

CHAPTER 2

POPULATION SIZE, GROWTH AND DISTRIBUTION

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2.1 Introduction

Nepal has a long history of census taking dating back to the early 19th century. Periodic censuses have been undertaken since 1911 at roughly ten years interval up to 1961 and thereafter at every ten years interval. The census conducted up to 1941 did not explain details of the census methodology. The information collected in these earlier censuses are very limited and information obtained seem only head counts although it is seen that the questionnaire included other socio-economic and demographic characteristics also. In 1952/54, the census was conducted using internationally acceptable definition and concepts. Because of various reasons, the census was carried out at two phases i.e. eastern part of the country (except Mahhotari) was enumerated in 1952 and rest of the country was enumerated in 1954. In the modern sense of the term the census started with 1952/54 census. However due to the time reference problem in the census of 1952/54, the 1961 census is generally accepted as the first scientific census in terms of international standard and comparisons. Then the subsequent censuses were all conducted at one point of time and are of international standard.

In the absence of complete vital registration and the other representative regular population surveys the main source of population statistics in Nepal is the decennial population censuses. The size of the population is usually the first demographic fact that a government tries to obtain. However, for many purposes information's on size and characteristics of the total population is not sufficient. Population data are often needed for geographic sub divisions of a country and for other classifications of areas in which people live. The census results are used for diverse purposes such as updating population estimates, developing and updating sampling frames, correcting and updating population registers, delimitations of electoral districts etc. For adequate planning on the national and regional levels, a nation requires detailed information about the characteristics of the society and specific goals of government programs to improve living conditions. This chapter deals with the size, growth, age sex composition and spatial distribution of the population.

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2.2 Population Size and Growth Rate

The total population at various censuses since 1911, corresponding annual growth rates and time to double the population is presented in Table 2.1.

Table 2.1 : Population size, growth rate and doubling time, Nepal, 1911 – 2001

Census year	Total Population	Population Change	Annual Growth Rate (Exponential)	Doubling Time
1911	5,638,749		-	-
1920	5,573,788	- 64,961	-0.13	-
1930	5,532,574	41,214	-0.07	-
1941	6,283,649	7,51,075	1.16	60
1952-54	8,256,625	19,72,976	2.27	31
1961	9,412,996	11,56,371	1.64	42
1971	11,555,983	21,42,987	2.05	34
1981	15,022,839	34,66,856	2.62	26
1991	18,491,097	34,68,258	2.08	33
2001	23,151,423	46,60,326	2.25	31

Source : CBS, 1958, Table 2

CBS, 1968 Vol. III, Part II Table 2

CBS, 1975 Vol. I, Table 2

CBS, 1984 Vol. I, Table 4

CBS, 1993 Vol. I, Table 5

CBS, 2002 National Report Vol. I, Table 1

Table 2.1 shows that the population of Nepal declined up to 1930 and then after population started to grow. However, the population of the country did not grow at a uniform rate. At the time of the latest census of 2001, Nepal's population reached 23.1 million with annual average growth rate of 2.25 percent during the last decade 1991-2001. In less than a century, the population of the country has more than quadrupled itself. In 1911 Nepal's total population yielded 5.6 million. The main reasons of population decline in the period 1911 to 1930 are not known but may be attributed to the effect of worldwide influenza epidemic and the heavy casualties suffered by Nepalese army in the First World War (CBS, 1987, CBS, 1995). In the other hand it is argued that there may also have been problems of undercounting of these censuses. The censuses of 1920, 1930 and 1941 were conducted in abnormal periods i.e. the census of 1920 was conducted immediately after the first world war and the 1941 census was taken during the mid period of second world war in which about 1,80,000 to 2,00,000 Nepalese soldiers participated respectively in Allied side (Singh, 1983). Also the census of 1930 was taken at the time when Nepal was

preparing for war with Tibet (now China). Though the population, which suffered heavy casualties in war, were mostly males, the sex ratio was found to be high (Singh, 1983) i.e. there were more males than females. Particularly, in pre-modern times, the emphasis in census taking was upon fiscal and military potentials. Hence, women, children, aliens, slaves or aborigines were usually relatively undercounted or omitted altogether. It is therefore natural to expect that up to 1941, censuses of Nepal were not complete.

The rate of increase in the period 1941 to 1952/54 was improbably high in comparison with the earlier period. Prior to the 1952/54 censuses, the overall coverage of the censuses was poor so this may have led the population growth rate to be high in 1952/54. In the other hand, in 1951, Nepal became a democratic country and after this change attempted the improvement in the management of census taking. Census contents were designed in accordance to international convention, people felt real purpose and usefulness of census and census officers were sent abroad for training. This could have led to an overall improvement in the census coverage. The other explanation is that the census was taken at two points of time and this could lead to the over counting of some people due to the long time gap between the two enumerations.

Although population of Nepal grew at 1.64 percent per annum, the population growth rate was found lower during 1952/54 to 1961 than that of 1941 to 1952/54. However, since 1971 census to 2001 census population growth rates have crossed 2 percent per annum even though growth rates do not follow unidirectional trend. The population growth rate observed during the period 1971 to 1981 is found very high compared to 1981 to 1991 period. This may be attributed to the rapid fall in mortality without any corresponding fall in fertility. Again, analysis of population growth rate during the period 1981 to 1991 shows some decline while population growth rate during 1991 to 2001 is again high than during the period 1981 to 1991. The annual growth rates of population mostly relate to the quality of data obtained in the census notably the coverage and undercount and possibly over-count in different censuses. In 1981 over-enumeration was possible because of the highest monetary incentive given to field workers compared to all other censuses (Karki, 1992). A fluctuation in the annual growth rate is also reflected in the doubling time of Nepal's populations (Table 2.1).

The Post Enumeration Survey (PES), designed to evaluate the 1991 and 2001 census data quality with respect to completeness of coverage, was delayed by 4 months while in 1991 it was delayed by 6 months. Although in 1991 census about 11 percent undercount was estimated, the results of the PES was not accepted for a number of reasons including the timing of the conduct of PES (for more see Population Monograph, Nepal, 1995, p.3). However the net omission is estimated to be 5.3% for 2001 census.

2.3 Spatial Distribution of Population

Spatial distribution of Population represents the relationship of human habitat to the physical boundaries. In the past, human were being interested to settle in the areas conducive to agriculture and thus began to be attracted towards developed areas or in the favorable physical environment. The spatial distribution of human population is a fundamental determinant of both the societal impacts and anthropogenic drives of global change (Pozzi et al, 2002). Moreover, the spatial distribution of a country may be affected by socio cultural, economic, environmental, historical and developmental factors. The population growth and the spatial distribution will lead to the extension of urbanization which impacts on natural resources and the environment (Pozzi et al, 2002). Thus, the environment implications associated with population growth are not only related to the total number of people, but also to their spatial distribution. The concern with population distribution was also highlighted in the 1994 ICPD program of action, where the emphasis is placed on the issues of population distribution and sustainable development.

Nepal's political geography has undergone a great change since the ancient time. In the rana regime, Nepal was divided into 20 Hill Districts, 9 Terai Districts and 3 inner Terai (Bhitri Madesh) Districts (Pandey, 2042). However, the geographical administrative division of Nepal, which was based on Rana Regime, was cancelled in 1961 and then the country was divided into 75 Districts and 14 zones. Each District is further divided into Village Development Committees and Municipalities. At present there are 3915 Village Development Committees and 58 Municipalities in the country. Again the 14 Zones were grouped in into four development regions in 1972. Later it was increased to five development regions in 1980. Five development regions are Eastern, Central, Western, Mid Western and Far Western. After the resolution of multiparty system the zones are not seen to be functional administrative units. Thus, in this chapter the spatial distribution of population is focused on Ecological Zone, Eco-development Regions, Districts and Village Development Committee/Municipality.

2.3.1 Population Distribution by Ecological Zone

Geographically the country is divided into three regions called Ecological Zones. They are Mountain, Hill and Terai. Ecological Zones reflect the climatic condition and the variation of agricultural land and others resources. The population distribution of Nepal by Ecological Zones for the census year 1952/54 to 2001 is shown in Table 2.2. The table reveals that the population

of the Terai has been increasing rapidly year by year. The Terai had enumerated 35 percent of the total population in the census year 1952/54 and has increased to 48 percent in the census year 2001. There has been a marked decrease in the share of population in Mountain and Hill from 65 percent in 1952/54 to 52 percent in 2001. Interestingly, the declining trend is observed in both the Mountain and the Hill.

Initially, Terai region was covered with dense forest and highly infested with malaria and other transmissible diseases. Later the diseases were controlled and the deforestation increased day by day for the human settlement and the pattern of population distribution by Ecological Zone is changing (CBS, 1995). According to latest census 2001, Terai region alone shared about fifty percent of the total population, Hill and Mountains shared about 44 and 7 percentage of total population respectively.

Table 2.2 : Distribution of population by ecological zone, Nepal, 1952/54-2001.

Census Year	Mountain	Hill	Mountain & Hill	Terai	Total
1952/54	- -	- -	5349988 (64.8)	2906637 (35.2)	8256625
1961	- -	- -	5991297 (63.6)	3421699 (36.4)	9412996
1971	1138610 (9.9)	6071407 (52.5)	7210017 (62.4)	4345966 (37.6)	11555983
1981	1302896 (8.7)	7163115 (47.7)	8466011 (56.4)	6556828 (43.6)	15022839
1991	1443130 (7.8)	8419889 (45.5)	9863019 (53.3)	8628078 (46.7)	18491097
2001	1687859 (7.3)	10251111 (44.3)	11938970 (51.6)	11212453 (48.4)	23151423

Sources : CBS, 1958, Vol. I

CBS, 1966, Vol. I

CBS, 1975, Vol. I

CBS, 1984, Vol. Part I

CBS, 1993, Vol. Part I

CBS, 2002, National Report

Note : Figures in the parenthesis indicates percentage of the total population.

2.3.2 Population Distribution by Development Regions

The distribution of the Population by development regions in Nepal is shown in Table 2.3. The Central and Far Western Development Region has observed slightly increasing trend in the distribution of population. The Central and Far Western Development regions have accounted about 33 and 9 percent of total population in 1981 and these respective figures increased to 35 and 10 percent in 2001. However, slightly decreasing trend is seen in Eastern and Western Development Regions. About 25 and 21 percentage of the total population have been counted in Eastern and Western Development Regions in 1981, whereas the respective percentage decreased to 23 and 20 percentage in 2001. The Mid Western Development Region has been steadily increasing the size of population. According to latest census of 2001 it is found that more than one third of Nepal's population live in the Central Development Regions and less than 10 percent in the Far Western Development Region. Similarly Eastern and Western region shared 23 and 20 percent of total population. On the other hand Mid Western Region's share is only 13 percent of total population.

Table 2.3 : Population distribution by development regions, Nepal, 1981-2001.

Development Region	Population			Percentage		
	1981	1991	2001	1981	1991	2001
Eastern	3708923	4446749	5344476	24.69	24.05	23.09
Central	4909357	6183955	8031629	32.68	33.44	34.69
Western	3128859	3770678	4571013	20.83	20.39	19.74
Mid Western	1955611	2410414	3012975	13.02	13.04	13.01
Far western	1320089	1679301	2191330	8.78	9.08	9.47
Total	15022839	18491097	23151423	100	100	100

Source : CBS, 1984, Vol I Part I

CBS, 1993, Vol I part I

CBS, 2002, National Report

2.3.3 Population Distribution by Ecological Zones & Development Regions

The percentage distributions of population by Ecological Zones and Development Regions for 1981 to 2001 are shown in Table 2.4. The table reveals that percentage share of population in Mountain region is decreasing however the share of total population varied in different sub-regions. In Mountain, the percentage varied from a maximum of 2.4 percent in Central Mountain to a minimum of 0.1 percent in Western Mountain for the census year 2001.

The Hill represents the very interesting pattern of Population distribution. The share of total population is decreasing from 48 percent in 1981 to 44 in 2001, however the Central Hill has showed slightly increasing trend in the share of population distribution from 14 percent in 1981 to 15 percent in 2001. This may be partly due to the inclusion of Kathmandu District in this sub-region, which is the capital city of kingdom and experiencing continuous growth of its population from one census to another.

