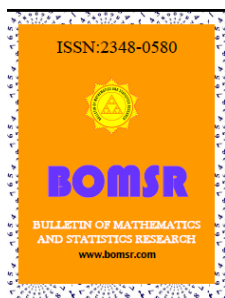**SURVEY ARTICLE**

FERTILITY DECLINE: A STATISTICAL DEMOGRAPHIC REVIEW OF PARSI COMMUNITY

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ABSTRACT

The present work is an appraisal of shrinking Parsi population. Parsi population is the only community in India which has experienced drastic decline in its population count over the time. While tracing origin and arrival of Parsis on Indian shores, spatio-temporal changes in fertility and temporal changes in mortality and population size are assessed. Comparative analysis for two different projection approaches for forecasting Parsi population up to the year 2051 by Shroff et. al (2011) and by Unisa et.al. (2008) is undertaken. Factors responsible for the depleting Parsi population are contemplated upon. Recent measures adopted by the government of India for addressing the issue of declining Parsi population are discussed.

1. PARSIS IN INDIA: A DIMINISHING POPULATION

India which is currently experiencing high population growth rate comprises of communities that have different kinds of demographic pattern (Axelrod, 1990). Parsis , non-Hindu religious minority, are perhaps the only community which has experienced dramatic population and fertility decline outside Europe (Coale, 1973; Coale and Watkin, 1986). India has one billion plus population characterized by wide cultural differences among different communities within the national territory (Kulke, 1974). Various population policies floated at different points in time over the past 60 years by the Indian government have offered incentives in various forms to its people for restricting family sizes, in order to arrest the rate of population growth. However, the Parsi community in India has consistently exhibited an exceptional decline in its population count.. The community members are not mandated to register births at a central Registry either under the aegis of the government or under that of the Bombay Parsi Panchayat- the apex body of the community. The prominent Parsi members, the Parsi Panchayat, and Registrar General of India had therefore appeald to all Parsis by making announcement in daily news papers, and in the Parsi publications like Parzor and Parsiana for participating in the census operation during 2001 census. Enumerators were also trained to record different names of Parsi community such as Parsi, Irani, Parsi Zoroastrian, Parsi Zarthoshti,

Parsi Irani Jarthoshti, Iranian Parsis to mention a few, through which they identify themselves (Banthia, 2003), for accuracy in data collection.

Parsi population strength was about 1,14,890 in the year 1941. Their census enumeration in 2001 was at 69,601. Consequently, the persistent decline pattern within the national boundaries have persuaded demographers, sociologists and policymakers to study and contemplate possible causes and corrective measures. A number of studies have documented their demographic graph and a few have postulated hypotheses regarding factors shaping them, based on crude birth rate figures and guess estimates , as no accurate data is available on Parsi births (Patel, 2011). Though very small in size, the progressive community has contributed substantially in the various spheres of economy, industry, banking, health care, education, research , philanthropy and social work. They were first in India to abandon child marriage practice. In India, Parsis have practiced endogamy and do not accept new converts to their faith (Visaria, 1974; Axelrod, 1980). There has been a legal precedent for the past century that the offsprings from the union of a Parsi man and a non-Parsi woman is accepted as a Parsi (Zoroastrian). However, offspring of a Parsi woman married to a Non-Parsi man is not considered as a member of the community.

2. HISTORICAL TRAJECTORY IN INDIA

The Parsis, the followers of Spitaman Zarathushtra founded about 2,500 years ago in Iran (Persia), are the original descendants of the ancient Persians who escaped to India around 640 AD (7th century) after the conquest of Iran by the Bedouin Arabs. They were provided shelter in the Indian subcontinent by the Hindu ruler Jadav Rana. Not much is known regarding the number of people who arrived or about their growth during the subsequent centuries except that initially they engaged in farming, weaving, and carpentry. During British rule, the East India Company assisted in a large scale migration of Parsis to Mumbai and brought them to prominence. India is home to the highest number of sacred fire temples and has largest collection of Parsi manuscripts. The only established Parsi Zoroastrian priestly seminaries in the world exist in Mumbai. In the year 2011, a sacred fire temple has been established in Delhi. World population of Zoroastrians is 1,50,000 comprising 1,00,000 in India, 12,000 in North America, 18,000 in Iran among others.

3. DEMOGRAPHIC TRENDS

The Parsis in India, have been enumerated separately since the first public census in 1872. During 60 years between 1881 and 1941 there has been slow but steady increase in the Parsi population. While census figures for 1881 gave a count of 85,397 Parsis in India, the 1941 census has reported nearly 114,890 Parsi individuals. The total world Zoroastrian population was estimated at 135,000 in the same period. Since then the statistical figures on demographics reflect similarity of the community with those of the developed countries and quiet opposite to the rest of India. Some salient statistical observations based on the census of 2001, which has classified the data (for the first time) on religious communities in India based on different age-groups, crude birth and death rate figures, male-female ratio as well as literacy and working population figures, are made as under:

1. Total Count – Parsis in India reached their highest ever census count in 1941 of 114,890 and since then, every decennial census has shown nearly a 10% decrease. In 1991 census, there were 76,382 and in 2001 its 69,601 a decline of 9% from 1991 and 40% decrease in past 60 years.

2. Growth Rate –The general Indian population has registered the growth rate of 21% whereas the Parsis have recorded a decline of 8.88%.

3. Male-Female Ratio –The general population sex ratio is 933, while the Parsi sex ratio is 1,050 which is also the highest among minorities in India.

4. Age Composition – This reveals an inverted pyramid. In 0-6 age group their population is mere 4.7% while for the general population it is 15%. In 1901, percentage of Parsi children in this age

group was 9.5% which means that in one century we have lost 4.8% implying a 100% loss. In the old age segment, Parsis over 60 years comprise 31% of the community contrasted to the national average of 7%. These figures are subject to verification of real birth rates, which have never been considered so far for Parsi population.

