

## Declining Sex Ratio in Sikkim: A Spatial Analysis

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### Abstract

*The overall sex ratio nationwide (number of females per 1000 males) in 2011 census has improved by seven percentage points to 940 against 933 in census of 2001. This is the highest sex ratio at the national level since the census of 1971 and a shade lower than 1961. According to census 2011, the sex ratio in Sikkim is 889 females per 1000 males, which is much lower than the national average. In socio-economic front, the women in Sikkim are generally not secluded and the instances of female infanticide have not been officially reported in the state. The paper examines the causes of decline of sex ratio based on some empirical data.*

**Keywords:** Sex ratio, National Family Health Survey (NFHS), Age- Sex structure, Infant Mortality, Maternal Mortality, Migration.

### Introduction

The sex composition is considered as one of the significant demographic social indicators for measuring the status of male and female in a society. The sex composition of a population is often measured in terms of sex ratio. In India the sex ratio is calculated in terms of number of females per thousand males. It is a broad indicator which reveals the ground realities that exist in the fabric of the society. Present sex composition determines the future vital events such as marriage rate, age structure, labour force, births and deaths. In many societies the present sex ratio is skewed due to a host of factors such as early marriage, age of mother at birth, sex selective abortion, infanticide, infant mortality, maternal mortality, health hazards of women and migration. In the recent decade there has been a drastic decline in sex ratio in Sikkim which is an issue of grave concern. The social position of the women in the state seems to be better than that in the rest of the country. Women also play a major

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role which is visible in every public sphere whether in government jobs or in trading activities, which allows them to participate in decision-making far more than in most other States in India. This reflects the autonomy of women in Sikkim. Women are not secluded, while instances of infanticide or dowry-related deaths have not been reported (Sikkim Human Development Report, 2001). Hence this paper tries to reveal the reason for such a low sex ratio in the state.

### **Study area**

The present study area is Sikkim. Sikkim a beautiful state nested in the Himalayas has a total area of 7096 sq. km. Completely landlocked and crisscrossed by green valleys, high peaks, and rippling rivers, decorated by a spectacular array of the most exotic and colorful orchids, Sikkim is referred to as nye-ma-el (heaven) by the Lepchas, which means 'new palace' in Nepali, and denzong (land of rice) by the Bhutias. It lies in the north-eastern Himalayas, between 27°04'46" to 28°07'48" North latitude and 80°00'58" to 88°55'25" East longitude. It is bound on the north by China (Tibet plateau), on the east by Chumbi Valley of Tibet and Bhutan, on the west by Nepal and on the south by Darjeeling district of West Bengal. The present population of Sikkim according to 2011 census is estimated to be 607,688.

### **Objective**

The present paper aims to examine the causes for the declining sex ratio in Sikkim.

### **Methodology**

The study is confined to empirical research based on secondary data such as Census of India, National Family Health Survey (NFHS-3) 2005-06 of Sikkim, Sample Registration System Bulletin, 2011, Reproductive and child health-District Level Household survey (DLHS-2), Sikkim, 2002-04, Sikkim Human Development Report, 2001. On the basis of tables diagrams have been prepared.

### **Trends of sex ratio in Sikkim**

The demographic trend in Sikkim of 2011 census has revealed that the sex ratio in Sikkim stands at 889 females per thousand males as against 940 at national level (2011 census). As per 2011 census women constitutes 47 % of the total state population. From 1961 onwards it went on decreasing till

1981 and thereafter from 1991 it increased and reached 889 females per thousand males in 2011 which is unsatisfactory for the state.

**Table: 1**

Sex Ratio of Sikkim: 1961- 2011							
Sl. No.	Districts/ State	Sex Ratio (Number of females per 1000 males)					
		1961	1971	1981	1991	2001	2011
1	North district	888	853	789	828	752	769
2	West district	N.A	937	906	915	929	941
3	South district	917	909	854	892	927	914
4	East district	884	791	797	859	844	872
5	Sikkim	904	863	835	878	875	889

Source: Census of India 2011, Provisional Population Total, Paper 1 of 2011, Sikkim Series12.