On the other hand, compared with the previous census all the sub-regions in the Terai increased their share of total population and also considerable variation is observed among the sub regions. In the Eastern Terai, small fluctuation is observed in the share of total population. Central Terai experienced slight increase in the share of Total population from 15.9 percent in 1981 to 17 percent in 2001 and followed by Western and Midwestern Terai. Compared with other sub-regions of Terai, the variation in the share of total population is high in the Far Western Terai from 2.8 percent in 1981 to 4.3 percent in 2001.

Table 2.4 : Percentage distribution of total population in different ecological & development regions of Nepal, 1981-2001.

Ecological Zones and Development Regions	Percentage Distribution of Population		
	1981	1991	2001
Mountain	8.7	7.8	7.3
Eastern	2.3	1.9	1.7
Central	2.8	2.5	2.4
Western	0.1	0.1	0.1
Mid western	1.6	1.4	1.3
Far western	1.9	1.8	1.7
Hill	47.7	45.5	44.3
Eastern	8.4	7.7	7.1
Central	14.0	14.5	15.3
Western	14.3	13.1	12.1
Mid western	6.9	6.6	6.4
Far western	4.0	3.6	3.5
Terai	43.6	46.7	48.4
Eastern	14.1	14.4	14.2
Central	15.9	16.4	17.0
Western	6.4	7.2	7.6
Mid western	4.4	5.0	5.3
Far western	2.8	3.7	4.3

Source : CBS, 1995 p. 29

CBS, 1993 Vol. Part I

CBS, 2002, National Report

2.3.4 Population Distribution by District

Although the Village Development Committees/Municipalities is the lowest administrative unit in the country, the District is functioning as a coordinating administrative unit to formulate, execute and evaluate the plans and also for administrative work. Therefore it is appropriate to examine the population distribution by District and also the distribution of District according to population size.

The number of Districts remained constant at 75 since 1971 census; however there had been great changes in area of the District between 1971 and 1981 and also for some Districts the boundary changes took place in 1982. Thus the population distributions by Districts were not strictly comparable till 1991. The share of population distribution by Districts and region are shown in Table 2.5 for the census year 1991 and 2001. The average annual growth rates for the inter censal period 1991 to 2001 are shown for the same period.

In 1991, the five Districts having the share of highest population size were Kathmandu (675341), Morang (674823), Jhapa (593737), Dhanusa (543672) and Sarlahi (492798). In 2001 also, all of the above Districts retained their positions as districts with large size population. Among the five, Kathmandu belongs to Central Hill, Jhapa and Morang belongs to Eastern Terai, Dhanusa and Sarlahi belongs to Central Terai (see Table 2.5).

On the other hand, Manang (5363), Mustang (14292), Dolpa (25013), Humla (34383) and Mugu (36364) were the five least populated Districts in 1991. In 2001 also, all of those Districts were the least populated Districts in the same rank as in 1991, though Manang almost doubled its population in 2001. The Table 2.5 also reveals that though, there is reduction in the share of total population for some Districts, slight growth in the population is observed in all Districts.

Table 2.5 : Distribution of population by district and population growth rates, 1991-2001.

Area	Population 1991		Population 2001		Average Annual Growth Rates (%)
	Number	Percent	Number	Percent	
Nepal	18491097	100	23151423	100	2.25
<i>Eastern Dev. Reg.</i>	<i>4446749</i>	<i>24.05</i>	<i>5344476</i>	<i>23.09</i>	<i>1.84</i>
<i>Eastern mountain</i>	<i>359156</i>	<i>1.94</i>	<i>401587</i>	<i>1.73</i>	<i>1.12</i>
Taplejung	120053	0.65	134698	0.58	1.15
Sankhuwasabha	141903	0.77	159203	0.69	1.15
Solukhumbu	97200	0.53	107686	0.47	1.02

Area	Population 1991		Population 2001		Average Annual Growth Rates (%)
	Number	Percent	Number	Percent	
Eastern Hill	1429138	7.73	1643246	7.10	1.40
Panchthar	175206	0.95	202056	0.87	1.43
Ilam	229214	1.24	282806	1.22	2.10
Dhankuta	146386	0.79	166479	0.72	1.29
Terhathum	102870	0.56	113111	0.49	0.95
Bhojpur	198784	1.08	203018	0.88	0.21
Okhaldhunga	139457	0.75	156702	0.68	1.17
Khotang	215965	1.17	231385	1.00	0.69
Udayapur	221256	1.20	287689	1.24	2.63
Eastern Terai	2658455	14.38	3299643	14.25	2.16
Jhapa *	593737	3.21	688109	2.97	1.48
Morang	674823	3.65	843220	3.64	2.23
Sunsari	463481	2.51	625633	2.70	3.00
Saptari	465668	2.52	570282	2.46	2.03
Siraha	460746	2.49	572399	2.47	2.17
Central Dev.Reg.	6183955	33.44	8031629	34.69	2.61
Central Mountain	471005	2.55	554817	2.40	1.64
Dolakha	173236	0.94	204229	0.88	1.65
Sindhupalchok*	261025	1.41	305857	1.32	1.59
Rasuwa	36744	0.20	44731	0.19	1.97
Central Hill	2679599	14.49	3542732	15.30	2.79
Kavrepalanchok	324329	1.75	385672	1.67	1.73
Lalitpur	257086	1.39	337785	1.46	2.73
Bhaktapur	172952	0.94	225461	0.97	2.65
Kathmandu	675341	3.65	1081845	4.67	4.71
Nuwakot	245260	1.33	288478	1.25	1.62
Sindhuli*	223900	1.21	279821	1.21	2.23
Ramechhap	188064	1.02	212408	0.92	1.22
Dhading	278068	1.50	338658	1.46	1.97
Makwanpur	314599	1.70	392604	1.70	2.22
Central Terai	3033351	16.40	3934080	16.99	2.60
Dhanusa	543672	2.94	671364	2.90	2.11
Mahottari	440146	2.38	553481	2.39	2.29
Sarlahi	492798	2.67	635701	2.75	2.55
Rautahat	414005	2.24	545132	2.35	2.75
Bara	415718	2.25	559135	2.42	2.96
Parsa	372524	2.01	497219	2.15	2.89
Chitawan	354488	1.92	472048	2.04	2.86
Western Dev.Reg.	3770678	20.39	4571013	19.74	1.92
Western Mountain	19655	0.11	24568	0.11	2.23
Manang	5363	0.03	9587	0.04	5.81
Mustang	14292	0.08	14981	0.06	0.47
Western Hill	2420878	13.09	2793180	12.06	1.43
Gorkha	252524	1.37	288134	1.24	1.32
Lamjung	153697	0.83	177149	0.77	1.42
Tanahu	268073	1.45	315237	1.36	1.62
Syangja	293526	1.59	317320	1.37	0.78
Kaski	292945	1.58	380527	1.64	2.62

Area	Population 1991		Population 2001		Average Annual Growth Rates (%)
	Number	Percent	Number	Percent	
Myagdi	100552	0.54	114447	0.49	1.29
Parbat	143547	0.78	157826	0.68	0.95
Baglung	232486	1.26	268937	1.16	1.46
Gulmi	266331	1.44	296654	1.28	1.08
Palpa	236313	1.28	268558	1.16	1.28
Arghakhanchi	180884	0.98	208391	0.90	1.42
Western Terai	1330145	7.19	1753265	7.57	2.76
Nawalparasi	436217	2.36	562870	2.43	2.55
Rupandehi	522150	2.82	708419	3.06	3.05
Kapilbastu	371778	2.01	481976	2.08	2.60
Mid-West.Dev.Reg.	2410414	13.04	3012975	13.01	2.26
Mid-Western Mountain	260529	1.41	309084	1.34	1.71
Dolpa*	25013	0.14	29545	0.13	1.67
Jumla*	75964	0.41	89427	0.39	1.63
Kalikot*	88805	0.48	105580	0.46	1.73
Mugu*	36364	0.20	43937	0.19	1.89
Humla	34383	0.19	40595	0.18	1.66
Mid-Western Hill	1219555	6.60	1473022	6.36	1.89
Pyuthan	175469	0.95	212484	0.92	1.91
Rolpa	179621	0.97	210004	0.91	1.56
Rukum	155554	0.84	188438	0.81	1.92
Salyan *	181785	0.98	213500	0.92	1.61
Surkhet *	225768	1.22	288527	1.25	2.45
Dailekh	187400	1.01	225201	0.97	1.84
Jajarkot	113958	0.62	134868	0.58	1.68
Mid-Western Terai	930330	5.03	1230869	5.32	2.80
Dang	354413	1.92	462380	2.00	2.66
Banke	285604	1.54	385840	1.67	3.01
Bardiya	290313	1.57	382649	1.65	2.76
Far-West. Dev.Reg.	1679301	9.08	2191330	9.47	2.26
Far-Western Mountain	332785	1.80	397803	1.72	1.78
Bajura	92010	0.50	108781	0.47	1.67
Bajhang	139092	0.75	167026	0.72	1.83
Darchula	101683	0.55	121996	0.53	1.82
Far-Western Hill	670719	3.63	798931	3.45	1.75
Achham	198188	1.07	231285	1.00	1.54
Doti	167168	0.90	207066	0.89	2.14
Dadeldhura	104647	0.57	126162	0.54	1.87
Baitadi	200716	1.09	234418	1.01	1.55
Far-Western Terai	675797	3.65	994596	4.30	3.86
Kailali	417891	2.26	616697	2.66	3.89
Kanchanpur	257906	1.39	377899	1.63	3.82

Source : CBS, 1993, Vol. Part I

CBS, 2002, National report

Note : * Indicates the affected Districts in 2001 Population Census.

The distribution of Districts according to unadjusted population size (due to change in the District boundaries) is shown in Table 2.6 for the Census years 1971-2001. This table shows that there was no District at the population size group 500,000 or more in 1971, but the number of District reached one in 1981, five in 1991 and 14 in 2001. Though there is a decrease in the number of Districts in the population size group 4,00,000-4,99,999 from nine in 1991 to 4 in 2001, the increase in the number of Districts is observed in the population size group 3,00,000-3,99,999 and 2,00,000-2,99,999 from 1971 census to 2001. This reveals that the Districts are shifting towards higher population size group.

Interestingly, Table 2.6 also demonstrates that the modal population size of the District (the size with the maximum number of District) is same i.e. 1,00,000-1,99,999. At the lower side, having the population size less than 10,000, there is only one District from 19971 to 2001. On the other hand there were three Districts in the second lowest population size group i.e. 20,000-29,000 in 1971 whereas they decreased to only one District in 2001.

2.3.5 Distribution of Village Development Committees/Municipalities by Size of Population

The distribution of VDC/Municipalities (settlements) according to size of population is shown in Table 2.7. The classification starts from “less than 500 persons” and end up with “1,00,000 or more”. There has been a continuous change in the number of VDC/Municipalities due to either breaking up or combining to form new VDCs. However the table shows the direction of population distribution by VDC/Municipalities by size of population. In 1971, high share of population was in the 2,000-2,999 Population size group (33.98 %) but it increased to 5,000-5,999 population size groups in 2001 (31.44 %). The table also shows the increase in the share of population in the high size group and decrease in the proportion of the population residing in small settlements. There is marked decrease in the population size group of less than 4, 000 people, which are the settlement of “C” categories according to Local Governance Act 2056. Mostly high group of settlement includes municipalities and less populated settlements are Village Development Committees located in the mountains.

Table 2.6 : Distribution of district by size of population, Nepal, 1970-2001.