5. Crude Birth and Death Rates – According to 2001 census, Parsi crude birth rate is 6 per thousand and death rate is 16-18 per thousand. This implies that Parsis loose approximately 10 persons per year which for a population of 69,000 amounts to 690 annually or 6,900 individuals in a decade. However this fact is contrasted by the 1981 census figure which records 71,630 individuals and the 1991 figures which reveal 76,382 Parsis - a 9% increase in population, i.e. an increase of 4,752 Parsis, with constant death rates. In 2001 there is once more a decrease of 6,781 Parsis. Also, the period from 1981 to 2001 indicates that the decline in actual numbers is only 2,029 as per census figures and this makes it a 3% decline. This disparity casts doubts on data enumeration mechanism. The out-migration of 5,000 to 6,000 Parsis has also been ignored.

6. Literacy Rate – Parsis have highest literacy rate among all other communities which is 97.9 % according to 2001 census in India, while the national average is 64.8%.

7. Working Population – This is 35% which is substantially lower than the national average of 39.3% the reason being, dominance of 60 plus age group in the community.

8. Population Distribution – Parsis are a highly urbanized community such that 96.1% reside in urban areas while national urbanization average is 27.8%.

9. Fertility Rate - Fertility as reflected in annual numbers of births have declined.

10. **Demographic Features -**

Table 1: Decadal Growth rate of Population in India and among Parsis

Decade	All India	Parsis	Observation
1951-1961	20.40	-9.86	Marginal decline
1961-1971	24.80	-9.43	Marginal decline
1971-1981	24.66	-21.52(-5.75)	Drastic decline
1981-1991	23.86	6.63(-10.07)	Increase
1991-2001	21.34	-8.88(-10.02)	Marginal decline

Source: Unisa et. al (2008). Figures in parentheses are estimated growth rates.

Table 2: Sex ratio by religious groups, India, 2001

Religion	Sex Ratio
All religions	933
Hindus	931
Muslims	936
Christians	1009
Sikhs	893
Buddhists	893
Jains	940
Parsis	1050
Others	992
Religion not Stated	899

Source: Census of India, 2001

Table 3: Sex ratio among Parsis by Broad age groups

Age group	2001
0-14	908
15-59	1021
60+	1171
Total	1050

Source: Census of India, 2001

Table 4: Temporal shift in size of Parsi population, 1901-2001, India

Year	Persons	Male	Female
1901	94140*	-	-
1911	1,00,096*	51,123	48,973
1921	10,17,780*	52,355	49,423
1931	1.09,329*	56,366	52,963
1941	1,14,890*	58,248	56,642
1951	1,11,791	56,137	55,654
1961	1,00,772	49,425	51,347
1971	91,266	49,803	46,463
1981	71,630, (86,013)**	35.328	36,302
1991	76,382, (77,353)**	37,736	38,646
2001	69,601	33,949	35,652

Source: Unisa et. al (2008), *Undivided India,**Estimates based on reverse survival method using the age-group 0-9 of 2001 census.

The following observations from the above table are pertinent: During 1901 and 1941 there was a slow but steady increase in the Parsi population inspite of widespread famines and epidemics during this period, as they inhabited urban areas. Post 1941, Parsi population decline began, recording population growth of about 2 percent during 1941-51. The figures of 1951 census were affected by the partition of the country due to exclusion of Parsis who remained in the city of Karachi or other parts of Pakistan (including the present day Bangladesh). Data in the succceding table indicates a consistent downward Parsi population trend, which has potentially disastrous consequences for the future survival of the Parsi community.

Table 5: Parsi population 1881-2001

Census year	Parsis in Bombay/Mumbai	Parsis in India (Including Bombay/Mumbai)	Total Population of India	Percentage of Parsis to national population
1881	48597	85397	253891821	0.033635
1891	47458	89887	287314671	0.031285
1901	46231	93952	294361056	0.031917
1911	50931	100096	315156396	0.031761
1921	52234	101778	318942480	0.031911
1931	57765	111853	352837778	0.031701
1941	59813	114890	388997955	0.029535
1951	68660	111791*	361088090*	0.030959
1961	70065	100772	439234771	0.022943
1971	64667	91266	548159652	0.01665

1981	50053	71630	683329097	0.010483
1991	53794	76382	846302688	0.009025
2001	46557	69601	1028737436	0.006799

Source: (Kulke, 1974) and Registrar General of India, 2001.* 1951 Census onwards excludes population of areas that became Pakistan

11. Age Structure -The age structure of Parsis since the early 20th century has undergone a significant change, but it was similar to that of England and Wales (Chandra Sekar, 1948). In 40 years time (from 1961 to 2001), the percentage of population in the age group 65 and above got doubled. As a result, the percentage of those aged 65 years and above among Parsis (24.2 percent) was found higher than several developed countries like Sweden (17.4 percent), Spain (16.5 percent) and Japan (16.1 percent) around 2001. Further, the proportion of child population (12.3 percent below age 15 in 2001) is also very low. By the year 2001 *one in every eight Parsis was a child under 15 years, whereas every fourth Parsi was 65 years and above.* The present age structure of Parsi population is consequence of a very low fertility level coupled with a high proportion of aged population which shows the possibility of high death rate. It is observed that deaths have exceeded births in every year since 1955. 1961-70 was the first period when the TFR was found to be below replacement level (Visaria, 1974). Annual replacement ratios for the Parsis community ranging from the years 1955 to 1999 are computed as under :

