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Demographic Profile of the High-and Lower-Altitude Monpas in Arunachal Pradesh, India

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Abstract

The present study – which is primarily descriptive in nature – gives a brief demographic profile of the Monpas at lower (<2,500 metres above sea level) and high (≥2,500 metres above sea level) altitude in Arunachal Pradesh with respect to population size, composition, and sex distribution. Data were collected from 340 lower altitude households and 171 high altitude households using household schedules. Overall, the present study suggests that there is not much variation between Monpas of lower and high altitudes in respect of demographic parameters. The findings may be attributed to the relationship of population structure of the Monpas with education, income, or even to geographical distribution of the Monpa's population in Arunachal Pradesh. However, due to small sample size in the present study - especially of high altitude - it is important to note that there is a scope for future study with respect to demography of the Monpas at low and high altitude.

Keywords: *Altitude, Demography, Monpas, Socio-Economic Conditions.*

Introduction

Demography is the study of population, its structure, composition, and distribution, considering important parameters such as sex, age, density, birth and death rate, growth, and division of population. Population distribution is a dynamic process (Clark, 1973) and analysis of population distribution and density is fundamental for understanding human geography (Chandana & Sidhu, 1980); and well as through using of

anthropological theory and methods to provide better understanding of demographic phenomena in current and past populations (Bernardi & Hutter, 2007). Earlier studies have shown that anthropological study of demographic aspects of a population are likely to bring light on some useful estimates of general population trend which is very useful supplement to the formal demographic research and socio-economic planning (Macfarlane, 1976; Nag, 1981).

In India, many studies have been conducted on the ethnic-demographic variations among the endogamous populations living in different ecological conditions i.e., at rural, urban, as well as tribal populations (Langstieh, 2001). According to Census of India (2011), Arunachal Pradesh has a total population of 1,383,727 persons, comprising of 713,912 males and 669,815 females with a sex ratio of 938 females per 1000 males. The density of population is 17 persons per sq km. Tawang district has a total population of 49,977 persons, it is the eighth least populous district in the country. The density of population is 23 people per sq km. The sex ratio of the district is 714 females per 1000 males and the average literacy rate is recorded at 59%. With a total population of 83,947 persons, West Kameng on the other hand, stood eight largest districts in the state by population. The district has a sex ratio of 819 females per 1000 males. The density of population is 11 people per sq km and the average literacy rate is 67.07%. The present study - which is primarily descriptive in nature - gives a brief demographic profile of the Monpas at lower and high altitudes of Arunachal Pradesh with respect to population size, composition, and sex distribution.