Size of Population	Number of District				Population				Percentage				Cumulative Percentage			
	1971	1981	1991	2001	1971	1981	1991	2001	1971	1981	1991	2001	1971	1981	1991	2001
5,00,000 or more	--	1	5	14	--	534692	3009723	9234287	--	3.56	16.28	18.20	100	100	100	100
400,000-499999	--	3	9	4	--	1,334,549	4006670	1913623	--	8.88	21.67	7.10	100	96.44	83.72	81.80
300000-399999	7	10	6	11	2,245,707	3,505,384	2092131	3920048	19.43	23.33	11.31	18.40	100	87.56	62.06	74.70
200000-299999	12	18	20	23	2,752,028	4,293,871	5034279	5570510	23.82	28.58	27.23	33.95	80.57	64.22	50.74	56.30
100000-199999	41	28	25	16	5,802,698	4,433,030	3842156	2240152	50.22	29.51	20.78	14.09	56.75	35.64	23.52	22.35
90000-99999	2	4	2	--	190,986	378,888	189210	--	1.65	2.52	1.02	--	6.53	6.13	2.74	8.26
80000-89999	2	3	--	1	171,279	262,736	88805	89427	1.48	1.75	0.48	0.53	4.88	3.61	1.71	8.26
70000-79999	--	1	1	--	--	74,649	75964	--	--	0.50	0.41	--	3.39	1.86	1.23	7.73
60000-69999	3	1	1	--	199,073	68,797	-	--	1.72	0.46	--	--	3.39	1.36	0.82	7.73
50000-59999	1	--	--	--	57,946	--	-	--	0.50	--	--	--	1.67	0.91	0.82	7.73
40000-49999	--	1	--	3	--	43,705	-	129263	--	0.29	--	2.43	1.17	0.91	0.82	7.73
30000-39999	--	1	3	--	--	30,241	107491	--	--	0.20	0.58	--	1.17	0.62	0.82	5.30
20000-29999	3	2	1	1	82,186	42,346	25013	29545	0.71	0.28	0.14	1.01	1.17	0.41	0.24	5.30
10000-19999	3	1	1	1	45,644	12,930	14292	14981	0.40	0.09	0.08	2.66	0.46	0.13	0.11	4.29
Below 10000	1	1	1	1	7,436	7,021	5363	9587	0.06	0.05	0.03	1.63	0.06	0.05	0.03	1.63
Total	75	75	75	75	11554983	15022839	18491097	23151423	100	100	100	100				

Source : CBS, 1987 p. 25; CBS, 1995 p. 36-37, CBS, 2002, National Report.

Table 2.7: Distribution of VDC and municipalities by size of Population, Nepal, 1970-2001.

Size of Population	Number of Localities				Population				Percentage				Cumulative Percentage			
	1971	1981	1991	2001*	1971	1981	1991	2001	1971	1981	1991	2001	1971	1981	1991	2001
1,00,000 and more	1	1	3	5	150402	235160	666511	1270307	1.30	1.57	3.60	5.59	100	100	100	100
50,000-99,999	1	2	8	11	59049	173419	517419	788937	0.51	1.15	2.80	3.47	98.70	98.43	96.40	94.41
20,000-49,999	5	22	16	55	149849	666439	479590	1532143	1.30	4.44	2.59	6.74	98.19	97.28	93.60	90.94
10,000-19,999	17	101	165	285	223136	1250428	2115401	3868363	1.93	8.32	11.44	17.01	96.89	92.84	91.01	84.20
5,000-9,999	229	1016	761	1067	1387840	6604790	5070998	7147792	12.01	43.96	27.42	31.44	94.96	84.52	79.57	67.19
4,000-4,999	327	569	661	701	1442740	2540533	2943691	3130844	12.48	16.91	15.92	13.77	82.95	40.56	52.15	35.75
3,000-3,999	790	634	1033	802	2701908	2231148	3594054	2822915	23.38	14.85	19.43	12.42	70.47	23.64	36.24	21.98
2,000-2,999	1584	432	964	662	3926758	1119768	2455590	1676754	33.98	7.45	13.28	7.37	47.08	8.79	16.81	9.57
1,000-1,999	974	105	365	231	1437103	162808	602845	371769	12.44	1.08	3.26	1.64	13.10	1.34	3.53	2.19
500-999	91	44	56	59	72263	34773	44318	123133	0.63	0.23	0.24	0.54	0.67	0.26	0.27	0.56
Less than 500	12	9	16	11	4935	3573	5680	3977	0.04	0.02	0.03	0.02	0.04	0.02	0.03	0.02
Total	4031	2935	4048	3889	11555983	15022839	18496097	22736934	100	100	100	100				

Source : CBS, 1987 p. 26; CBS, 1995 p. 38-39, CBS, 2002 National Report.

Note : * Affected 58 VDCs are excluded from the total.

2.4 Population Growth Variation

2.4.1 Population Growth by Ecological Zone

The intercensal population growth rates by Ecological Zones from the census year 1961-2001 are presented in Table 2.8. From the table it can be noted that the population of Terai is growing up at a rapid rate of growth. The table also reveals that the population growth rate for the Mountain and Hill was decreasing until 1991 and increased for the period 1991-2001, however the increment rate is low. On the other hand, the growth for the Terai highly increased from 2.39 per annum in 1961-71 to 4.11 per annum in 1971-1981 periods, whereas marked decrease is observed for the period 1981-91 (2.75 per annum) and also decreased to 2.62 per annum for the period 1991-2001. This indicates that the flow of people from Mountains and Hill to Terai has slowed down in later period compared to the earlier period. Mainly two pull factors; agricultural land and employment opportunities are the reasons behind the high rate of flow of people from Mountain and Hill to Terai.

Table 2.8: Population growth rates by ecological zones, Nepal, 1961-2001.

Period	Average Annual Growth Rate of Population 1961-2001				
	Mountain	Hill	Mountain + Hill	Terai	Total
1961-1971	-	-	1.85	2.39	2.05
1971-1981	1.35	1.65	1.61	4.11	2.62
1981-1991	1.02	1.61	1.52	2.75	2.08
1991-2001	1.57	1.97	1.91	2.62	2.25

Source : CBS, 1995 p 27

CBS, 2002, National Report

Note : Growth rates are exponential rate of growth

2.4.2 Population Growth by Ecological Zone and Development Regions

The population growth rate by Ecological and Development Regions for the period 1991-2001 is shown in Table 2.9. The population growth rate per annum seems least in Eastern Development Region (1.84) and highest in Central Development Region (2.61). The population growth rate is also observed less than two per annum in Western Development Region.

The Table 2.9 shows that all the Eco-development regions in the Mountains has the population growth rates less than two percent except in Western Mountain. Western mountain has reported 2.23 percent per annum growth rate for the period 1991-2001 whereas it was negative (-0.15) for the period 1981-91. The population growth rate may have been affected by Manang District, which has enumerated nearly double the population in 2001 than that in 1991 Census.

For Hill, also all the Eco-development Regions has less than two percent population growth rates except the Central Hill, which includes Kathmandu District and has second highest population growth rates among the Districts.

On the other hand, all the Eco-development Regions in Terai have reported more than two percent population growth rates and the highest is in the Far western Terai (3.86%).

Table 2.9 : Population growth rates by ecological & development regions, Nepal, 1991-2001.

Development Regions	Average Annual Growth Rate of Population			
	Mountain	Hill	Terai	Total
Eastern	1.12	1.40	2.16	1.84
Central	1.64	2.79	2.60	2.61
Western	2.23	1.43	2.76	1.92
Mid-western	1.71	1.89	2.80	2.26
Far western	1.78	1.75	3.86	2.26

Source : Same as in Table 2.5

2.4.3 Population Growth by District

Population growth rates by District are shown in Table 2.5 for the period 1991-2001. From the table it can be noted that human settlements are spread throughout the District, however wide variation is observed in the population growth rates among the Districts. The population growth rate is highest in Manang (5.81 % per annum) and followed by Kathmandu (4.71% per annum), whereas Manang was the lowest in the rank of population growth for the period 1981-1991. Also, the population growth rate is observed least in Bhojpur (0.21% per annum) and is followed by Mustang (0.47%).

Table 2.10: Ranking of district population growth rates by ecological zones

<i>Growth rate % per annum</i>	<i>Mountains</i>	<i>Hill</i>	<i>Terai</i>
Less than 1.00	1	5	--
1.00 - 1.99	14	24	1
2.00 - 2.99	--	8	14
3.00 - 3.99	--	--	5
4.00 - 4.99	--	1	--
5.00 and above	1	--	--
Total Districts	16	39	20

Source : Same as in Table 2.5

Table 2.10 reveals that population growth rates of the mountainous Districts varied between 1 to 1.99 percent per annum except in Mustang and Manang. Mustang has less than one percent (0.47%) growth rate whereas Manang has more than 5 percent per annum (5.81) population growth rate. This indicates wide variation of the population growth for the Mountainous District.

Similarly in the Hill, most of the District's population growth rates is varied between 1 to 1.99 percent per annum, however the population growth is less than one percent and more than two percent per annum in some Districts. In Hill, one District has reported population growth rate in the range of 4 to 4.99 percent per annum i.e. Kathmandu (4.71%).

In Terai, no District has the population growth rates less than one percent and most of the District's population rate varies between 2 to 2.99 percent per annum (see Table 2.10), however one district has accounted population growth rate of less than two percent i.e. Jhapa (1.48%) and five Districts have reported population growth rate in the range of 3 to 3.99 percent per annum.

Table 2.11: Ranking of district wise population growth rates by development regions

<i>Growth Rate % per Annum</i>	<i>EDR</i>	<i>CDR</i>	<i>WDR</i>	<i>MWDR</i>	<i>FWDR</i>
Less than 1.00	3	--	3	--	--
1.00 - 1.99	7	7	8	11	6
2.00 - 2.99	5	11	3	3	1
3.00 - 3.99	1	--	1	1	2
4.00 - 4.99	--	1	--	--	--
5.00 and above	--	--	1	--	--
Total Districts	16	19	16	15	9

Source : Same as in Table 2.5

From the table it can be noted that more than the fifty percent of the Districts have population growth rates in the range of 1 to 1.99 percent and about one third of Districts have population growth rates in the range of 2-2.99 percent per annum. Very few Districts have observed less than one and more than three percentage population growth rates (see Table 2.11). More Districts in the Central Development Regions have population growth rates in the range of 2 to 2.99 percent per annum.

2.5 Population Density

Population density is an effective index to measure the pressure of population on Land. The population per square kilometer of total area measures the population density. The population density by Ecological Zones, Development Regions and Districts are presented here.

2.5.1 Population Density by Ecological Zones

The pressure of population is increasing in all increased the Ecological Zones, the high increasing pattern is observed in Terai as density in Terai by 71 percent during the last 20 years from 1981 to 2001. As discussed earlier it is mainly due to the flow of people from Mountain and Hill to Terai. The population pressure is reported very high in Terai and is followed by Hill and Mountain (see Table 2.12).

2.5.2 Population Density by Development Regions

From the Table 2.12 it may be noted that the population density is highest in Central Development Region and lowest in the Far Western Development Region. However, compared to 1981 2001, the increasing rate of population pressure is high in Far Western Development Regions (66 %) followed by Central Development Region (63.6%). Moreover, the lowest increasing rate is observed in Eastern Development Region (44%) followed by Western Development Region (46%). However, the national increment rate is 54 percent (102.01 in 1981 to 157.30 in 2001) during the same 20 years period.

Table 2.12: Population density by ecological zones & development regions, Nepal, 1981-2001.

Zones/Regions		Eastern	Central	Western	Mid Western	Far Western	Total
Mountain	Area sq.km.	10438	6277	5819	21351	7932	51817
Density Person	1981	32.41	65.82	3.43	11.35	36.42	25.14
per sq.km.	1991	34.40	75.03	3.37	12.20	41.95	27.85
	2001	38.47	88.39	4.22	14.48	50.15	32.57
Hill	Area sq.km.	10749	11805	18319	13710	6762	61345
Density Person	1981	116.94	178.60	117.41	76.03	89.37	116.76
per sq.km.	1991	132.95	226.98	132.15	88.95	99.18	137.25
	2001	152.87	300.10	152.47	107.44	118.15	167.11
Terai	Area sq.km.	7269	9328	5260	7317	4845	34024
Density Person	1981	290.70	255.97	182.11	91.67	88.23	192.71
per sq.km.	1991	365.72	325.18	252.87	127.14	139.62	253.58
	2001	453.93	421.75	333.32	168.22	205.28	329.59
Total	Area sq.km.	28456	27410	29398	42378	19539	147181
Density Person	1981	130.32	179.10	106.43	46.14	67.56	102.01
per sq.km.	1991	156.25	225.61	128.26	56.87	85.95	125.63
	2001	187.82	293.02	155.49	71.10	112.15	157.30

Source : CBS, 1995 p. 54

CBS, 2002, National Report

2.5.3 Population Density by Ecological Zones and Development Regions

The population Density of each Region in Terai is observed higher than that of the each Region of Hill and Mountain in 1991 and 2001. Interestingly, the population density of the Far-western Region in the Terai (88.23) was slightly lower than the density of Hill areas of the corresponding Region (89.37) in 1981 (see Table 2.12). This table also reveals that, in terms of population pressure Western Mountain was the least populated region of Nepal followed by Mid Western Mountain. On the other hand, highest population density is observed in Eastern Terai followed by Central Terai. Although, Western Mountain has seen slight decline in population density from 3.43 in 1981 to 3.37 in 1991, no region has reported decline in population density in 2001. During the last 20 years period, the increment rate in the population density is high in Far western Terai (123%) and least in Western Mountain (23%).