The sex ratio for Sikkim district wise is available from the year 1961 (table 1). The west district has the highest sex ratio among all the districts from the year 1961-2011. In 2011 census the west district's sex ratio was 941, slightly more than the national average of 940, whereas all other districts have a low sex ratio with north district recording the lowest.

### **Distribution of Sex Ratio by Age Group**

The issue of sex ratio has been quite intriguing in Sikkim. According to 2011 census of Sikkim, the proportion of males is greater than females in all age groups. The female population is highest in the 0-4 and 5-14 age groups (Table 2). This implies that the people in the state do not practice ill practices like female foeticide and female infanticide is also less. There is a strong respect for the girls in the state. One finds a drastic fall in the female population in the 30-34 age group and it continues till 55-59 age group. It again improves steadily for the 60-69 age group but starts drooping from 70-74 age groups (Table 2). One possible strong reason for such a behavior of sex ratio in the different age groups could be that the mortality rate among the females in the age group 30-59 is relatively much higher than the 0-29 and 60 plus age group (Sikkim Human Development Report, 2001). In fact, the mortality rate among the females becomes much sharper as they climb the age ladder between 30-59 years. The government officials of the state are of the opinion that adverse sex ratio is due to high maternal mortality. The steady

improvement in the sex ratio in the 60 plus age group points to the fact that women who survives in the 30-59 years mortality zone tend to have a similar life span as that of men, having good health and a much higher longevity (Sikkim Human Development Report, 2001).

**Table: 2**

Age groups	Persons	Males (%)	Females (%)
0-4	52269	51.25	48.74
5-9	64970	50.26	49.74
10-14	71668	50.95	49.05
15-19	63444	51.45	48.55
20-24	55171	53.59	46.41
25-29	47552	52.50	47.50
30-34	39153	55.30	44.70
35-39	36384	56.02	43.98
40-44	28129	57.64	42.36
45-49	22177	57.86	42.14
50-54	16919	57.75	42.25
55-59	12037	58.74	41.26
60-64	10469	55.52	44.48
65-69	7593	55.97	44.03
70-74	5523	58.54	41.46
75-79	2749	56.46	43.54
80+	2706	57.06	42.94
Age not stated	1938	53.77	46.23
All ages	540851	53.34	46.66

Source: Rural Urban Distribution of Population, Director of Census Operation, Sikkim, 2011. (Male and female % has been calculated by the author from the original data).

### Cause of low sex ratio in Sikkim

The adverse sex ratio in different age groups is due to a host of factors like early marriage(Sikkim Human development Report, 2001), lack of attitude towards maternal care, health hazard, and migration.

**a) Impact of Early Marriage:** The persistence of early marriage reinforces women's low status and social isolation, and such marriages almost forces girls to prematurely end their education and to assume household responsibilities. At the heart of early marriage in Sikkim, is the system of

socially sanctioned elopement (bhagaune pratha) (Government of Sikkim 2001, 35). Bhagaune pratha allows a boy and a girl from different castes and social background to elope. After three days of living together, the boy's family goes to the house of the girl to inform them of the whereabouts and wellbeing of the girl and thereafter the marriage is formalized. In traditional marriage ceremonies the high levels of expenditure which have to be incurred have also helped to give a authorization or consent to bhagaune pratha. Young boys and girls who want to avoid going to school or take up any family responsibility have increasingly stated this practice of elopement for the last few decades.

Since NFHS-2 the percentage of women in Sikkim aged 20-24 married by age 18 has increased. As per NFHS-3 the women age 20-24 married by age 18 is 30 % and 24% of men age of 25-29 years got married by the legal minimum age at 21. Early marriage usually leads directly to child bearing, given pressure largely exerted by mother-in-laws through their sons, for a young bride to have a baby relatively quickly. This quite often results in maternal mortality because the young mothers are unhealthy, immature and are more likely to experience complications during pregnancy and child birth which decreases the sex ratio. The median age at first birth for women aged 25-49 years is 21.9 in Sikkim. Early motherhood is linked to poor maternal health outcomes, these increase the likelihood of poor infant and child health outcomes and also increases the maternal mortality rates. Young girls in Sikkim are more likely to have children with low birth weight, inadequate nutrition and anaemia. There is an increased likelihood of neonatal death, still birth as well as child and infant mortality.