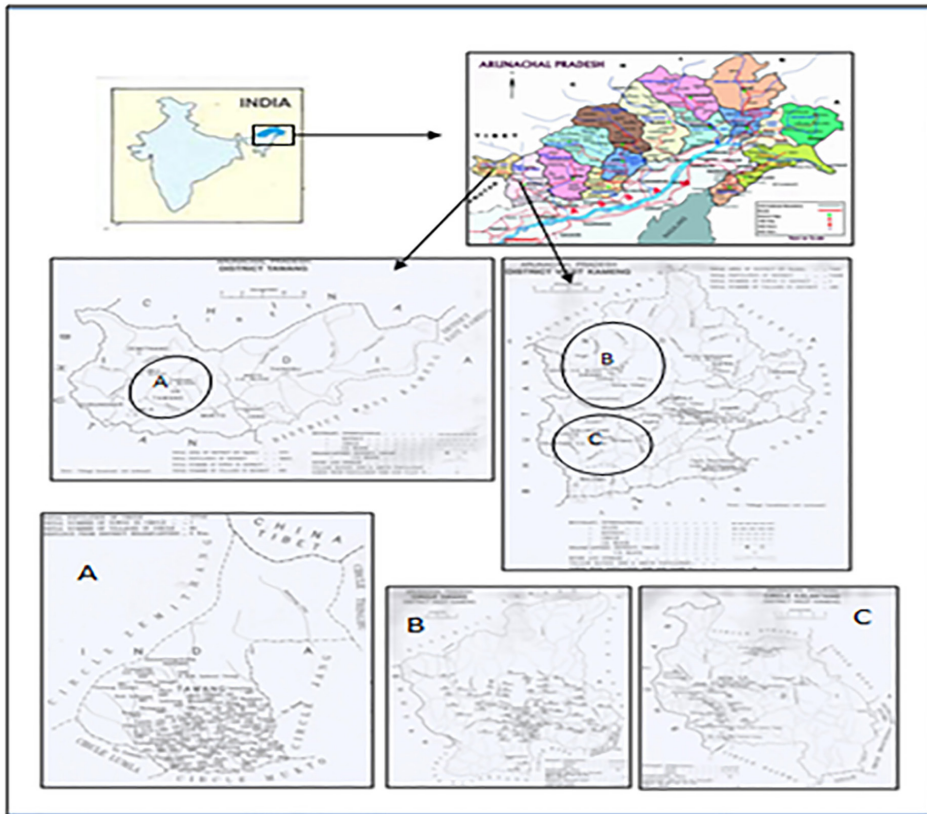
Objective

To describe the demographic structure of the lower and high altitude Monpas of West Kameng and Tawang districts of Arunachal Pradesh respectively.

Study Area and Population

The present study was conducted among the Monpas, one of the major tribal groups in Northeast India, who are mainly distributed at Tawang and West Kameng districts of Arunachal Pradesh (Figure 1). Tawang district occupies an area of 2,172 sq. km.

(Diyawanti, 2010) and is located between latitude 27°45'N and longitude 90°15'E in the northwest extremity of Arunachal Pradesh. The elevation of the district ranges between 6000 ft (1828.8 meters) to 22,000 ft (6705.6 meters) above the mean sea level, and the inhabitants are generally found at lower altitudes, where they enjoy a cool temperate climate.



Source: Census of India, 2001.

Fig. 1: Location of the Study Areas: (A) Tawang Circle (B) Dirang Circle (C) Kalakatang Circle

West Kameng district on the other hand, occupies a total area of 7,422 sq. km. and lies approximately between 91°30' to 92°40' E longitudes and 26°54' to 28°01' N latitudes. The altitude of the district ranges from 213 metres above sea level at Bhalukpong to 7090 metres above sea level at Kangte (Krishi Vigyan Kendra, 2016). The

population figures of the study area are given in Table 1.

Table 1: Population Figures of the Study Area

District (Pop.)	Circle (avg. alt.)	No. of Town /City	No. of Village	No. of House-hold	Total Popula-tion	Male Popula-tion (%)	Female Popula-tion (%)	Sex Ratio (female / 1000 male)	Lit-eracy Rate (%)
Tawang (49,977)	Tawang (2947 m)	01	63	3,470	19,099	12,463 (65%)	6,636 (35%)	532	72%
West Kameng (83,947)	Dirang (1580 m)	01	88	4,144	18,401	9704 (53%)	8697 (47%)	896	49%
	Kalaktang (1113 m)	01	23	1,529	6,622	3369 (51%)	3253 (49%)	965	50%

Source : Census of India, 2011.

Materials and Methods

Data were collected at different intervals from different Monpa villages of Kalaktang, Dirang, and Tawang circles during the period between September, 2012 and August, 2015. Tawang circle was selected purposely as high-altitude area (2947 m above sea level). Data were also collected from lower altitudes, namely, Kalaktang (1113 m above sea level) and Dirang (1580 m above sea level) circles. 10 % of the total villages from each circle were selected using random numbers of the listed villages (Snedecor and Cochran, 1967). The selected villages from Tawang circle include Lemberdung, Thongleng, Katchanga, Urgeling, Khirmu, Damgin, Kongteng, Seru, and Kitpi village. From Kalaktang circle, Chingi, Rongthangjurpa, Ankalin, Boha, Khungpazong and Lungdur villages were selected. From Dirang circle, five villages namely, Rama Camp, Sapper Camp, Rungkhung, Kalapahar, and Pangma were randomly selected. No statistical sampling method was applied at the household and individual levels. However, households and individuals who were willing to co-operate in the present study were included. 340 lower altitude households and 171 high altitude households were covered. Household schedules were used for collecting information on age, sex, marital status, religion, occupation, place of birth, place of residence, etc. from the heads of the house-