Table 6 : Replacement ratios for Parsis Community

Year	Births	Deaths	Replacement Ratios
1955	788	878	0.897494
1956	817	902	0.905765
1957	807	1007	0.80139
1958	797	956	0.833682
1959	790	935	0.84492
1960	806	969	0.831785
1961	870	971	0.895984
1962	861	1001	0.86014
1963	844	1007	0.838133
1964	893	1078	0.828386
1965	856	1037	0.825458
1966	821	1027	0.799416
1967	812	1034	0.7853
1968	766	1016	0.753937
1969	730	1055	0.691943
1970	699	1084	0.644834
1971	692	1035	0.668599
1972	706	1057	0.667928
1973	677	1020	0.663725
1974	643	979	0.656793
1975	576	1010	0.570297
1976	520	1018	0.510806
1977	636	1059	0.600567
1978	648	1047	0.618911
1979	646	1084	0.595941

1980	646	1084	0.595941
1981	650	997	0.651956
1982	462	983	0.46999
1983	486	1020	0.476471
1984	570	1092	0.521978
1985	601	966	0.622153
1986	500	1027	0.486855
1987	580	974	0.595483
1988	620	1048	0.591603
1989	437	965	0.45285
1990	220	961	0.228928
1991	446	898	0.496659
1992	418	1053	0.396961
1993	447	1055	0.423697
1994	412	998	0.412826
1995	367	936	0.392094
1996	380	989	0.384226
1997	321	903	0.355482
1998	305	996	0.306225
1999	276	928	0.297414

Source: Hinnells, The Zoroastrian Diaspora, p. 48.

It can be noted that the Parsi birth rate is well below replacement level, which is necessary to sustain the community's population. The number of deaths each year overwhelmingly dominates the number of births for that specific year. The Parsi population in India has fallen from 76,382 to 69,601, and still declining. These figures are feared to be an over-estimation, as large number of never-married people, childless couples and one-child families due to late marriage or 'westernised' choice has ensured that the community is nowhere near the replacement level of 2.2 children.

Table 7: Percentage of population below age 14 in India and among Parsis

Year	% of population below age 14	
	Parsis	**India**
1961	17.8	41
1982	12.1	39.5
1999	10.4	35.3

Source: Parsi data refer to Greater Mumbai only and data are from 1961 census, IIPS survey, 1982 and TISS Survey, 1999. India data refer to censuses of 1961, 1981 and 2001 respectively.

Table 8: Percentage of population aged 65 and above in India and among Parsis

Year	% of population aged 65 & above	
	All India	Parsis
1961	3.1	11.7
1982	3.8	19.3
1999	4.8	23.8

Source: Data for Parsis refer to Greater Mumbai only. Parsis data are from 1961 census, IIPS survey, 1982, and TISS survey, 1999. All India data refer to censuses of 1961, 1981 and 2001 respectively.

12. Mortality -Downward trend in mortality among Parsis has been evident since 1881. Parsi death rate was low in comparison to the all India estimate during series of famines and plague epidemics

although they could not have totally escaped their effect (Desai, 1948; Visaria, 1974b). The death rate among Parsis in Bombay city fluctuated between 12 and 14 up to 1951 and has moved slightly upwards since then. The infant mortality was close to 30 per 1000 live births by late 1960s, a level that was attained by the United States only around 1962. (Visaria, 1974b) believes that further reduction in death rate has nearly exhausted due to fast ageing of Parsi population. The life expectancy at birth (e_x^0), derived from survey data using information on children ever born and surviving, has shown that life expectancy was nearly 70 years during 1972-77 and infant mortality rate was between 25-29 per 1000 live births which declined to 12 by the year 1980. Similarly, the life expectancy is estimated to be about 80 years at the close of twentieth century. The estimates of fertility and life expectancy presented above show that Parsis are a population characterized by a very high death rate (close to 15 per 1000 population compared to 9 at all India level around 2000) as well as one of the lowest low fertility in the recent decades. The fertility level (TFR 1.2; and CBR 9 per 1000 population around 2000) is much below the replacement level fertility (TFR 2.1), and ageing of the population is (24 per cent aged 65 plus) very acute. In such a demographic situation deaths are very likely to exceed births and the dwindling of the population is a demographic reality (Unisa et. al, 2008).

4. ASSESSING CAUSES FOR THE DECLINE

The first scholarly demographic study of the Parsis authored by (Chandra Sekar, 1948), found no evidence for low biological infertility and instead emphasized social and cultural factors, i.e. Parsi predisposition towards late marriage and non-marriage responsible for small size of Parsi community. (Axelrod, 1990) noted that Parsi women are not sub-fecund (more biologically infertile) and once, married, are able to bear children quickly and without difficulty. He also pointed to social, cultural, and attitudinal factors leading to low population growth rates within the Parsi community. Professional demographers have identified two significant causes for the dwindling numbers: Late marriage and Non marriage. Since the late 1940s, rates of late marriages and non- marriage trends have risen, resulting in the progressive decline of the young population in comparison to the aged population. As long as intermarriage rates remain high, and as long as the current system of accepting community members within its fold continues, it will be a cause for population decline. Out-migration to the West, particularly Britain, the United States, Canada is another significant factor responsible for thinning Parsi population within India.

4.1. Late Marriage

Parsis are progressive minded, and place high onus on education and standard of living .The first drop in Parsi fertility appears around the end of the 19th century with increasing rate of female education in the community after 1870 (Axelrod, 1990). A systematic shift in the age at marriage was observed in 1890 when most women married between the ages of 16 and 20, while, according to the 1901 census, about half of them married at ages over 20 (Axelrod, 1990). Though in 1940s the age group of 25-29 was the preferred marriageable age group (Chandra Sekar, 1948).