2.5.4 Population Density by Districts

Kathmandu was the most densely populated District followed by Bhaktapur and Lalitpur in 1991 and 2001, whereas Kathmandu was only in the second position in 1981. Dhanusa and Mahottari occupied the fourth and fifth positions in 1981 and they also retained their position in 1991 and 2001.

The Districts with least population pressure are Manang, Dolpa, Mustang and Humla. However, slight change in the rank is observed during the 20 years' period. Compared to 1981, Manang reported slightly decreased population density in 1991, however it increased again in 2001. Only one District, namely Mustang has reported almost same population density during the 20 years period (see Table 2.13).

Table 2.13 : Population densities by districts, Nepal, 1981-2001

District	Area in sq. Km.	Population Density (Person/Sq. Km.)		
		1981	1991	2001
<i>Eastern Mountain</i>	10,438	32	34	38
Taplejung	3,646	33	33	37
Sankhuwasabha	3,480	37	41	46
Solukhumbu	3,312	27	29	33
<i>Eastern Hill</i>	10,749	117	133	153
Panchthar	1,241	126	141	163
Ilam	1,703	105	135	166
Dhankuta	891	146	164	187
Terhathum	679	136	152	167
Bhojpur	1,507	128	132	135
Okhaldhunga	1,074	128	130	146
Khotang	1,591	134	136	145
Udayapur	2,063	77	107	139
<i>Eastern Tarai</i>	7,269	291	366	454
Jhapa*	1,606	299	370	428
Morang	1,855	288	364	455
Sunsari	1,257	274	369	498
Saptari	1,363	278	342	418
Siraha*	1,188	316	388	482
<i>Central Mountain</i>	6,277	66	75	88
Dolakha*	2,191	69	79	93

District	Area in sq. Km.	Population Density (Person/Sq. Km.)		
		1981	1991	2001
Sindhupalchok*	2,542	91	103	120
Rasuwa	1,544	20	24	29
<i>Central Hill</i>	11,805	179	227	300
Sindhuli*	2,491	74	90	112
Ramechhap	1,546	104	122	137
Kavrepalanchok	1,396	220	232	276
Lalitpur	385	479	670	877
Bhaktapur	119	1343	1453	1,895
Kathmandu	395	1069	1710	2,739
Nuwakot	1,121	181	219	257
Dhading	1,926	126	144	176
Makwanpur	2,426	100	130	162
<i>Central Tarai</i>	9,328	256	325	422
Dhanusa	1,180	367	461	569
Mahottari	1,002	360	439	552
Sarlahi	1,259	317	291	505
Rautahat	1,126	295	368	484
Bara	1,190	268	349	470
Parsa	1,353	210	275	367
Chitawan	2,218	117	160	213
<i>Western Mountain</i>	5,819	3	3	4
Manang	2,246	3	2	4
Mustang	3,573	4	4	4
<i>Western Hill</i>	18,319	117	132	152
Gorkha	3,610	64	70	80
Lamjung	1,692	90	91	105
Tanahu	1,546	145	173	204
Syangja	1,164	234	252	273
Kaski	2,017	110	145	189
Myagdi	2,297	42	44	50
Parbat	494	260	291	319
Baglung	1,784	121	130	151
Gulmi	1,149	207	232	258
Palpa	1,373	156	172	196
Arghakhanchi	1,193	132	152	175

District	Area in sq. Km.	Population Density (Person/Sq. Km.)		
		1981	1991	2001
<i>Western Tarai</i>	5,260	182	253	333
Nawalparasi	2,162	143	282	260
Rupandehi	1,360	279	284	521
Kapilbastu	1,738	155	214	277
<i>Mid-western Mountain</i>	21,351	11	12	14
Dolpa*	7,889	3	3	4
Jumla*	2,531	27	30	35
Kalikot*	1,741	50	51	61
Mugu*	3,535	12	10	12
Humla	5,655	4	6	7
<i>Mid-western Hill</i>	13,710	76	89	107
Pyuthan	1,309	120	134	162
Rolpa	1,879	89	96	112
Rukum	2,877	46	54	65
Salyan*	1,462	104	124	146
Surkhet*	2,451	68	92	118
Dailekh	1,502	111	125	150
Jajarkot	2,230	45	57	60
<i>Mid-western Tarai</i>	7,317	92	127	168
Dang	2,955	68	120	156
Banke	2,337	88	122	165
Bardiya	2,025	98	143	189
<i>Far-western Mountain</i>	7,932	36	42	50
Bajura*	2,188	34	42	50
Bajhang	3,422	36	41	49
Darchula	2,322	39	44	53
<i>Far-western Hill</i>	6,762	89	99	118
Achham	1,680	110	118	138
Doti	2,025	76	83	102
Dadeldhura	1,538	56	68	82
Baitadi	1,519	118	132	154
<i>Far-western Tarai</i>	4,845	88	140	205
Kailali	3,235	80	129	191
Kanchanpur	1,610	105	160	235

Source : CBS, 1995 p. 55

CBS, 2002, National Report

2.6 Age and Sex Composition

The two characteristics of the population that receive the most attention in demographic analysis are age and sex. Although, sex is a personal characteristic of a person, information on sex can normally be obtained without difficulty. Questions on age, however, may be subject to different interpretations in different cultures. The age-sex composition of a population is important in demographic analysis for various reasons. Age-sex structure is the product of past trends in fertility, mortality and migration and influences in turn the current levels of birth, death and migration rates. Moreover, the age-sex composition of a population has significant implications for the reproductive potential, manpower supply, school attendance, household formation, child-mother health care and family planning service delivery, ageing etc. This chapter deals with this topic in two sections. The first section analyses sex composition and the second section analyses age composition.

2.6.1 Sex Composition

The personal characteristics of sex hold a position of prime importance in demographic studies. Many types of planning, such as military, community constitutions and services, particularly health services require separate population data for males and females. The balance of sexes affects social and economic relationships within a community. Social roles and cultural patterns may be affected. The tabulations by sex are useful in the evaluation of census and survey data particularly with respect to the coverage of the population by sex and age.

The numerical measures of sex composition are few and simple to calculate. In this analysis two basic measures are taken into consideration.

- Sex ratio or masculinity ratio
- The percentage of males in the population or masculinity proportion.

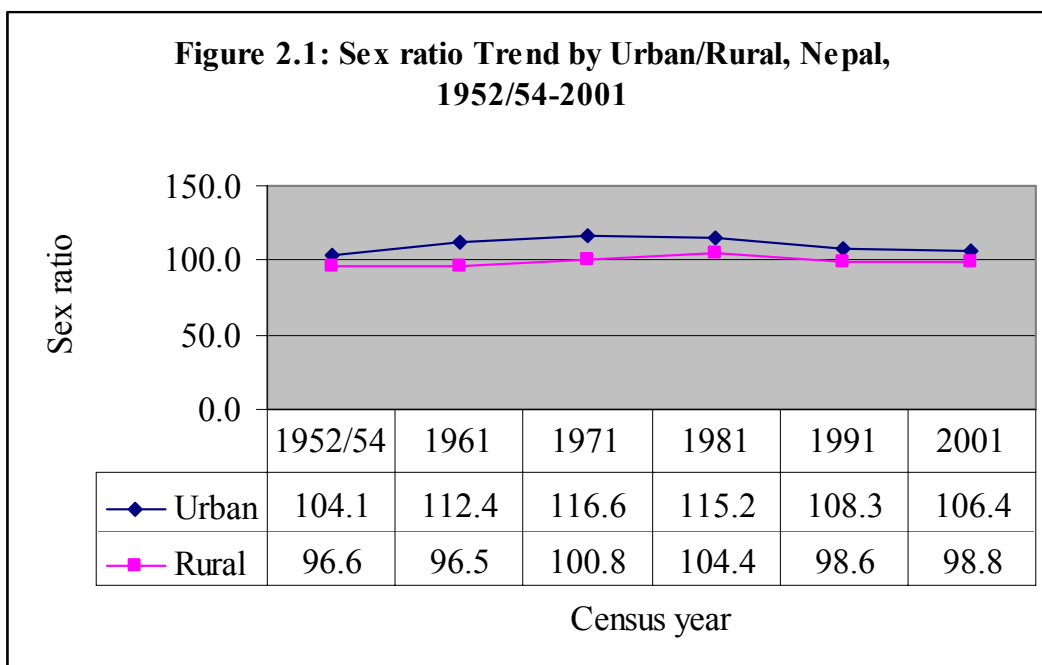
The sex ratio and masculinity proportion for the various censuses is shown in Table 2.14.

Table 2.14: Sex ratio of total population in censuses, Nepal , 1952/54-2001.

Year	Sex Ratio (M/F)*100	Masculinity Proportion (M/T)*100
1952/54	96.8	49.19
1961	97.3	49.25
1971	101.4	50.34
1981	105.0	51.22
1991	99.5	49.87
2001	99.8	49.95

Source : CBS, 1958, Table 2, p.60,
 CBS, 1975 Vol. I, Table 6
 CBS, 1984 Vol. I, Table 4
 CBS, 1991 Vol. I, Table 5
 CBS, 2002 National Report Vol. I, Table 1

The sex ratio is usually expressed as the number of males per hundred females. It can also be expressed as number of females per 100 males. However, in this analysis the first measure has been used.



Source : CBS (1995); CBS, National Report, 2002.

Note * For 1952/54 urban sex ratios are based on three towns of Kathmandu valley only.

Table 2.14 shows that sex ratios are found low in 1952/54, 1961, 1991 and 2001 censuses while in 1971 and 1981 censuses sex ratio are found higher. This indicates that most of the time females in Nepal are more in number than males. This low sex ratio might be because of the males used to go abroad for seeking jobs and female lived in Nepal. This is supported partially when we analyze the urban and rural sex ratios. Figure 2.1 shows that sex ratios are always more than hundred in urban areas but in rural areas lower than hundred except 1971 and 1981 censuses. But in these two censuses both in urban as well as rural areas male population was more than female population.

The sex ratios by age groups obtained in various censuses may further be analyzed and differentiated by age groups. Sex ratio by age groups in various censuses is presented in Table 2.15.

Table 2.15 : Sex ratios by five-year age groups, Nepal, 1952/54 – 2001.

Age Group	Census Year					
	1952/54	1961	1971	1981	1991	2001
0-4	98	98	94	106	103	103
5-9	103	103	103	104	104	103
10-14	114	114	118	117	108	106
15-19	102	102	110	110	96	99
20-24	88	86	93	91	85	88
25-29	89	90	96	96	89	91
30-34	89	91	91	92	92	95
35-39	100	104	108	107	101	99
40-44	89	89	98	100	95	99
45-49	102	101	114	114	104	104
50-54	92	92	104	115	106	105
55-59	102	100	107	119	116	112
60+	76	80	89	109	100	101

Source : Same as Table 2.14 and

CBS, 2002, National Report Vol. I, Table 10

Table 2.15 shows that the sex ratio in the age group 0-4 was less than hundred until 1971 census then greater than hundred. The sex ratio at birth is the number of male births per 100 female births. It is normally around 105, that is, 105 boys are born for every 100 girls, but do vary somewhat between populations and sub-groups. It would appear, that the sex-ratio pattern by age group in Nepal differs from that in other countries. However, it is not surprising, Karki (2002) pointed about studies of Vaidhyathan and Gauge (1973), Guvaju (1974), Krotki and Thakur, (1971); CBS (1976 and 1978) and Thapa and Retherford, (1982) all these studies indicated that male infant mortality rate is higher

than female infant mortality rate. However, since mortality is usually higher for males than females, all populations have more male than female births, so the sex ratio at the early ages is expected to be slightly over 100 (Arriga, 1994). This would seem to indicate that there is more accurate age reporting of infants, as well as reduction in male infant-mortality in 2001.

Sex ratio in the 10 -14-age groups is consistently high in all the censuses. Only since 1991 the sex ratio for 10 – 14 has been increasingly lowering and by 2001 it has become 106. The sex ratio for the population between the ages 25 to 34 is low throughout. This is quite consistent with Nepal's long tradition of male migration. In 2001, sex ratio becomes low from age group 15-19 and remains so until age group 40-44. It may be that male out migration started earlier than usual in recent years and their return home takes longer time than in the past. The higher sex ratios after ages 45 reflect male migrants generally returning home to join their families during retired life. This also indicates lower mortality in male and higher mortality in female population in the age group.