holds or elder members who were capable of furnishing all the relevant information. Data on income and education were drawn from selected interviewees. The differences between proportions were tested using the chi-square (χ^2) test.

Socio-economic Variables

Income Groups

Data on household income (INR [Indian Rupee]) were collected directly from the heads of the households and were cross-checked taking into consideration some aspects of socio-economic conditions such as housing condition, types of occupation, land holding, and monthly expenditure. The per capita monthly income of the households above 75th percentile (>Rs. 4167) was categorised as High-Income Group (HIG), between 50th to 75th percentile (Rs. 3333-Rs. 4167) as Middle-Income Group (MIG), and below 50th percentile (< Rs. 3333) as Low-Income Group (LIG).

Educational Level

Data on educational qualification of individuals were arbitrarily classified as Illiterate which includes those individuals who were unable to read and write and those who had no formal education. Individuals who attended school up to standard V were grouped into Primary level of education. Those individuals with educational level from standard VI to X were categorised as Secondary; whereas, those with educational qualification of standard XI and above were grouped under Above Secondary category.

Result

Age-Sex Distribution

Table 2 shows the percentage distribution of the study population by age and sex. It was found that 33.08%, 58.90%, and 8.02% of the Monpas at lower altitude (Kalkatang and Dirang circles) belonged to the age group 0–14, 15–49, and 50+ years, respectively. At high altitude (Tawang circle), these proportions were found to be 22.09%, 68.11%, and 9.80%, respectively. According to Sunbarg's classification of population, the Monpa population at high altitude may be categorized as regressive type, whereas the Monpa population at lower altitude appears to be stationary. In other words, the

Monpa population at high altitude tends to be decreasing, but that at lower altitude was neither decreasing nor increasing during the last 10 years or so.