Table 9: Mean Age at Marriage (years), whole India versus Parsis

Year	Parsis*		All India	
	Male	**Female**	**Male**	**Female**
1961	31.1	26.8	21.3	15.9
1982	30.1	27.1	23.5	18.4
1999	30.6	26.8	24.9	19.7

Source: (i) 1961 census, IIPS survey (Karkal, 1982) and TISS Survey 1999(Singh and Gowri, 2000) (ii) All India figures are estimated based on information taken from 1961 and 1981 censuses and from NFHS-2.

*Mean age at marriage for Parsis refer to greater Mumbai only

In the above table, we observe distribution of mean age at marriage of Parsis with overall mean age at marriage in India, both for Males and Females. The age at marriage among Parsi women is about 27 years and among men it is about 31 years. Average age at marriage in 1962 was 26.5 years for women and 31.4 years for men, and has hovered at about this level ever since (Patel, 2010). In 1881, 37.25% marriages took place before the age of 15 years and 48.44% occurred between 16-50 years. By 1890, most Parsi women in Bombay married between the ages of 16 and 20, and by the 1901 Indian census, almost half of the Parsi women were marrying when they were over 20 years old. By 1930, the median age at marriage for a Parsi woman was over 24, and after that, between 26-27years for females and 31years for males which is also the current level indicative of sweeping social change that gave Parsi women greater freedom and access to education and employment. Therefore, there has been no significant increase or decrease in the mean age for marriage since 1931.

Table 10: Number of ever married women in the age group 15-44 per 1000 population

Year	Parsis	All India
1961	117	194
1982	95	176
1999	77	166

Source: Data for Parsis refer to Greater Mumbai only. Parsi data are from 1961 census, IIPS survey, 1982, and TISS survey, 1999. All India data refer to Censuses of 1961, 1981 and NFHS-2 respectively.

Three studies, all commissioned by the *Bombay Parsi Punchayat (BPP)*, confirmed this entrenched practice of late marriage. In 1961, the BPP requested the government of India to conduct a special study of the Parsi population in its decennial census. Census results indicated that the Singulate mean age at marriage (SMAM) – the average age for those who marry by the age of 50 was 31.2 for males and 26.8 for females. The two other *BPP – commissioned studies*, run in 1982 by Malini Karkal, a professor of Demography at International Institute For Population Sciences, and in 1999 by D.P Singh and V.Gowri, professors at the Tata Institute of Social Sciences; found the Singulate mean age at marriage to be roughly the same as it was in 1961.

4.2 Non-Marriage

Late marriage has had one significant consequence: it has increased the number of Parsis that have never married. Paul Axelrod, who in 1990 published one of the most interesting studies of Parsi demography, comments that, *"though Non-marriage is not always a direct result of late marriage, this seems to be so in the case of the Parsis"*. The studies of Axelrod, Visaria and many other demographers have studied in depth the rates of non-marriage within the Parsi population.

Between 1901 and 1941 the Parsi population of Bombay rose by 29%, marriages rose by only 22%. In 1881 close to 76% of all adult Parsis were married, but by 1931 only 41% were married (Kulke, 1974). This is corroborated by the fact that the proportion of women never married by then end of their reproductive period rose from less than 1% in 1881 to 17% in 1971 (Visaria, 1974). This trend has only got more pronounced, with a 1999 survey conducted by *Tata institute of social sciences* for the Bombay Parsi Punchayat (BPP- the apex and oldest association of the community showing that 30% of Parsi women remained unmarried throughout their lives (Patel, 2010). It is observed that at least for the past five decades, the trend amongst never-married Parsis under 50 has not markedly worsened. Nevertheless, the contrast between Parsi marital behavior and that of the general Indian population is quite striking. In Karkal's 1982 survey, 68.2 percent of women aged 20-29 reported that they had never married. For the general population of greater Bombay in 1971, this figure was 19.38 percent; for all of Maharashtra, it was 6.4 percent. A survey in 1973 showed that among women aged 31-45 years, 27% had never married (Axelrod, 1990).

Today's figure might be even higher. A BPP-commissioned study, found a decrease in the overall number of never married Parsis, but stated that it was simply because the overall number of youth; i.e., the number of people who were of a marriageable age, had diminished so greatly. *One out of every five Parsi India males, and one out of every ten females is still unmarried by the age of 50* (Unisa et. al., 2008)- a trend resulting in diminishing fertility and population.The westernization in the community has also been associated with a decrease in arranged marriage and a preference for choosing one's own marriage partner. In cohorts born before 1906, 67% of marriages were arranged, but by 1940, love-marriages were becoming a norm in the community and for cohorts born between 1946 and 1950 arranged marriages had fallen to 31% (Axelrod, 1990). Love-marriages were more prevalent among the wealthier, less orthodox Parsis born in Bombay. Parsi women are well educated as compared to their male counterparts and thus suitable partners according to their choice is not always available specially as a large number of males leave India for higher education and seldom return, leaving the pool of males available in India much smaller than it actually is. Women marrying late are restricted by the fertility biological clock and end up having fewer children or they tend to be past their fertility age. The small size of the community and the limited interaction among young Parsis in the city makes it difficult to find marriage partners, further pushing the average age of marriage or possibility of choosing option for non-marriage (Patel, 2011).

In 1890 Parsis accounted for less than 10% of the population of the city. This fact highlights overwhelming participation of Parsi women in attainment of education contrasted to the prevailing attitude towards women's education by the rest of India. The reasons for late marriage and non-marriage are best within the context of increasing urbanization, education, westernization and economic independence of women that began earlier than in other communities. Chief reasons for males remaining unmarried or delaying their marriage are low income, lack of accommodation, not able to find a suitable match, while women responses, are that of increasing independence, a dislike towards marriages, low-income among men and an inability to find a suitable partner. While these responses are indeed pertinent, these are only suggestive of the reasons for low nuptiality (Patel, 2011).