2.6.1.1 Sex Ratios of Population by Ecological Zone

Sex ratios by ecological zones are presented in Table 2.19 for the period 1952/54-2001. In Nepal, overall sex ratio is balanced with slightly more female than male in 1952/54, 1961, 1991, 2001 and slightly more male in 1971. However, marked dominance of male on sex ratio is observed in 1981. There are some variations in the sex ratios by Ecological Zone in Nepal. In 1981, all the Ecological Zones reported male dominance in sex ratios, whereas in 1991 and 2001 only Terai has male dominance in sex ratios. Table 2.19 also shows the increasing trend of male dominance in the sex ratios till 1981 for Terai, however compared to 1981, it slowed down in later years. On the other hand, Mountain and Hill also reported increasing male dominance till 1981; however female dominance in sex ratios is observed in 1991 and 2001 with slightly more female dominance in Hill. One of the reasons for this may be sex selective out migration from Hill and Mountains, with probably more male than female net migrants in the Hill.

Table 2.16 : Sex ratios of population by ecological zones, 1952/54-2001

Zone\Year	1952/54	1961	1971	1981	1991	2001
Mountain	-	-	100.79	104.71	98.43	98.39
Hill	95.95	94.26	98.02	102.14	95.34	95.84
Terai	100.1	102.14	106.39	108.33	103.85	103.77
Nepal	96.8	97.05	101.37	105.02	99.47	99.80

Source : CBS, 1995, p. 46

CBS, 2002 National Report

2.6.1.2 Sex Ratios of Population by Ecological Zones and Development Regions

Sex ratios by Ecological and Development Regions are presented in Table 2.17 for the period 1981-2001. Table shows the dramatic changes in the sex ratios by Development Regions in the Census years. In 1981, all the Development Regions had reported male dominance in the sex ratios, whereas in 1991 and 2001, Western, Mid-western and Far Western Development Regions observed female dominance with more females in Western Development Region.

The table also reveals that all Eco-development in the Terai has male dominance in sex ratios. In 1991, either male dominance or sex balance is observed except in Far western Hill, whereas female dominance is reported except in Central Hill in 1991 and 2001. It may be due to inclusion of Kathmandu in Central Hill, where more male are counted than female. In Western Hill, high female dominance in sex ratios is observed. In the case of Mountain, the entire eco development region has reported male dominance in 1981; interestingly the situation changed in 1991 and 2001. The male dominance is observed in Western and mid Western Mountains in 1991 and 2001, with very high male dominance in Western Mountain

Table 2.17: Sex ratio of population by ecological & development regions, Nepal, 1981-2001.

Ecological Zones	Year	Development Regions					Total
		Eastern	Central	Western	Mid Western	Far-western	
Mountain	1981	102	107	108	107	102	105
	1991	96	100	109	103	94	98
	2001	97	99	116	103	96	98
Hill	1981	101	106	100	100	92	102
	1991	97	102	88	96	92	95
	2001	97	103	87	97	94	96
Terai	1981	108	107	109	107	116	108
	1991	103	106	103	102	101	104
	2001	102	107	102	101	103	104
Nepal	1981	105	107	103	103	105	105
	1991	100	104	93	99	96	99
	2001	100	105	93	99	98	100

Source : CBS, 1995, p. 47

CBS, 2002 National Report

2.6.1.3 Sex Ratios of Population by District

The Sex ratios of Population by District are presented in Table 2.18. The table reveals that the sex ratios by district are varied according to Census years. In 1981, the sex ratio of population was reported least in Lamjung (90) followed by Shyangja (91) and Ramechhap (93), whereas it was highest in Kanchanpur (123) and followed by Arghakhachi (122). Similarly in 1991, the sex ratios were lowest in Gulmi (83) followed by Shyangja (90), whereas it was Highest in Mustang (109) followed by Manang (108), Parsa (108) and Kathmandu (108). On the other hand in 2001, least sex ratio was reported in Gulmi (82) followed by Kaski (83) and highest was in Mustang (120) and followed by Kathmandu (114).

Table 2.18 : Sex ratios of population by districts, Nepal, 1981-2001.

District	Sex Ratio		
	1981	1991	2001
<i>Eastern mountain</i>			
Taplejung	101	95	97
Sankhuwasabha	102	96	96
Solukhumbu	102	97	98
<i>Eastern Hill</i>			
Panchthar	99	97	96
Ilam	107	101	101
Dhankuta	104	97	97
Terhathum	98	95	94
Bhojpur	102	93	93
Okhaldhunga	96	95	93
Khotang	101	94	95
Udayapur	105	98	100
<i>Eastern Terai</i>			
Jhapa *	111	102	99
Morang	108	103	101
Sunsari	107	102	102
Saptari	105	103	104
Siraha	108	105	106
<i>Central Mountain</i>			
Dolakha	99	96	96
Sindhupalchok*	112	101	99
Rasuwa	108	107	109
<i>Central Hill</i>			
Kavrepalanchok	103	97	96
Lalitpur	113	103	104
Bhaktapur	105	100	104
Kathmandu	117	108	114

District	Sex Ratio		
	1981	1991	2001
Nuwakot	106	99	98
Sindhuli*	103	99	99
Ramechhap	93	93	90
Dhading	105	98	96
Makwanpur	106	103	103
<i>Central Terai</i>			
Dhanusa	108	107	109
Mahottari	107	107	108
Sarlahi	107	107	107
Rautahat	108	107	107
Bara	107	107	107
Parsa	106	108	110
Chitawan	106	98	99
<i>Western Mountain</i>			
Manang	102	108	111
Mustang	112	109	120
<i>Western Hill</i>			
Gorkha	98	92	87
Lamjung	90	90	89
Tanahu	103	90	87
Syangja	91	86	83
Kaski	102	93	95
Myagdi	115	90	87
Parbat	94	86	86
Baglung	99	87	85
Gulmi	94	83	82
Palpa	103	87	87
Arghakhanchi	122	87	86
<i>Western Terai</i>			
Nawalparasi	106	99	98
Rupandehi	108	103	104
Kapilbastu	113	106	106
<i>Mid-Western Mountain</i>			
Dolpa*	108	103	99
Jumla*	109	103	105
Kalikot*	106	101	102
Mugu*	108	104	103
Humla	109	106	107
<i>Mid-Western Hill</i>			
Pyuthan	96	87	86
Rolpa	96	92	94
Rukum	103	98	103

District	Sex Ratio		
	1981	1991	2001
Salyan *	100	98	100
Surkhet *	101	98	98
Dailekh	100	99	96
Jajarkot	109	101	103
<i>Mid-Western Terai</i>			
Dang	104	98	98
Banke	109	107	106
Bardiya	109	102	101
<i>Far-Western Mountain</i>			
Bajura	102	96	98
Bajhang	101	92	93
Darchula	105	97	96
<i>Far-Western Hill</i>			
Achham	94	89	89
Doti	96	93	100
Dadeldhura	106	93	94
Baitadi	103	92	94
<i>Far-Western Terai</i>			
Kailali	112	101	103
Kanchanpur	123	102	103

Source : CBS, 1995 p. 48

CBS, 2002, National Report

Table 2.19 : Ranking of sex ratios by number of districts, 1981-2001.

Group	1981	1991	2001
Less than 100	15	43	44
100 and more	60	32	31
Total	75	75	75

Source : Same as Table 2.18

Almost all Districts in the Terai are observed of having Male dominance in the sex ratios (Table 2.20). Female dominance in sex ratios is seen only in few Districts in 1991 and 2001, with slight increase in such Districts in 2001. Interestingly in the Hill, female dominance in the sex ratios are observed in large number of Districts in 1991 and 2001, however the District number has decreased in 2001. In Mountain, however female dominance in the sex ratios has been increasing, there is no variation in the number of Districts in 1991 and 2001.

Table 2.20 : Ranking of sex ratios by ecological zones and number of districts.

Sex ratios	Mountain			Hill			Terai		
	1981	1991	2001	1981	1991	2001	1981	1991	2001
Less than 100	1	7	9	14	33	29	--	3	4
100 and more	15	9	7	25	6	10	20	17	16
Total	16	16	16	39	39	39	20	20	20

Source: Same as Table 2.18

2.6.2 Age Composition

A significant feature of any population is the distribution of its members according to age, which facilitate the planners and policy makers in formulating effective socio-economic development plans for the population of different age groups. The percentage distribution of the population by sex and five-year age groups for the various censuses from 1971 to 2001 censuses of Nepal is presented in Table 2.21.

Table 2.21: Percent distribution of population by five year age groups, Nepal, 1971-2001.

Age group	1971		1981		1991		2001*	
	Male	Female	Male	Female	Male	Female	Male	Female
00-04	13.6	14.7	15.5	15.3	14.9	14.4	12.3	11.9
05-09	15.2	14.9	14.5	14.6	15.5	14.8	14.4	13.9
09-14	12.1	10.4	11.9	10.8	13.1	12.1	13.5	12.7
15-19	9.4	8.7	9.0	8.6	9.5	9.9	10.4	10.6
20-24	8.0	8.8	8.3	9.5	7.9	9.3	8.3	9.4
25-29	7.8	8.3	7.4	8.1	7.0	7.8	7.2	7.9
30-34	6.6	7.4	6.1	6.9	6.0	6.5	6.4	6.7
35-39	6.6	6.2	6.0	5.9	5.6	5.5	5.7	5.8
40-44	5.2	5.4	4.9	5.1	4.5	4.7	4.8	4.8
45-49	4.2	3.8	4.3	3.9	4.1	3.9	4.1	4.0
50-54	3.5	3.4	3.8	3.4	3.3	3.1	3.5	3.3
55-59	2.3	2.2	2.4	2.2	2.7	2.3	2.8	2.5
60-64	2.4	2.7	2.5	2.4	2.3	2.3	2.3	2.3
65+	3.0	3.2	3.4	3.1	3.6	3.4	4.2	4.2
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total No.	5817203	5738780	7695336	7327503	9220974	9270123	11359378	11377556

Source : Same as Table 2.15

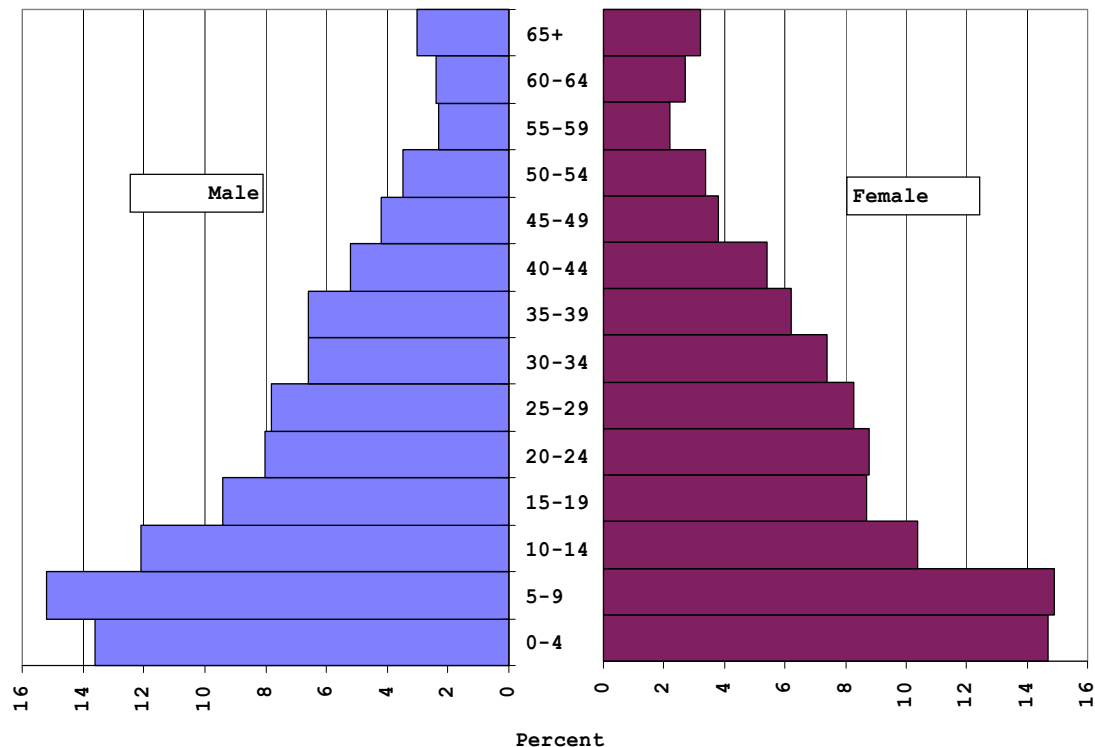
* Enumerated Population

Table 2.21 shows that in most cases except in 1981 census, the proportion of population of the age group 0-4 is relatively less than that of the age group 5-9. In general, a normal population, age distribution tends to be a smooth one in the sense that the proportions of the persons in each successive age group are less than in the preceding one. However, data shown in Table 2.21 and figure 2.2 is in contradicting this statement.