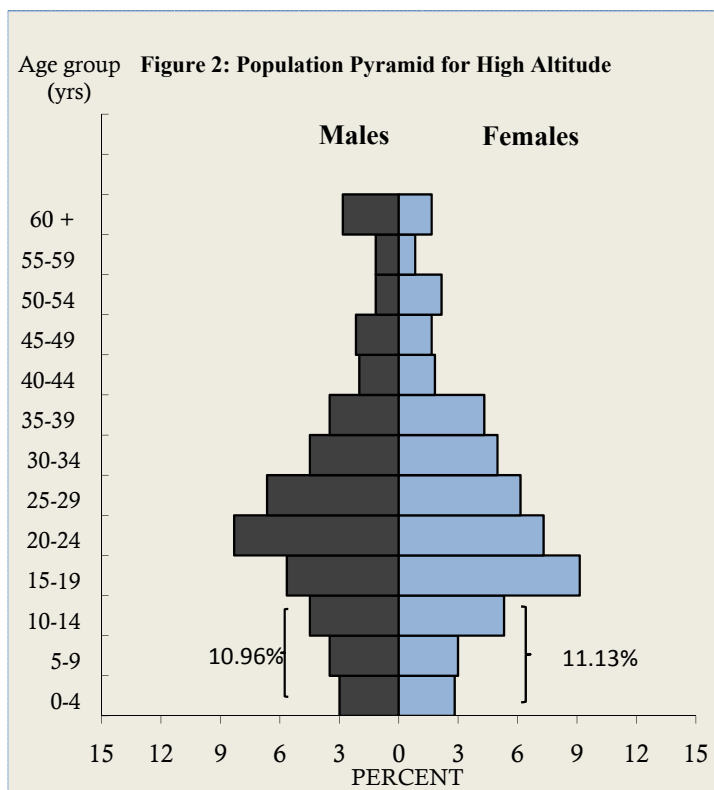
Population Pyramid

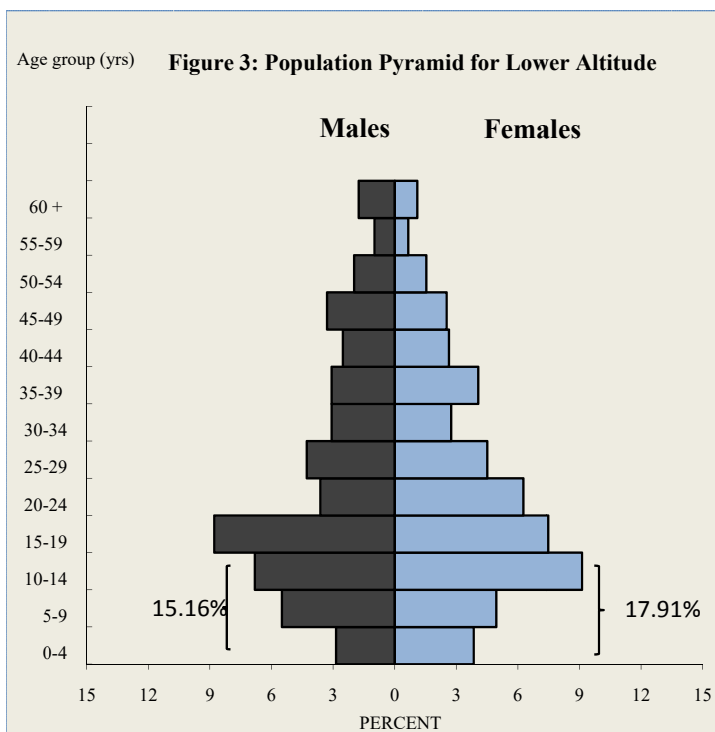
The population pyramids for high and lower altitudes are shown in Figures 2 and 3, respectively. These population pyramids were based on age groups of 5 years interval. Considering the age group 0–4 years as the base, it is seen that both lower and high altitude Monpas are characterized by population pyramids with shrinking bases. This indicates that fertility rate during the last 10 years or so was decreasing at both lower and high altitudes, and it is more in the case of Monpas at high altitude. As a result, the Monpa population at high altitude tends to be regressive. The pyramids also depict that the fertility rate among the of Monpas lower and high altitudes has decreased considerably during the last decade or so.

Table 2: Age, Sex, and Total Population of Monpas at Lower and High Altitudes

Age groups (years)	Lower Altitude			High Altitude		
	Male	Female	Total	Male	Female	Total
0–4	52	70	122	18	17	35
5–9	100	90	190	21	18	39
10–14	124	166	290	27	32	59
Total (0–14)	276 15.16%	326 17.91%	602 33.08%	66 10.96%	67 11.13%	133 22.09%
Sex Ratio (0–14)	84.66 males per 100 females $\chi^2 = 4.15, p < 0.05$			98.51 males per 100 females $\chi^2 = 0.42, p > 0.05$		
15–19	160	136	296	34	55	89
20–24	66	114	180	50	44	94
25–29	78	82	160	40	37	77
30–34	56	50	106	27	30	57
35–39	56	74	130	21	26	47
40–44	46	48	94	12	11	23
45–49	60	46	106	13	10	23