Table 11: Parsi female education

Year	Total Girls	Parsi Girls
1860	635	485
1909	73	34

Data Source: (Kulke,1974)

Table 12: Number of Ever Married Women in the age group 15-44 per 1000 population

Year	Parsis	All India
1961	117	194
1982	95	176
1999	77	166

Source: Parsi data refer to greater Mumbai only and data are from 1961 Census, IIPS Survey, 1982, and TISS survey. All India data refer to censuses of 1961, 1981 and NFHS-2 respectively.

Table 13: Percentage of males (50-54) remaining never married in India and among Parsis

Year	% of males (50-54) remaining never married	
	India	Parsis
1961	3.2	22.6
1971	2.6	18.1
1982	2.15	17.9
1999	1.3	20.6

Source: Data for Parsis refer to Greater Mumbai only. Parsi data are from 1961 census, IIPS survey, 1982, and TISS survey, 1999. All India data refer to Censuses of 1961, 1981 and NFHS-2. (Age 50+ from NFHS).

Table 14: Percentage of females (50-54) remaining never married in India and among Parsis

Year	% of females (50-54) remaining never married	
	India	Parsis
1961	4.71	19
1982	3.46	16.9
1999	0.6	9.4

Source: Data for Parsis refer to Greater Mumbai only. Parsi data are from 1961 census, IIPS survey, 1982, and TISS survey, 1999. All India data refer to Censuses of 1961, 1981 and NFHS-2. (Age 50+ from NFHS).

4.3 Low Fertility

The 2001 census puts the total number of Parsis at just 69,601 that's even less than 1% of the Indian population. Within the community, numbers fewer than 14 are only 12% while over 60 are 30% which is quite an alarming fact. In addition, the number of Parsi women in the age-group 15-44 who got married has been steadily falling. Between the years 1961-1999, it has come down to 35%. The same is also true of Parsi men, 20% reach the age of 50 without getting married. In 1999, the Parsi fertility rate was down to 0.94 and this cannot be compared to the rest of India as the Parsis are highly urbanized and their group needs to be evaluated with other groups sharing similar urban, economic and education levels. Therefore in Kerala where education levels are high there has been a similar decrease in birth rates. The census data documents the low marital fertility in the Parsi community.

There has been a great deal of speculation about the causes of low fertility in the community. The widespread use of birth control reported by Parsis suggests that family planning is indeed practiced perhaps more than in other communities. Extensive in-breeding may also be a potential source of sub fecundity. Though Dr. Anahita Pandole, a fertility expert, presently helping with the BPP fertility programme has observed that sub fecundity is not endemic in the community and the members are able to bear children quickly and without difficulty. Presumably late marriage is one of the motivating factors for the relatively short interval between marriage and first pregnancy. Indeed, there is an inverse relationship between age at marriage and interval between marriage and first birth in the Parsi community. However, the interval between the first and second birth is 3.62 years which suggest that intentional spacing is widely practiced among the Parsi, and other middle-class, communities. In fact, most Parsis who practiced family planning cited spacing, rather than pregnancy avoidance, as the most important reason for the practice. The health and freedom of the mother were also frequently cited as the primary reason for this. Thus, the Parsis offer a contrast to the Irish, who marry late, but among whom age-specific birth rates after marriages are quite high.

The pursuit of education for Parsi women has supposedly influenced low fertility than merely delaying marriage for a few years. The possibility of obtaining employment outside the home often postponed childbearing. Educated women were better informed about the practice of family planning, and their economic aspirations for their own children and a desire to maintain high standard of living further motivated them to have smaller families. Literature also suggests direct connection between specific socio-economic variables such as income, education and urbanization and fertility patterns. Thus, low fertility is a contributory component of the Parsi population decline and has to be seen in the context of community specific values (Shroff et. al., 2011).

Table 15: Percentage of childless women in age group 45-49 among Parsis

Year	Percentage
1982	16.7
1999	11.7

Source: Data refer to Greater Mumbai only. Estimates are from, IIPS Survey, 1982, and TISS survey, 1999.

Table 16: Estimated infant Mortality rate and life expectancy among Parsis

Year	Infant Mortality rate	Life Expectancy in Years (combined)
1972	29	69.9
1977	25	71
1980	<13	>75
1990	<13	>75
1995	<13	>75
1998	<13	>75

Source: Indirect estimation based on Children ever born and children surviving data of 1982 and 1999 surveys

4.4 Emigration

Emigration has been a prominent factor causing depletion in the Parsi numbers in India since the 1960s and 1970s to UK and USA. Out migration trends continued in the 1980s and more so in 1990s due to the technology boom. However, the approximate number of Parsis presently abroad totals to approximately 24000+ excluding those living in Pakistan, Iran and India. A large percentage almost 52-58% of these has originally migrated from India. The factor of outward migration has not yet been empirically analyzed only projections of it with no references are available with the census (Patel, 2011).

4.5 Out-marriages

Parsis consider out-marriages to be an important factor responsible for their population decline. Studies have shown that this has been on rise with each succeeding generation. Parsis consider themselves cosmopolitan and western in their outlook and since many Parsi women are employed outside the home, the chance to meet men of other communities has increased. Declining population is largely attributed to non acceptance of interfaith marriages by the community. Marriage outside the community is not encouraged and exclusion of offspring of a "mixed marriage is a norm. The orthodox believe that accepting children of girls married out will not increase the Parsi community as one is born a Parsi. At its core, the conflict is a manifestation of centuries-old anxieties and fears of assimilation and the loss of identity which is of great importance to a small community.

