementation and awareness campaigns should go side by side to make change in societal

mentality. Till now medical and health department holds responsibility to tackle with decreasing child sex ratios but doctors think , it should not be the programme of only one department. It so social program so other departments have to take responsibility and should work in collaboration and actively take steps to control the situation. Besides that society as whole also have responsibility. So involving individuals from society would be the best option and administration should try for that positive and responsible change.

It is societal responsibility to stop sex selection and discrimination against girl child. The society should resist this behavior in every level; people have to educate the family, neighbors, community to stop this insensitive act. People should oppose discrimination at any level and should try to bring equality among girls and boys. Society should oppose the dowry system and violence against women. If anybody find there is act of breaking the law then one should inform government officials. People can be part of NGO's who work against sex selection; help the organization in fight against sex selection and patriarchy. People should not be silent observer of situation. Dowry system is invariably to be blame. People should keep in mind that female feticide is the symptom of increasing crime against women.

**7.7 Discussion**

It is very difficult to control sex selection as it happens with the consent of parents and medical officers together. It is prestigious in society to have sons but it lowers value in the society if a woman has only daughters. She has to go though many types of violence so at some time woman also wants to have son to have stability in family. Many times in- laws put lots of pressure on her to have a son otherwise her husband would go for second marriage. She is also afraid that her husband may marry someone else to have son. So she herself wants to have a son to please her in- laws and to become a good daughter- in- law. As in Indian society, a daughter-in-law who has higher number of sons receive higher status in the family. When we look at the property distribution in India, though under the succession acts both sons and daughters are entitled to inherit the property, customarily only son would be inheriting property. Daughters generally don't take the share in property as family had already spent a huge amount on their marriages in the form of dowry and other expenses.

The current response of the community highlights the need for a wider discussion on the problem and for a consensus on the desired outcome of the act and ground realities. The provisions of the PCPNDT act for saving girl fetus are good on paper, but have proven illogical on many occasions. Implementation of the act is creating problems in functioning to government bodies and private practitioners. Yet gender – related policies continue to promote and even achieve their specified targets of increased access but are unable to counter female foeticide.

One should be well aware that sex selection as phenomenon did not come to our society solely due to the advancement of medical science. Killing the girl child after the birth was old practice in Indian society years before we even heard of terms like sex determination tests, sonography, radiology, etc.

One cannot control sex selection just by implementing stringent rules for monitoring and controlling medical practitioners. That is why when we talk about laws to address female feticide, we also talk about laws to prohibit dowry, laws recognizing right of women to property and inheritance, laws to protect women from domestic violence, and laws to protect from abuse and exploitation in society. PCPNDT is one of many tools for achieving the same goal. One can also be aware that changing laws and strict implementation of laws will not by themselves lead us to the goal. We have to change social mindset and the many discriminatory practices through economic, social and political empowerment of women. With regard to issue of female feticide, it is the social mindset that needs to be changed.

Moreover, the younger generation should not misuse technology under influence of traditions and downgraded beliefs. A sensitive thought of equality of women must be created in the younger generation, so that a developed and thought oriented atmosphere would be created. Where there is demand for sex determination and unfortunate elimination of unwanted female fetus, there has to be strong national approach that involves society.

One thing that should be keep in mind while designing the policy is that India is no longer broadly regional, rather it is context- specific due to huge diversity, where the context has to be examined at micro levels. Therefore, it is essential that policymakers identify and target different policy levers to women in different fertility and social contexts, rather than try an approach of one size that correspond to all.

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