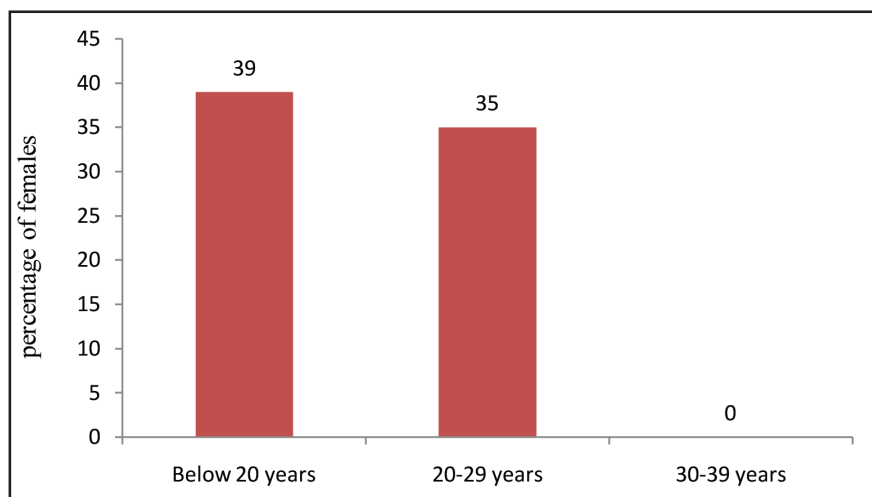
**b) Short spacing of birth interval:** Birth interval is the length of time between two successive live births. Researchers have shown that waiting at least three years between children reduces the risk of infant and maternal mortality. 53% of non first order births occur within three years of the previous birth, including 7% of the births that take place within eighteen months of the previous birth and 20% takes place within twenty four months (NFHS-3). This short spacing of birth interval between children in Sikkim had increased odds of neonatal, under-five mortality and maternal mortality.

**c) Maternal Mortality Rate:** High maternal mortality rate is an acute problem of Sikkim's women. There is very little work done on maternal mortality in the state. In Sikkim, women have a high risk of deaths during

pregnancy and childbirth. Early marriage, poor health services, high fertility rate, low spacing of births, son preference are the main causes of the high Maternal Mortality rate and the major reason for the low female life expectancy in Sikkim.

**d) Infant and Child Mortality:** Death rates in girl child are in no way different from the boys. In other words, there have been no sex differences in mortality among children which reflects that the state do not practice social evils like infanticide. The infant mortality rate is currently estimated at 34 deaths before the age of 1 year per 1000 live births, where the infant mortality rate for males is 35 and for females is 33 (Sample Registration System Bulletin, January 2011).

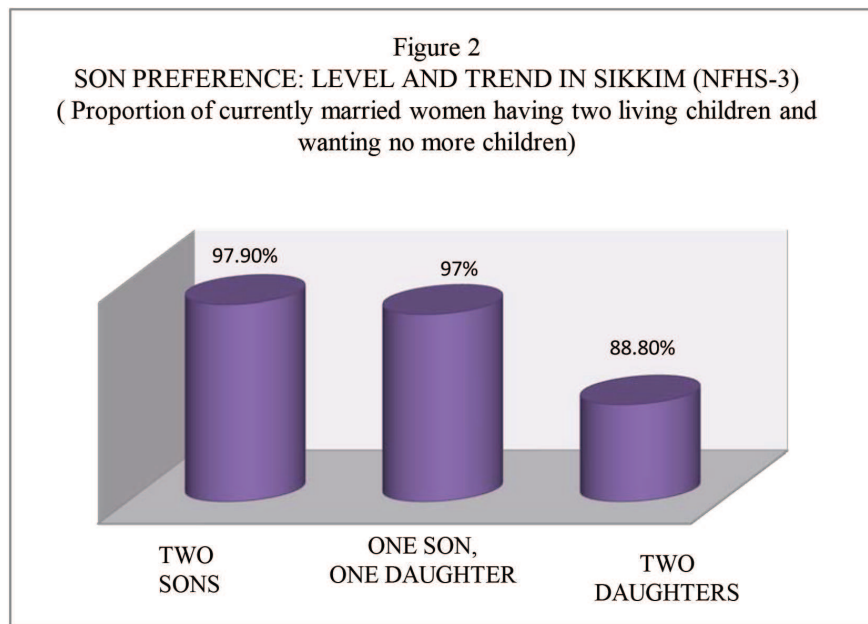
**Figure 1: Infant mortality rate by mothers' age at birth 2005-06, NFHS-3**