4.6 Separation and Divorces

Another trend which is noticeable, since last few years, is increasing number of separation and divorces. Every couple marrying, insist on having a separate home and thereby adding to more responsibilities in married life. Since both partners are educated and employed, they need to manage the household chores by themselves, or depend on servants. With no elders in the family, they are scared to have children and usually space them out depending on how best they can rear them. Since both are economically independent, the materialistic mind-set is difficult to change after marriage and each one seeks his/her pleasure without understanding the consequences. Under the prevailing circumstances, the birth of a child seems

more of a burden than the joy that should be experienced by the couple. One or two children is the basic norm, beyond which they cannot afford to sacrifice their leisured life. This causes the main strife and in no time severe quarrels start, first leading separate lives within the home and later, as it becomes intolerable, separation is the ultimate end. In some serious cases, divorces are desired. The increase in the number of cases in the Parsi-Matrimonial courts is its clear indication. This has also been a cause of anxiety among Parsis and a definite reason for low birth-rates (Patel, 2011).

5. TRACING FERTILITY RATES

5.1 Temporal pattern using CWR & TFR

As birth statistics are not accurately available from direct sources, indirect estimates of fertility based on Child Woman Ratio (CWR) are derived using census and survey data. The CWR of the 0-4/15 49 among Parsis was 182 per 1000 women in 1961, which declined to 134 children per 1000 women in 1999. This gives a clear indication of spectacular decline in the birth rate among Parsis in India. Total fertility rate (number of children born per woman) estimated indirectly using child woman ratios during 1980-82 was 1.12 among Parsis which is about half of replacement level and about four children lower than an average Indian. 20 years later in 2000, a further decline has been noticed as it dropped to below one child (0.94).

Table 17: Estimated Total Fertility Rates and Child Women Ratio (0-4/15-49) from Greater Mumbai

| Year | Parsis | | All India | |
	CWR	TFR	CWR	TFR
1961	182	1.51	659	-
1982	166	1.12	545	5.2
1999	134	0.94	211	3.2

Source: 1961 census, IIPS survey (Karkal, 1982), TISS survey 1999 (Singh et. al., 2000), All India data refer to censuses of 1961, 1981, 2001 respectively

5.2 Temporal pattern using CBR

In 1881, when the first comprehensive Indian census took place, Parsi fertility rates were, according to Leela Visaria "moderately high". That year, the birth rate was tabulating as 34 per 1000 population for Parsis in Bombay. This had fallen to 14 per 1000 population by the time Chandra Sekar wrote his study in the late 1940s. It has continued to decline consistently since then. By the 1960s, it had slid to 12 per 1000 population for Parsis. In comparison crude birth rate for the general Indian population was still 38 per 1000 population in 1970. According to another indicator gross reproduction rates (GRR), Parsis fertility Rates were already below replacement level in 1961.

Table 18: Crude birth rate for Parsis

Year	CBR (per 1000)
1986-1991	9.4
1991-1996	7.8
2000-2001	6.4

Source: CBR estimated based on reverse survival of 0-9 age distribution from 2001 census data

A study sponsored by National Commission for Minorities Government of India, New Delhi published as a research project Report titled " All India Birth Rate of Parsi-Zoroastrians from 2001 till 15th august, 2007" presents the number of births for years 2001 to 15th August, 2007 (see table 19) wherein the highest number of births were observed in January 2001, and the lowest recorded birth count corresponds to October 2005. Also, the highest birth count is in year 2001 and the number of

births are showing a declining trend till 2003 followed by slight increase from 177 to 189 during 2004 which plummets again from 189 to 171 in 2005 registering a rise in 2006. The season wise fragmented data thus shows a disturbing feature for future of the dwindling Parsi community. Consistent trend in birth occurences are observed except for the years 2001 and 2002.

Table 19: Census of Zoroastrian infants with month-wise distribution per year

Month Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Au	Se	Oc	No	De	Total
2001	26	16	16	18	11	10	21	13	24	23	21	24	223
2002	17	14	17	18	14	16	18	15	16	23	23	15	206
2003	10	15	16	10	14	10	18	11	15	19	18	21	177
2004	18	10	13	15	16	17	15	13	15	23	14	20	189
2005	12	15	16	13	16	9	15	10	14	7	24	20	171
2006	17	9	10	16	13	20	17	9	17	20	13	13	174
Up to 15 Aug 2007	8	11	12	14	9	20	12	13	-	-	-	-	99

Source: Research Project Report sponsored by National Commission for Minorities Government of India

5.3 Spatial Tendencies

Statistics report TFR for Spain as 1.2, Japan as 1.4 and Sweden as 1.6 in 2000 and for India as 2.58. TFR measures the number of children born per woman and a TFR of 2.1 is necessary for replacement. This gives a clear indication of the spectacular decline in the birth rate among Parsis. The Parsis who were residing in the state of Maharashtra had the lowest fertility compared to those living in Gujarat and other parts of country. Since a majority of the Parsi population (nearly 80%) is living in Maharashtra, their lowest fertility has contributed to the overall decline in Parsi population in India.

Table 20: Total Fertility Rate and Child Woman ratio by major states of their concentration, 2001

	CWR(5-9/20-49)	TFR(1994)*	CWR(0-4/15-49)	TFR(1999)*
All Parsis	181	1.23	149	1.0
Parsis in Maharashtra	173	1.17	140	0.91
Parsis in Gujarat	206	1.41	186	1.27
Parsis in rest of India	224	1.53	218	1.5

Source: (Unisa et. al, 2008)

*Estimated using child woman ratio based on Rele's method (Rele 1967).

6. DEMOGRAPHIC TRANSITION

Unisa et. al. (2008) have studied transition and trepidation in the strength of Parsi community by projecting future Parsi population with different fertility scenarios and constant mortality pattern. Component projection method is used, by choosing input of fertility as TFR and input of mortality as life expectancy at birth (e_x^0). Influence of migration is ignored.