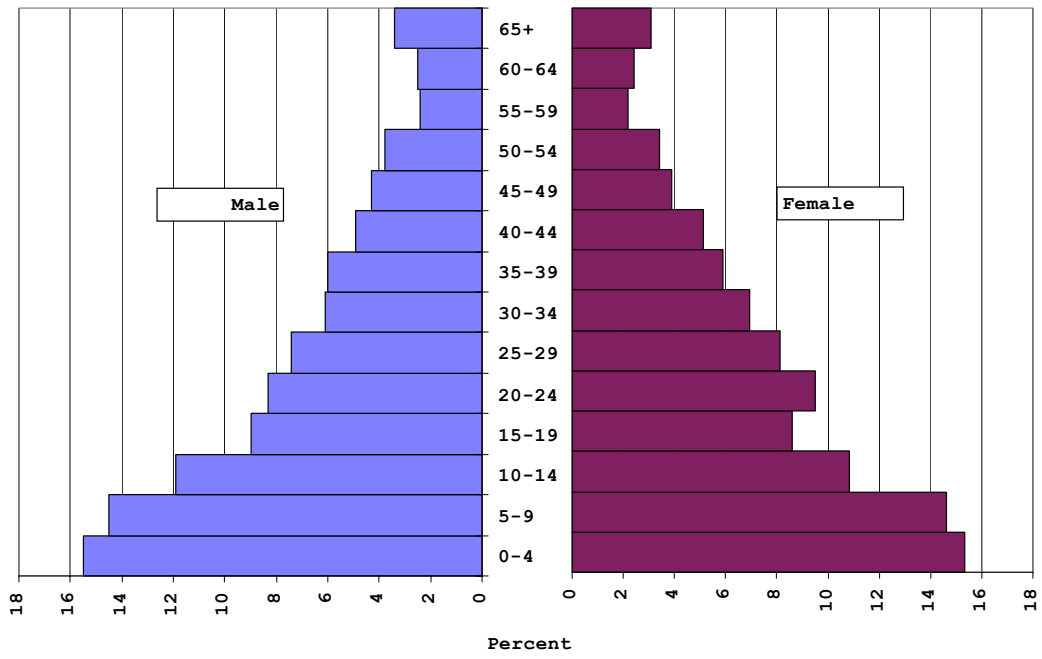
A population's age structure may be considered as a map of its demographic history. Population researchers often graphically illustrate the age composition of a population by use of the population pyramid. Graphical analysis of age-sex distribution (age-sex pyramid) technique has become a standard method in the evaluation of all population censuses (Shryock et al., 1976; US Bureau of the Census, 1985). Age sex pyramids graphically display demographic characteristics to improve understanding and easy comparison.

The population pyramid shown in figure 2.2 is constructed by computing a percentage distribution of a population simultaneously cross-classified by sex and age.

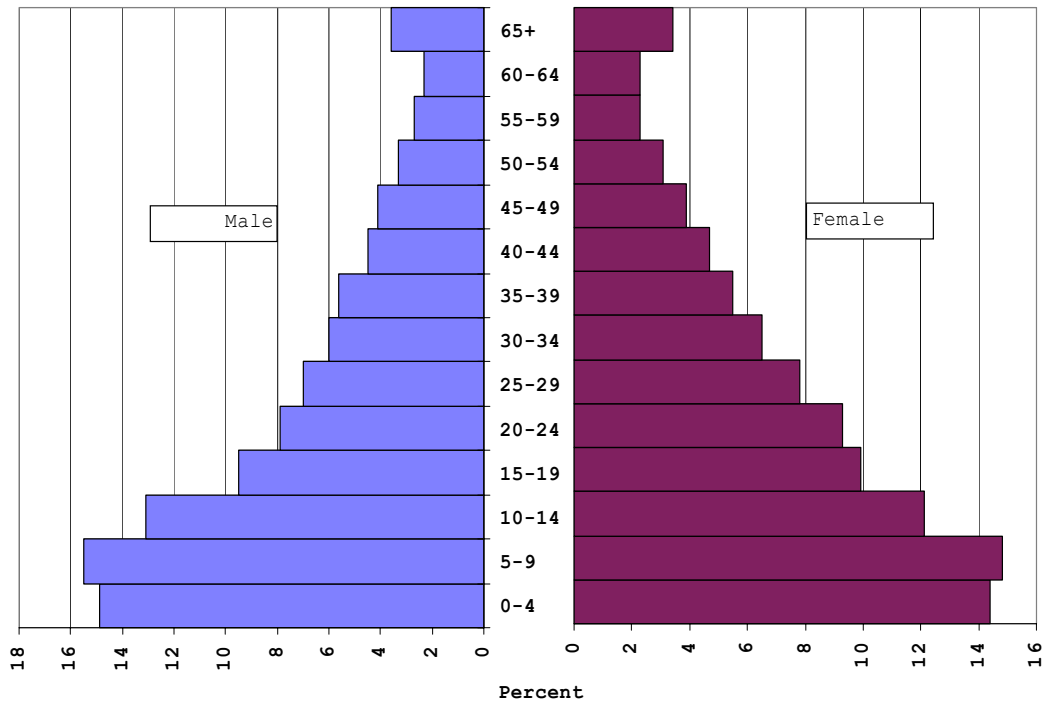
Figure 2.2: Population pyramids for 1971-2001 censuses.



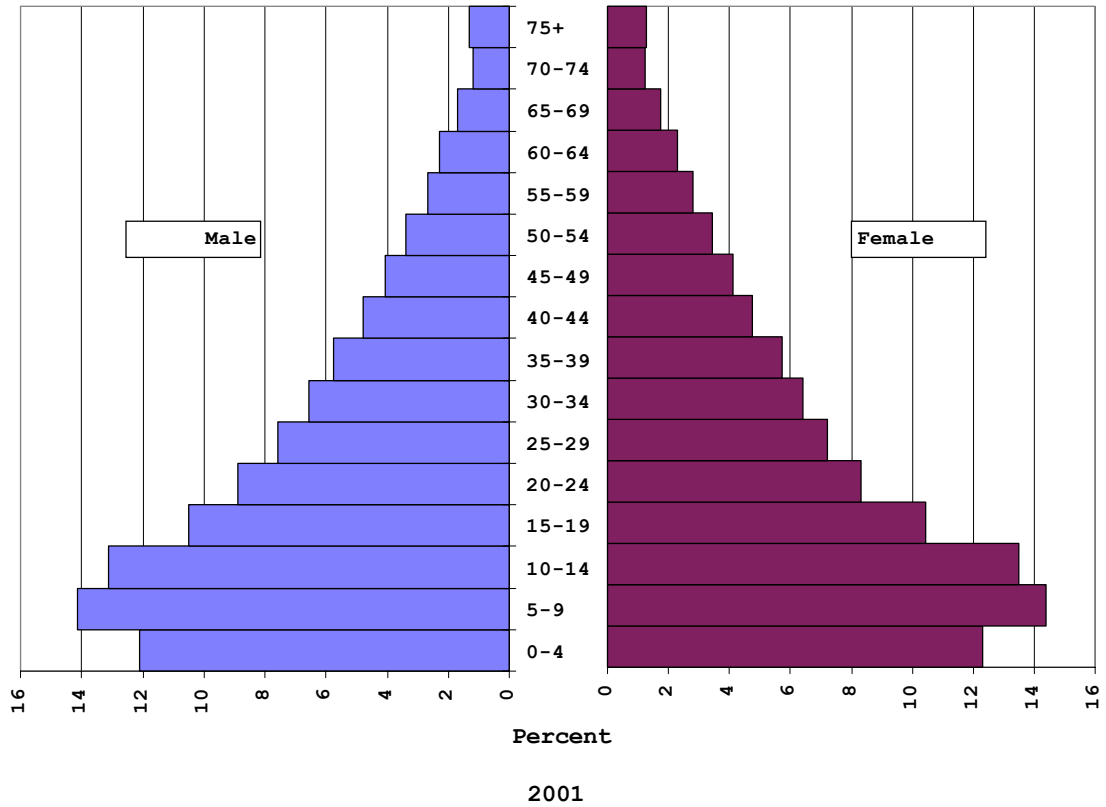
1971



1981



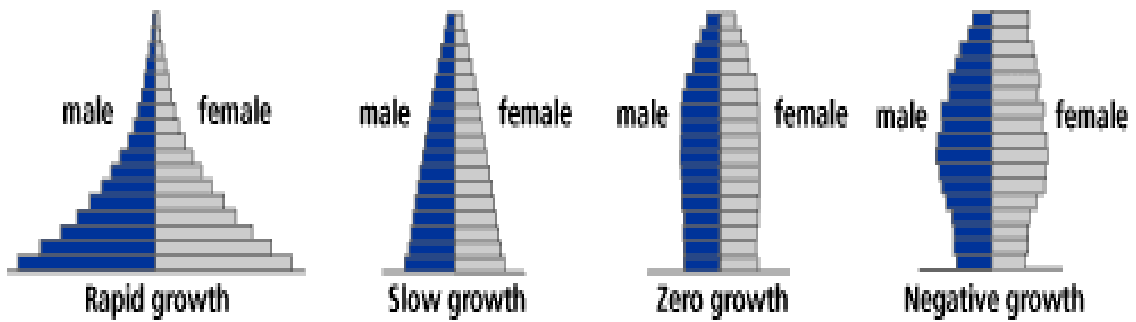
1991



Source: Same as Table 2.21.

Figure 2.2 indicates Nepal’s population growing rapidly. The overall shape of the pyramid indicates the potential for future growth. Four representations of population age-sex structure shown in figure 2.3 provide an overall example of what a pyramid for different levels of population growth would look like. Figure 2.3 presents pyramids for population with rapid growth, slow growth, zero growth, and negative growth.

Figure 2.3: Patterns of population change.



In the comparison if figure 2.2 and 2.3-population pyramid constructed for census data of Nepal look likes the first example of figure 2.3 i.e. rapid growth. This shape is the result of high birth rates that feed more and more people into the lowest bars and in turn shrink the relative proportion at the oldest ages. As the death rate declines, more people survive to the reproductive ages and beyond, and the births they have further widen the base of the pyramid. It reflects both a history of rapid population growth and the potential for future rapid growth.

2.6.2.1 Age Composition of Population for Urban/Rural Residence

The percentage distribution of the population by sex and five-year age groups for urban/rural areas of population census 2001 is presented in Table 2.22.

Percent distribution by age groups is shown in Table 2.22, for males as well as females. It is clearly seen that in the early age groups, There is a higher proportion of the population in the rural areas than in the urban areas. However in the working age group, a higher proportion of population, in the urban areas than in the rural areas have been reported. Similarly significant differences in proportion of population in the old age group can also be noted, with a higher proportion in the rural areas than in the urban areas. This indicates younger people (15-49) of rural areas might have gone to urban areas for work or study. In general, urban areas have facilities and many opportunities like schools, offices and industries etc. It is also noticed in Table 2.22, the population in age group 0-4 years is lower than the age group 5-9 and 10-14 years. This could be the effect of fertility and this is not surprising nowadays because fertility is declining. Although, both urban and rural areas have less population for age groups 0-4 years, in urban areas it is much less than in the rural areas, this reveals urban fertility is rapidly declining than the rural fertility.

Table 2.22 : Age distribution of population by sex and five years age groups for rural and urban, Nepal, 2001 Census.