Total (15-49)	522 30.33%	550 30.22%	1072 58.90%	197 32.72%	213 35.38%	410 68.11%
Sex Ratio (15-49)	94.91 males per 100 females $\chi^2 = 0.73, p > 0.05$			92.49 males per 100 females $\chi^2 = 0.62, p > 0.05$		
50-54	36	28	64	7	13	20
55-59	18	12	30	7	5	12
60+	32	20	52	17	10	27
Total (50+)	86 4.73%	60 3.30%	146 8.02%	31 5.15%	28 4.65%	59 9.80%
Sex Ratio (50+)	143.33 males per 100 females $\chi^2 = 4.60, p < 0.03$			110.71 males per 100 females $\chi^2 = 0.15, p > 0.05$		
Grand Total	884 48.57%	936 51.43%	1820 100%	294 48.84%	308 51.16%	602 100%
Overall Sex ratio	94.44 males per 100 females $\chi^2 = 1.49, p > 0.05$			95.45 males per 100 females $\chi^2 = 0.33, p > 0.05$		





Sex Ratio

On the basis of household census covered under the present study, there are altogether 2422 individuals of which 1820 are at lower altitude and 602 at high altitude (Table 2). Among the Monpas of lower altitude, there are 884 (48.57%) males and 936 (51.43%) females, with a sex ratio of 94.44 males per 100 females, which is not significantly lower than the ideal sex ratio of 1:1 ($\chi^2 = 1.49$, $df = 1$, $p > 0.05$). On the other hand, the overall sex ratio at high altitude is 95.45 males per 100 females. This sex ratio at high altitude is also not significantly different from the ideal sex ratio of 1:1 ($\chi^2 = 0.33$, $df = 1$, $p > 0.05$). On the basis of these findings, we may suggest that the overall sex ratio in the Monpa population is tilted towards females at both lower and high altitude which indicates greater mortality or out-migration in males than in females.

In the age group 0–14 years, the sex ratios are 84.66 and 98.51 males per 100 females at lower and high altitudes, respectively. In comparison with the ideal sex ratio of 1:1, the sex ratio at lower altitude is very low, and it is statistically significant ($\chi^2 = 4.15$,

df = 1, $p < 0.05$); whereas the sex ratio at high altitude is by and large similar to the ideal sex ratio ($\chi^2 = 0.42$, df = 1, $p > 0.05$). Therefore, it is clear that there is low proportion of males in this age group as compared to females at lower altitude, thereby indicating a higher mortality rate in males before reproductive age.

In the age group 15–49 years, the sex ratio at lower altitude is 95 males per 100 females. Although it looks as low, the chi-square test indicates that it does not significantly deviate from the ideal sex ratio of 1:1 ($\chi^2 = 0.73$, df = 1, $p > 0.05$). Similarly, the sex ratio at high altitude (92.49 males per 100 females) is lower than that at lower altitude, but it is not significantly different from the ideal sex ratio ($\chi^2 = 0.62$, df = 1, $p > 0.05$). Although, the present sample size may be small, it suggests that male mortality in the age group 15–49 years is much higher at high altitude than that at lower altitude.

The sex ratios in the age group ≥ 50 years were found to be 143 and 111 males per 100 females at lower and high altitudes, respectively. The number of males per 100 females in this age group is higher especially at lower altitude. The chi-square test also suggests that the deviation from the ideal sex ratio is highly significant at lower altitude ($\chi^2 = 4.60$, df = 1, $p < 0.03$), although it is not significant at high altitude ($\chi^2 = 0.15$, df = 1, $p > 0.05$), perhaps due to small sample size. So it is evident that the female longevity in Monpa population of the present study is much shorter than that of male after 50 years of age. These sex differences might be mainly because of female out-migration or mortality during adulthood that may be associated with different socio-economic factors.