Girls in Sikkim have a lower mortality risk (19.9) than boys (25.2) during the neonatal period, but a slightly higher mortality risk (13.1) than boys (12.1) during the post neonatal period (NFHS-3) due to lack of proper neonatal care which decreases the sex ratio. The child mortality rate (at ages 1-4 years) is same for girls and boys (7.1 for boys and 7.0 for girls-NFHS-3).

Children born to teenage mothers have a slightly higher risk of dying in the first year of life (39 %) than children born to mothers in their twenties (35%) (NFHS-3).

**e) Fertility Preferences:** Though a women in Sikkim will have an average of only 2.02 children (NFHS-3) in her lifetime which is lower than the national average, where fertility is below replacement level, but there is some evidence of son preference in Sikkim(NFHS-3 page-7). Some families still have the traditional mindset to have a male child. 16% of women and 17% of men want more sons than daughters (NFHS-3) but only 4 to 6% of men and women want more daughters than sons. However, 72% of women and 80% of men would like to have at least one son, whereas 67% of women and 73% of men would like to have at least one daughter (NFHS-3). This preference of son over daughter reflects their choice, that there is a social demand for a son but some imperceptible changes in the people’s perception regarding daughters is also taking place.



**f) Lack of Attention towards Maternal Care**

Maternal health is the health of women during pregnancy, childbirth and the postpartum period. The enabling environment for safe motherhood and childbirth depends on the care and attention provided to pregnant women and newborns by communities and families, the acumen of skilled health personnel and the availability of adequate health care facilities, equipment

and medicines and emergency care when needed. The health of mothers and newborns is intricately related. These include such as antenatal care, skilled attendance at birth, adequate nutrition, post-partum care, new born care.

According to NFHS-3 a high level antenatal care is received by the women in Sikkim from a health professional (64% from a doctor and 26% from any other health professional). With the rise in the level of education and standard of living it determines the increasing proportion of antenatal checkups of women from a doctor. According to RCH DLHS-2 survey it was common to find women below 35 years of age with antenatal checkups. But a large proportion of birth (52.5%) according to NFHS-3 is taking place at home. Also RCH DLHS-2 survey found 41% of delivery is taking place at home. This increase the risk of maternal mortality in the age groups 30-39 years and hence the cause of low sex ratio. During the RCH DLHS-2 survey it was found that 45% of the women stated that it was not necessary to deliver in the health institutions. Other than these factors the reason stated for not going to health institutions were its cost (3%), lack of transportation or remoteness of health facility (7%) shortage of time to visit (15%), batter care at home(18%),no permission from family(less than 1%),3 percent of people had no knowledge regarding the delivery facility. Only 48.5% (NFHS 3) of mother received a post natal care from a doctor/ nurse/ ANM/ other health personnel within 2days of delivery for their last birth. The post natal period is a critical period to the health and survival of a mother and her newborn. 51.5% of women do not receive post natal care which increases maternal deaths due to haemorrhage, sepsis, infection, retain placenta. This decreases the sex ratio in Sikkim considerably. Also majority of the deaths new born are due to low birth weight or premature deliveries who do not receive proper post natal care and attention.

This prompts the question of why majority of women do not use post natal care despite the fact many consider it necessary. The most frequent reason for not obtaining post natal care was that women did not feel sick and therefore they did not need post natal care, followed by not having told by doctor to come back for post natal care. Fewer women were not aware of the service availability, had no one to take care of the children or stated having experience with previous deliveries and therefore not needing additional information.