6.1 Fertility

Three types of projections were made under different scenarios of fertility as follows:

I. For the first type of projection, it was assumed that TFR would decline from 1.0 in 2001 to 0.75 in 2051.

II.   Second projection is made under assumption that the current rate of decline in fertility continues where TFR is considered constant at 1.0 from 2001 to 2051 presuming that there will be no further decline in fertility.

III.   In the third projection, it is assumed that TFR will increase from 1.0 in 2001 to 1.4 in 2011, to 2.1 in 2021, and will remain constant at 2.1 afterwards(this scenario is possible only when efforts will be made by the community to increase their fertility and proportion of married women).

6.2 Life Expectancy

The life expectancy representing mortality scenario is same in all the three projections, i.e. for males it will increase from 75 to 83 years and for females from 76 to 85 years during 2001 to 2051.

a)   In 2051, projection-I showed a decline of about 53.6 percent, i.e., from 69,000 in 2001 to 39,000 in 2051.

b)   The figures in second scenario (projection II) revealed comparatively slower decline than that under projection-I. In other words, the pace of decline is observed at the rate of one percent per year up to 2051.

c)   The projected figures under third scenario are still showing a decline in spite of the assumption of increasing fertility. However, the pace of decline is reduced from 1 percent in second scenario to 0.6 percent per in third scenario in the next 50 years by 2051.

Thus the projected figures of the Parsi population in this study indicate the choices the Parsi community has to make in order to continue their existence.

Table 21: Projected Parsi population

Year	Projection-I	Projection-II	Projection-III
2001	69	69	69
2011	61	61	62
2021	53	54	57
2031	46	47	53
2041	39	40	49
2051	32	34	47

Source: Unisa et. al (2008)

7. PROBABLE IMPACT OF INTERMARRIAGE

7.1 Projection Scenarios

Shroff et. al. (2011) have undertaken population projection for the period 2001-2051, using cohort component method and assuming a closed population (no migration) for a five-year interval. Three distinct projection Scenarios outlined on the basis of intermarriage were:

(i)   *Current Trends :* The first describes the status quo situation: children of Parsi women married out of the community are not accepted within the fold, while children born of Parsi men and non-Parsi women are included.

$P_{current} = P_{base} + (Births)_{Both \ Parsi \ Parent} + (Births)_{Parsi \ Father , Non-Parsi \ mother} - (Deaths)$

(ii)   *Accept all children :* The second scenario allows the acceptance of children of Parsi women married outside the   community.

$P_{current} = P_{base} + (Births)_{Either \ Parsi \ Parent} - (Deaths)$

(iii) *No acceptance of intermarriage :* Finally the third scenario considers a stricter rule of intermarriage in which children of both men and women married outside the community are excluded.

$$P_{current} = P_{base} + (Births)_{Both\ Parsi\ Parent} - (Deaths)$$

Each of these three scenarios were also evaluated under varying schedules of fertility and intermarriage rates as follows:

i. *Assuming* constant rates of mortality, fertility and intermarriage throughout the entire projection period.

ii. *Assuming* constant rates of mortality and intermarriage, but considering that fertility would experience an immediate one- time doubling from current levels.

iii. *Assuming* constant rates of mortality and intermarriage, but considering that fertility would experience an immediate trebling from current levels; and

iv. *Assuming* constant rates of mortality and fertility, but considering the rates of intermarriage would double from current levels, which serves as baseline.

Table 22 : Assumptions for each of the three population projection scenarios

Assumptions

Variables	(i)	(ii)	(iii)	(iv)
Mortality	$e_0^{Females} = 77.7$ $e_0^{male} = 73.$	$e_0^{Females} = 77.7$ $e_0^{male} = 73.5$	$e_0^{Females} = 77.7$ $e_0^{male} = 73.5$	$e_0^{Females} = 77.7$ $e_0^{male} = 73.5$
Fertility (T.F.R.)	.89	1.78	2.67	0.89
Intermarriage (% of total marriage)	32.09	32.09	32.09	64.18

Under assumption (i), the projection exercise indicates that the Parsi population of Mumbai is expected to significantly shrink by 2051, revealing a much older age structure.

(a) If social acceptance of intermarriage remains unchanged, the projection predicts that *the population would decrease from the 2001 figure of 46,557 to 20,122 in the year 2051.*

(b) Including all children of intermarriage has only a marginal role in stemming this decline, resulting in a projected population of 20,535 in 2051.

(c) However on considering that no children of intermarriage (male or female marrying outside the community) are accepted the projected population would be reduced to 19,136 individuals in Mumbai in 2051.

These findings suggest that changing social norms, on their own, have a negligible impact on slowing the population decline.

Under assumption (ii), which considers a TFR twice as big as the 2001 level, the projected decline of Parsi population would be less pronounced.

(a) Under the assumption of no social change in the acceptance of children of intermarriage ('current *Trends'*), the population would be reduced to 31,756 in 2051.

(b) Acceptance of all children of intermarried Parsis would leave the population at 32,911 in 2051.

(c) 'No acceptance of intermarriage' would result in the community shrinking to 29,036 individuals in 2051.

Considering a TFR three times as big as that observed in 2001, assumption (iii) has the potential to lead to a maintenance and possible revival of the Parsi community of Mumbai.

(a) The scenario of no social change leads to an estimate of 47,116 in 2051.

   (b) Under this assumption there is a common pattern in the population projection of all three scenarios of intermarriage, *which shows an initial drop followed by a distinct revival*.