Age Group	Urban		Rural	
	Male	Female	Male	Female
00-04	9.42	9.55	12.78	12.33
05-09	11.58	11.52	14.86	14.25
10-14	12.03	12.02	13.76	12.84
15-19	11.56	11.29	10.25	10.46
20-24	10.96	11.31	7.88	9.10
25-29	9.12	9.60	6.90	7.69
30-34	7.95	7.85	6.12	6.53
35-39	6.61	6.53	5.58	5.68
40-44	5.30	4.94	4.66	4.80
45-49	4.23	3.90	4.12	4.00
50-54	3.32	3.13	3.48	3.31
55-59	2.56	2.29	2.85	2.52
60-64	1.87	2.00	2.38	2.32
65-69	1.39	1.57	1.78	1.70
70-74	0.99	1.09	1.29	1.17
75+	1.11	1.40	1.30	1.31
All ages	100.00	100.00	100.00	100.00
Total No.*	1664362	1563517	9695016	9814039

Source : CBS 2002

* Enumerated Population

2.6.2.2 Age Composition of Population for Development Regions

The percentage distribution of the population by sex and five-year age groups for development regions of population census 2001 is presented in Table 2.23.

The Table 2.23 shows that the highest proportion of population has been found in the age group 5-9 years followed by a systematic decline in the subsequent age groups except in male population of mid western and far western regions, which is more or less the expected pattern. Like national and urban/distribution of population, the population in age group 0-4 years is lower than in the age group 5-9 years, this indicates the onset of fertility decline may have started. On the other hand one possible reason may be the under enumeration of 0-4 age group, which is discussed earlier in this chapter. In Table 2.23, it is also noticed that in proportion of the population in working age groups, the highest proportion of population is found in central development region. One reason for this may be because of the capital city, which lies in this region and many opportunities are obtained for work and study in this region.

Table 2.23 : Age distribution of population by sex and five years age groups for development regions, Nepal, 2001 Census.

Age Group	Eastern		Central		Western		Mid Western		Far Western	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
00-04	11.71	11.38	11.54	11.76	12.65	11.36	13.63	13.42	14.10	13.44
05-09	14.25	13.77	13.72	13.78	14.85	13.37	15.03	14.64	15.38	14.59
10-14	13.26	12.59	12.69	12.18	14.59	13.11	14.14	13.42	14.17	13.31
15-19	10.66	10.71	10.25	10.05	10.74	10.98	10.20	11.07	10.28	10.63
20-24	8.23	9.43	8.98	9.60	7.29	9.05	8.29	9.49	8.33	9.30
25-29	7.17	8.00	7.99	8.38	6.03	7.44	7.22	7.75	6.95	7.66
30-34	6.46	6.87	7.06	7.15	5.43	6.35	6.14	6.26	5.93	6.12
35-39	6.00	5.99	6.13	5.97	5.05	5.68	5.52	5.47	5.26	5.36
40-44	5.01	4.97	4.98	4.89	4.47	4.89	4.46	4.52	4.18	4.41
45-49	4.34	4.08	4.18	3.93	4.08	4.16	3.97	3.81	3.77	3.82
50-54	3.53	3.33	3.41	3.19	3.62	3.52	3.36	3.12	3.24	3.18
55-59	2.81	2.49	2.71	2.48	3.05	2.72	2.76	2.26	2.72	2.33
60-64	2.30	2.19	2.24	2.29	2.67	2.49	2.09	1.98	2.16	2.30
65-69	1.74	1.68	1.68	1.75	2.13	1.88	1.40	1.24	1.47	1.52
70-74	1.24	1.16	1.20	1.22	1.64	1.37	0.94	0.80	1.02	0.96
75+	1.30	1.37	1.24	1.38	1.69	1.61	0.84	0.77	1.03	1.07
All ages	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total No.*	2642320	2644570	4088292	3900320	2198170	2372843	1349073	1358171	1081523	1101652

Source : CBS 2002

* Enumerated Population

2.6.2.3 Age Composition of Population for Ecological Zones

The percentage distribution of the population by sex and five-year age groups for ecological zones of population census 2001 is presented in Table 2.24.

Percent distribution by age groups shown in Table 2.24, reveals, as discussed earlier, the lower proportion of population in age group 0-4 years in all regions and this shows in the onset of fertility decline in all regions of the country. After age group 5-9 years the percentage decreases more or less with increasing age in the expected pattern.

Table 2.24 : Age distribution of population by sex and five years age groups for ecological zones, Nepal, 2001 census.

Age Group	Mountain		Hill		Terai	
	Male	Female	Male	Female	Male	Female
00-04	12.69	12.40	12.10	11.32	12.39	12.48
05-09	14.49	14.00	13.98	13.16	14.71	14.52
10-14	13.68	13.10	14.00	13.11	13.05	12.32
15-19	10.18	10.44	10.82	11.14	10.14	10.06
20-24	7.87	8.74	8.45	9.57	8.29	9.34
25-29	6.64	7.26	6.88	7.76	7.61	8.22
30-34	6.23	6.23	6.29	6.50	6.50	6.97
35-39	5.52	5.58	5.40	5.68	6.05	5.94
40-44	4.79	4.89	4.65	4.79	4.84	4.84
45-49	4.19	4.02	3.94	3.98	4.29	3.99
50-54	3.61	3.57	3.49	3.45	3.41	3.08
55-59	2.93	2.67	2.90	2.61	2.71	2.35
60-64	2.60	2.65	2.40	2.39	2.19	2.11
65-69	1.88	1.83	1.88	1.81	1.58	1.54
70-74	1.35	1.26	1.36	1.24	1.14	1.08
75+	1.37	1.36	1.46	1.50	1.10	1.16
All ages	100.00	100.00	100.00	100.00	100.00	100.00
Total No.*	746814	758218	4930807	5146228	5681757	5473110

Source : CBS 2002

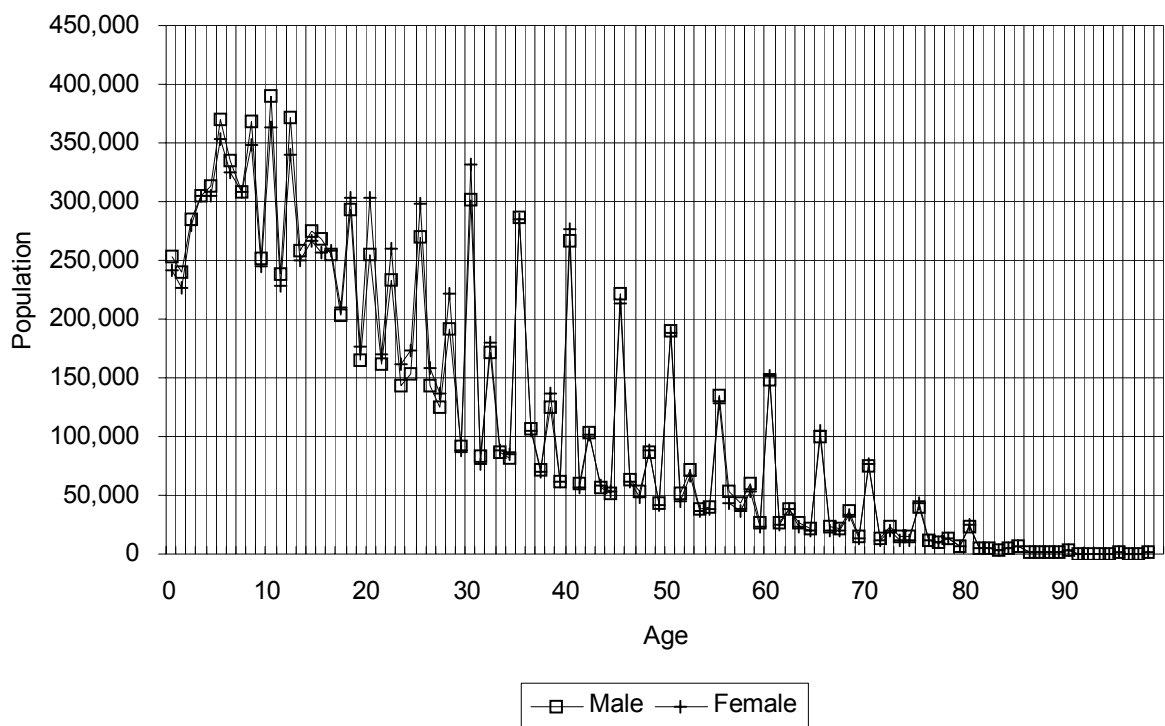
* Enumerated Population

2.7 Age Data and its Accuracy

One of the basic but vital information provided by a census is the age profile of the population. It is therefore important to evaluate the accuracy of the age distribution. Age misreporting, in particular, digit preference for ages ending in 0 or 5, is common in censuses and surveys in most developing countries. It is also very common for one person to become the main respondent and to supply all the information on all the members of the households. This is also evident in the censuses of Nepal. Experience shows that proxy respondents contribute a large part of age misreporting. In other hand, in many developing countries exact knowledge of one's age is not important and registration of births is uncommon, so it is difficult to obtain correct information on age.

The single year age distribution by sex of population in census 2001 is shown in figure 2.4.

Figure 2.4: Single year age distribution by sex of population census 2001



Source: CBS, National Report, Volume I, Table 9

Figure 2.4 shows that the age distribution of both male and female clearly suggests heaping of ages ending in certain digits. It is also observed that age heaping before 20 in both sexes are not clearly seen in figure but after age 20 age heaping is found in ages ending in 0 and 5 digit. So, for analysis before age 20, age distribution of single age up to age 20 is shown Table 2.25.

Table 2.25 : Percent total population by single years up to age 20, by sex, Nepal 1971-2001.

Age	2001		1991		1981		1971	
	Male	Female	Male	Female	Male	Female	Male	Female
0	2.22	2.13	3.12	3.00	2.3	2.67	2.48	2.55
1	2.11	1.99	2.55	2.43	3.42	3.06	2.26	2.39
2	2.51	2.46	2.92	2.85	3.21	3.3	2.87	3.17
3	2.69	2.68	3.16	3.15	3.06	3.24	3.12	3.56
4	2.76	2.68	3.13	2.98	3.08	3.07	2.86	3.03
5	3.25	3.10	3.54	3.34	3.53	3.51	4.04	4.06
6	2.95	2.85	3.16	3.02	2.93	3.04	2.73	2.74
7	2.72	2.71	3.02	2.95	2.72	2.87	2.76	2.88
8	3.25	3.05	3.18	2.98	3.01	2.89	3.03	2.73
9	2.21	2.15	2.61	2.55	2.32	2.35	2.66	2.54
10	3.43	3.20	3.27	2.97	3.2	2.85	3.26	2.69
11	2.10	2.01	2.24	2.04	1.83	1.69	1.87	1.7
12	3.27	2.98	3.12	2.02	3	2.61	3.12	2.48
13	2.27	2.20	2.24	2.11	1.84	1.7	1.82	1.63
14	2.42	2.34	2.23	2.12	2.09	1.91	2.02	1.85
15	2.36	2.25	2.21	2.12	2.03	1.84	2.42	2.06
16	2.25	2.26	2.04	2.06	2.12	1.95	2.06	1.86
17	1.79	1.85	1.57	1.67	1.36	1.34	1.32	1.32
18	2.59	2.67	2.31	2.49	2.29	2.26	2.44	2.33
19	1.46	1.55	1.39	1.48	1.25	1.24	1.18	1.14
20	2.24	2.66	1.97	2.43	2.13	2.69	1.97	2.32

Source : Same as Table 2.15 and

CBS, 2002, National Report Vol. I, Table 10

Table 2.25 shows age 15 in both sexes are not found more reported than the ages 14 and 16 although age 5, 10 and 20 have been found to be reported more than the preceding and succeeding ages. The ages of infants and children are probably reported more accurately than the ages of adults. There are two important reasons for this. First, the ages of children are generally reported by parents and the second is the ability to guess a child's age with reasonable accuracy (UNFPA, 1993).