### **g) Health Hazard**

**1) Anaemia:** Women and children in Sikkim are prone to anaemia which is the major health problem. This is due to nutritional deficiency, where 31.4% of girls in Sikkim have mild anaemia, 27.4% have mild anaemia (NFHS-3) which has resulted in child mortality (girls), diminished physical and mental capacity, impaired cognitive performance, motor development and scholastic achievement.

Three-fifths of women in Sikkim have anaemia, including 42% with mild anaemia, 16% with moderate anaemia and 2% with severe anaemia (NFHS-3). Anaemia is particularly high among younger and pregnant women. 53% of pregnant women in the age group of 15-49 years have anaemia and 46.8% of ever married women in the age group of 15-49 years are anaemic compared to ever married men age 15-49 years where only 18.1% are anaemic. Prevalence of anaemia among pregnant women leads to maternal mortality leading to an unfavourable low sex ratio in Sikkim. Prenatal mortality, premature delivery, low birth weight of the child is more common to the women who are anaemic.

**2) Tuberculosis:** Tuberculosis is the most important infections causes of adult deaths after HIV/AIDS in low and middle income countries (Laxminarayan et al., 2007). Tuberculosis is the major health problem in the state of Sikkim. However in Sikkim somehow the problem seems to be increasing day by day and it has reached frightening proportions. Tuberculosis takes a disproportionately larger toll among young females, with more than 50% of cases occurring amongst females less than middle age group (Singh, 2014). Hill people do tend to be more prone to tuberculosis as compared to those in the plains (Sikkim Human Development Report, 2001, page -25). People here have a bad habit of spitting here and there. This helps the spread of bacteria especially in a cold climate. The prevalence rate of tuberculosis in Sikkim is high and women are likely to fall prey to this disease. 531 women per 100000 persons (NFHS-3) have tuberculosis in Sikkim. Women in households that use solid fuels (wood, peat, coal) for cooking (783/100000 persons) are more prone to TB than women using other fuel (389/100000 persons).

There have been an increase in the mortality rate due to a steady growth of drug resistant strains of TB. Some of the major causes behind the widespread prevalence of the disease may also be the hostile geographical location of the state, low level of awareness, poor living condition including

malnutrition, improper housing and sanitation, consumption of more liquor and less of nutritious food, eating of half cooked and uncooked meat by the hill tribes, and lack of commitment on the part of the medical practitioners. Clearly, the challenge of TB needs to be addressed on a priority basis, through both improved awareness and patient literacy as also greater resource allocation.

**h) Migration:** Migration is one of the most important factors which determine the sex ratio of a state. In-migration into Sikkim has become more conspicuous after Sikkim's integration with the Indian Union in 1975 and allocation of large amount of resources for developmental purposes. In Sikkim, the highest decline in the sex ratio was recorded in 1971-81 which coincides with the huge influx of male migrant workers. According to the Census data on migration, which primarily covers migration by place of birth and last residence, between 1971 and 1981 Sikkim recorded a very high level of in-migration (35 per cent). The proportion of male in-migrants has always been higher than that of women, although between 1981 and 1991 a decline was recorded (moving from 61 per cent in 1981 to 57 per cent in 1991).

### **Conclusion**

The findings of the paper reveal that the reasons for the declining sex ratio in Sikkim are very different from what we see in the mainland India. Female foeticide, which is considered as the most important factor for unbalanced sex ratio in the rest of India, has no relevance to Sikkim, where there is no prejudice against girl child. Here work load coupled with early marriages, loss of appetite, low nutrition intake, lack of attitude towards maternal care and tendency of women to serve their husband and children and having the leftover food are adding up to their poor health status of the women, and consequently leading to increased female mortality rate. Maternal mortality is high in Sikkim given the amount of work drudgery whether as cultivators or in the tertiary sector, Women suffer from anaemia and tuberculosis, which also affect the sex ratio of the state. Immigration of male workers has also been a contributing factor for lower sex ratio.

All these issues that contribute to low health status of women needs to be seriously analyzed with a bottom-up-approach. There is an urgent need to understand the role and linkages between women, health, education and optimum development for a favourable sex ratio.

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