   (c) The extent of the revival appears to be affected by the acceptance. Acceptance of all children would result in a decline in population to 43,971 in 2031 and then a rise to 49,344 in 2051. Under the non acceptance scenario the population would decline to 40,763 in 2036 and then grow to 41,913 in 2051.

Doubling the number of men and women marrying out of the community, assumption (iv), had little impact on the overall trend, since the number of non-Parsi women giving birth to Parsi children more than compensates for the increased out marriage.

   (a) Under the scenario of no social change the population would reduce to 20,215 in 2051.

   (b) Acceptance of all children of intermarried Parsis would leave the population at 21,052 in 2051.

   (c) The scenario of a total non-acceptance of children of intermarriage would result in the community shrinking to 18,277 individual in 2051.

7.2 Limitation of the Study

This study had the following limitations:

First, the baseline population for the projection taken from the 2001 census of India includes some Parsi women married outside the community. Therefore the projection will *over-estimate* the population, since the existing children of these women would not be counted in the community. However since the baseline population is the same for all scenarios and assumption, the final comparison between *projected numbers is not compromised*.

Second, the assumption that the age distribution of women marrying outside the community is similar to that of women marrying Parsis can bias the estimates in both directions. On the other hand, younger women may be more liberal and willing to marry out of the community; on the other hand, intermarriage could be the result of not finding a suitable Parsi partner, and therefore more likely to occur among older women. If women marrying non- parsis are younger than those marrying Parsis, then the *projections underestimate* the impact of intermarriage since these women are exposed to the possibility of having children for a longer time. If they are older, the *projections overestimate* the number of children lost to the community since these women would have fewer children as a result of late marriage. Data on the age of men and women marrying outside the community would need to be collected to be able to make a definite statement about this and is a fruitful to pick for future research.

Finally, the model uses the assumption of a closed community to make projections. In the scenario of the net migration out of Mumbai this would lead to *projections overestimating* the future Parsi population in the city, particularly if the migration is among the younger section of the community. It is important to note here that emigration would only alter the impact of intermarriage on the population decline if rates of emigration among those marrying outside the community can be shown to be substantially different from those marrying within the community. There is no data on number of Parsis emigrating from Mumbai each year, and even less a breakdown of this by age group. This would be *needed to make an accurate assessment* of the impact of emigration on the rate of Parsi population decline, by including this data in a projection model.

8. COMPARISON OF STUDIES

Comparative analysis for the two different projection approaches for forecasting Parsi population up to the year 2051 reveal that the projected population by Shroff et. al (2011) for scenario I under assumption (iii) agrees with the projection by Unisa et. al (2008) under scenario III, otherwise Unisa et. al (2008) projected values overestimated the Parsi population as compared to

projection done by Shroff et. al (2011). Both approaches follow the traditional Cohort Component Method for projection. The difference lies in the assumptions and scenarios taken by both the authors. Unisa et. al (2008) have considered three fertility scenarios whereas Shroff et. al (2011) have projected Parsi population based on Fertility, Mortality and Intermarriage rates. It should be noted that the projection is done on basis on 2001 census count of Parsis which is 46,557.

Table 23 : Unisa et. al. (2008) projected values for the year 2051

Year	I	II	III
2051	32,000	34,000	47,000

Table 24 : Shroff et. al. (2011) projected values for the year 2051

Assumptions/Scenarios	(i)	(ii)	(iii)	(iv)
I	20,122	31,756	47,116	20,215
II	20,535	32,911	49,344	21,052
III	19,136	29,036	49,913	18,277

9. PLANNING AND INTERVENTIONS BY THE GOVERNMENT

In view of the massive decline in the population figures for the Parsi community, an ambitious programme is launched with the assistance of the central government in India. A historical initiative has been taken recently (2013, Sept) by the ministry of Minority Affairs, government of India to transform the lives of minorities residing in India. "Jiyo Parsi" is a part of this community driven initiative, which graphs a scheme for containing population decline of Parsis in India. This scheme is coordinated by Parzor Foundation and Bombay Parsi Panchayat. The key features of the scheme encompass promoting measures to contain population decline of Parsi community in India. The target groups comprise of

(a) Parsi married couples of child bearing age who seek assistance.
(b) Adults/ young men/ women/ adolescent boys/ girls for detection of indications for infertility with prior consent of parents/legal guardians.

Mechanism for implementing various aspects of the initiative comprises of:

(a) Medical interventions under Standard Medical Protocols in empanelled hospitals /clinics.
(b) Advocacy/outreach programmes with participation of the Parsi community.
(c) Confidentiality of the patients to be given utmost importance.

Demographic planners and policy makers expect reversal of trends for declining Parsi population by recording higher fertility among the rapidly vanishing Parsi community, through the above assistance.

10. CONCLUSION

The percentage of the Indian Parsi population *above 65* stood at 24.2%, which was well above the projection figures for Japan, Spain and Sweden. The United Nations defines a population as aged if more than 7% of its population is *above 65*. The proportion of aged Parsis is over triple this amount. If these trends continue – if fertility rates continue to fall and if the percentage of elderly increases, then the coming and new generations of Parsis would become smaller and smaller in size. The anxious thought is: what will happen to the community in a few decades from now? In other words, the population will be less than half of what it is today. Shroff 2010, projects that the Parsi population of Bombay, which was 46,557 in 2001, will decline to 20,122 in 2051.We recall, that roughly 70,000 Parsis called Bombay home in 1971(Unisa et al, 2008). By 1980-82, the TFR for Parsis was already 1.12, i.e., about half of replacement level. In 2000, it was 0.94. Low fertility as chiefly responsible for the dramatic decrease in the Parsi Population. Therefore, only a dramatic increase in

fertility can arrest this trend and bring about the existence of a viable and demographically stable Parsi community in Mumbai.

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