Table 3 : Marital Status of the Individuals by Age Groups

Marital Status by age groups	Lower altitude		High altitude	
	Male	Female	Male	Female
<u>< 25 years</u>				
Married	10 (2.91)	42 (12.14)	2 (2.02)	6 (5.61)
Unmarried	492	528	142	158
DSW*	0	6 (18.75)	0	1 (5.26)
<u>25–29 years</u>				
Married	52 (15.12)	56 (16.18)	8 (8.08)	15 (14.02)
Unmarried	24	24	32	17
DSW*	2 (14.29)	2 (6.25)	0	5 (26.32)
<u>30–34 years</u>				
Married	46 (13.37)	44 (12.72)	21 (21.21)	22 (20.56)
Unmarried	6	6	6	6
DSW*	4 (28.57)	0	0	2 (10.53)
<u>≥35 years</u>				
Married	236 (68.60)	204 (58.96)	68 (68.69)	64 (59.81)
Unmarried	4	0	1	0
DSW*	8 (57.14)	24 (75.00)	8 (100.00)	11 (57.89)
<u>All age groups</u>				
Married	344	346	99	107
Unmarried	526	558	181	181
DSW*	14	32	8	19
*DSW = Divorced, separated, and widowed				
<i>Figures within parentheses indicate percentages</i>				

Marital Status

Table 3 shows the marital status of males and females at lower and high altitudes of the Monpa population. At lower altitude, about 3% of the married males and 12% of the married females belonged to the age group below 25 years. These frequencies are about 2% and 6% among the Monpas of high altitude. As generally expected, females get married earlier than males, and the marriage is little delayed at high altitude. This may be associated with different factors like education and economic condition. Further,

it shows that the incidence of divorced, separated, and widowed (DSW) cases is high in the age group 35 years and above. Among Monpas of high altitude, all cases of DSW in males and about 58% in females took place in the age group ≥ 35 years. Similarly, the incidence of DSW at lower altitude is also very high in the age group ≥ 35 years (57% in males and 75% in females). It is evident from the present findings that the cases of DSW are high in Monpas of both the altitudes when the persons are aged 35 years and above.

Socio-Economic Conditions

Table 4: Monpa Population by Income Groups

Income Group	Lower Altitude		High Altitude	
	N	Frequency (%)	N	Frequency (%)
Low	187	62.96	50	41.32
Middle	62	20.88	22	18.18
High	48	16.16	49	40.50
Total	297	100	121	100

Table 5: Monpa Population by Educational Levels

Educational Level	Lower Altitude		High Altitude	
	N	Frequency (%)	N	Frequency (%)
Illiterate	164	55.22	69	57.02
Primary	45	15.15	18	14.88
Secondary	45	15.15	12	9.92
Above Second	43	14.48	22	18.18
Total	297	100	121	100

Table 4 shows the number and percentages Monpa population at lower and high altitudes by income groups based on household per capita monthly income. It was found majority of the respondents at lower (62.96) and high (41.32) altitude belong to Low Income Group (LIG). At lower altitude, 20.88 % of the respondents belong to the Middle-Income Group (LIG). At high altitude on the other hand, 40.50% of the respondents belong to the High-Income Group (LIG). As for education level, Table 5 shows that majority of the respondents at lower (55.22) and high (57.02) altitude are illiterate. At lower altitude, 15.15 % of the respondents belong to the primary and secondary level of education. On the other hand, 18.18 % of the respondents at high altitude are in the above secondary level of education.

Summary and Conclusion

The present study indicates that, according to Sunbarg's classification of population, the Monpa population at high altitude may be categorized as regressive type, whereas, the Monpa population at lower altitude appears to be stationary type. The overall sex ratio among Monpas seems to be tilted towards females at lower altitude and little higher at high altitude, but did not deviate significantly from the ideal sex ratio of 1:1. Overall, the present studies suggest that there is not much variation between Monpas of lower and high altitudes in respect of demographic parameters. The findings may be attributed to the relationship of population structure of the Monpas with education, income, or even to geographical distribution of the Monpa's population in Arunachal Pradesh. However, due to small sample size in the present study - especially of high altitude - it is important to note that there is a scope for future study with respect to demography of the Monpas at low and high altitude.

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