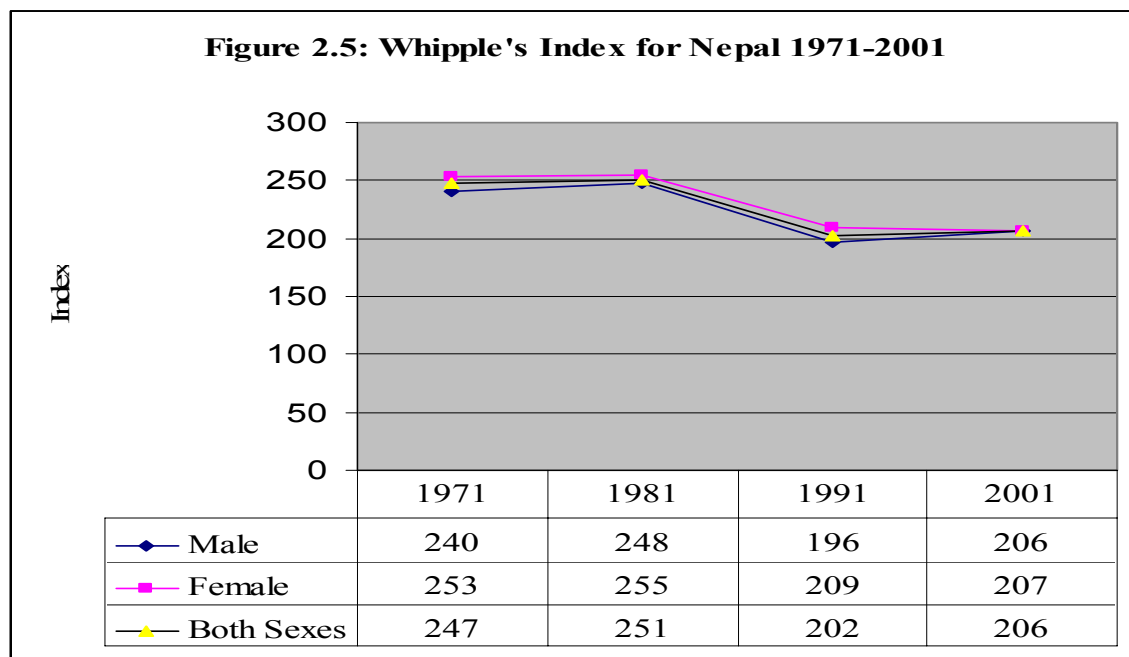
It is of some interest to measure age accuracy by an index for comparative purposes to establish, for example, whether the age statistics of one census are more accurate than that of another census. In this analysis, Whipple's, Myer's 'Blended' and 'Digit Preference' and United Nations age-sex accuracy indices are carried out for checking age data and comparison between the various censuses.

2.7.1 Whipple's Index

An indicator of the degree of age heaping is the Whipple's index, which ranges from 100 when there is no preference for 0 and 5 and up to 500, when only ages ending in 0 and 5 are reported (Newell, 1988). Between these extremes, the following scale for estimating the reliability of the age data has been suggested by the United Nations:

<u>Quality of the Data</u>	<u>Whipple's Index</u>
Highly accurate	Less than 105
Fairly accurate	105-109.9
Approximate	110-124.9
Rough	125-174.9
Very rough	175 and over

The Whipple's indices calculated for Nepal census data are presented in figure 2.3

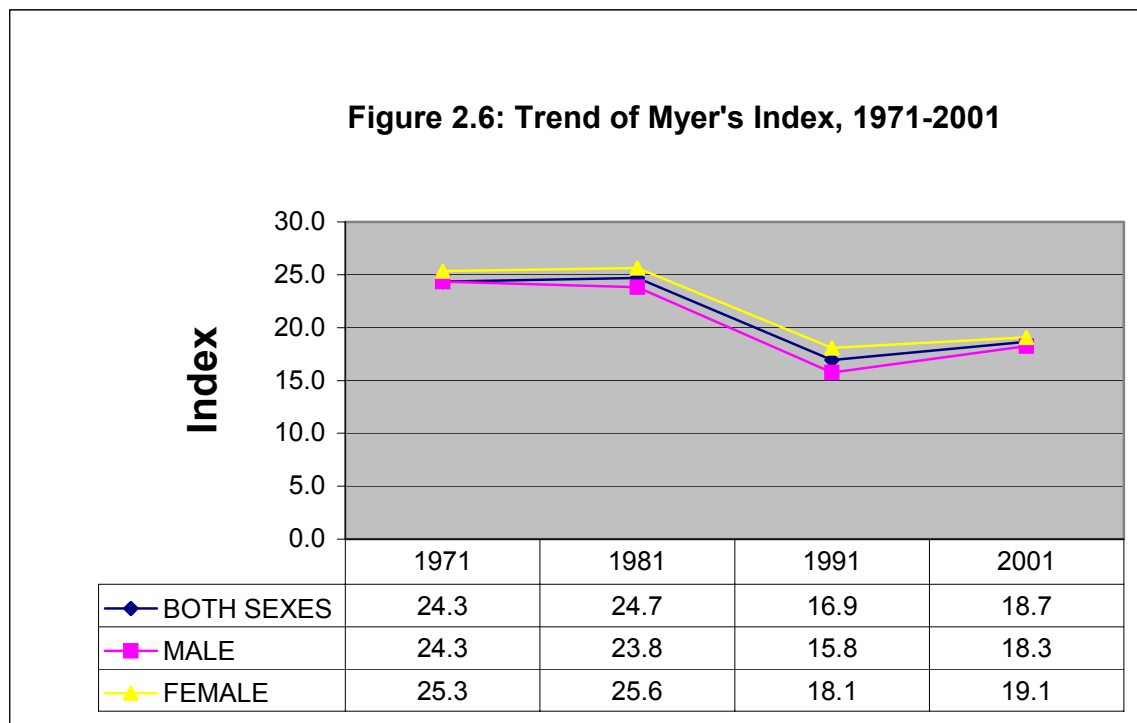


Source: Same as figure 2.4

The Whipple's indices in all censuses indicate a high case of digit preference. In all censuses both male and female (figure 2.3) shows that Whipple's indices are more than 175. United Nation's describes data with an index of this magnitude as very rough.

2.7.2 Myers' Blended Index

Another method of measuring age heaping is 'Myers' Blended Index' developed by Myers (Myers, R. J. 1940). Myer has developed a 'Blended' method to yield an index of preference for each terminal digit representing the deviation from 10 percent of proportion of the total population reporting the given digit. A summary index of preference for all terminal digits is derived as one half the sum of the deviation from ten percent each taken without regard to sign. The 'Myers' Blended Index' calculated for Nepal census data are presented in figure 2.6 and Myer's index of digit preference is shown in Table 2.26.



Source: Same as figure 2.4

Figure 2.6 shows there is no improvement in age reporting between 1971 and 1981 although in 1991 and 2001, the situation looks better Myer's index does not appear to have improved. If age heaping were non-existent, the index would approximate to zero. The theoretical range of the index is 0 representing no heaping and 90 indicating as if all ages are reported at a single digit.

Table 2.26: Myer's index of digit preference by sex for census years, Nepal, 1971-2001.

Digits	Male				Female			
	1971	1981	1991	2001	1971	1981	1991	2001
0	10.7	12.7	7.5	8.6	13.8	14.8	9.6	9.5
1	-3.7	-4.0	-2.5	-3.5	-4.0	-4.3	-3.4	-3.9
2	1.2	0.7	0.8	0.9	0.7	0.6	1.0	0.8
3	-4.8	-4.5	-3.1	-3.2	-5.0	-4.6	-3.5	-3.2
4	-3.8	-3.8	-2.4	-2.7	-3.7	-3.8	-2.6	-2.7
5	10.2	9.9	7.2	7.5	9.6	9.6	7.3	7.3
6	-1.9	-2.1	-1.6	-1.6	-2.7	-2.8	-2.0	-1.8
7	-4.2	-4.2	-2.5	-3.0	-4.6	-4.7	-3.1	-3.1
8	1.3	0.5	0.7	1.2	1.2	0.7	0.7	1.5
9	-5.1	-5.1	-3.8	-4.1	-5.3	-5.4	-4.0	-4.3

Source : Same as Table 2.21

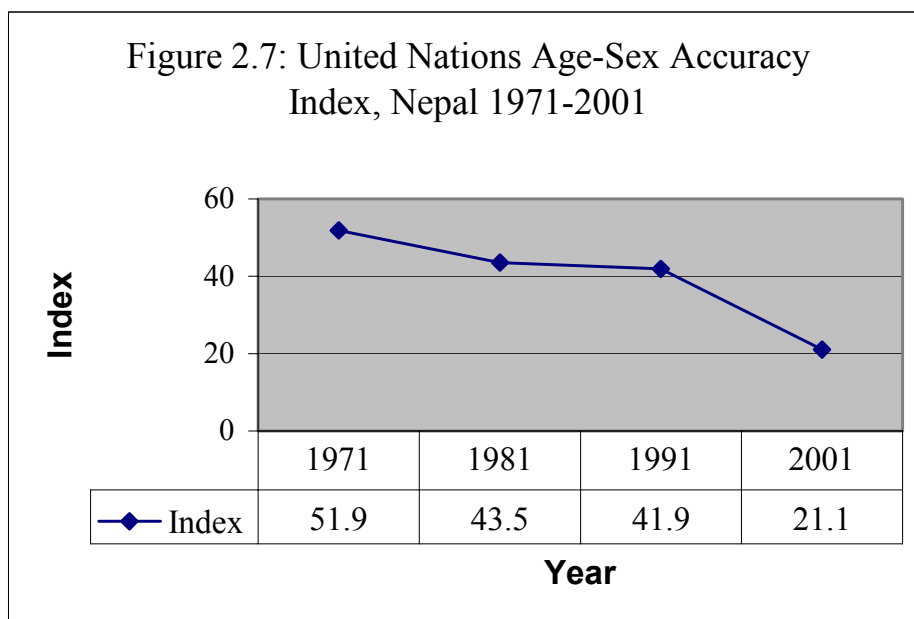
Table 2.26 shows that in all censuses, there was a tendency both among males and females to overstate their ages ending in digits 0 and 5 and understate ages ending in digits 1,3,4, 6, 7 and 9. There is also some overstating in digits 2 and 8. However, all censuses found age heaping in certain digits. However 1991 and 2001 censuses found comparatively better age reporting of both males and females.

2.7.3 United Nations Age-Sex Accuracy Index

The UN age-sex accuracy index or UN joint scores combines indices or accuracy of the distribution and accuracy in sex ratio to come up with single index measuring the accuracy of age-sex distribution of a census. The following scale for estimating the reliability of the age data has been suggested by the United Nations:

<u>Quality of the Data</u>	<u>UN Age sex Accuracy Index</u>
Accurate	under 20
Inaccurate	20-40
Highly inaccurate	over 40

The UN Age sex Accuracy Index calculated for Nepal census data are presented in figure 2.7.



Source: Same as Table 2.21

Figure 2.7 shows that in 2001, there is sharp decline in index even though the quality of data rated is inaccurate. The UN Age Sex Indices found very high prior to the census 2001 which all are rated highly inaccurate are found to have declined sharply in 2001. Although, in 2001 census the UN Age Sex Index found the value 21.1 is in boarder line i.e. below 20 considered as accurate. When single year data are grouped into five-year age groups, some of the peaks and troughs are eliminated. This is the advantage of UN Age Sex Index over the Whipple and Myer's Index. This may be the one reason, however, there is not much difference in Whipple and Myer's index in various censuses but UN Age Sex Index is found to have sharply declined.

There are many types of errors and biases in the censuses age data. However, the trend has been toward greater accuracy and reliability.

2.8 Index of Ageing and Median Age of Population

Computing index of ageing or aged-child ratio and median age of the population may further carry out the analysis of age composition. The index of ageing is defined as the ratio of population over 60

to the children under age 14 multiplied by hundred. The index of ageing and median age of population are calculated by sex and presented in Table 2.27.

Table 2.27 : Index of ageing and median age by sex, Nepal, 1971-2001.

Census Year	Index of Ageing			Median Age		
	Male	Female	Total	Male	Female	Total
1971	13.20	14.75	13.86	19.80	20.70	20.30
1981	14.08	13.51	13.81	19.50	20.30	19.90
1991	13.56	13.80	13.58	18.41	19.40	18.92
2001	16.51	16.32	16.70	19.00	20.00	20.00

Source: Source: Same as 2.21

Note : Median of age is calculated based on age- grouped data prior to 2001 census data. In 2001 census data median age is calculated based on single year data. If we calculate from grouped data median age found for male = 19.71, female = 20.47 and total = 20.08 for 2001.

Table 2.27 shows that index of ageing was lower than 15 per cent prior to the census 2001 and in 2001 census it is around 16 percent. This indicates most of the times Nepal's population have young generations, although it is slightly shifting to the old. The population may be described as young if the index of ageing is under 15 percent and old if its value is over 30 percent (Singh and Syami, 1990).

For analysis of age composition median age is also calculated and this measure also indicated that Nepal's population was always young. Median age of the population is defined as that age of the population, which divides the total population below the median as younger and above the median as older. A population may be described as young, intermediate and old if the median age lies under 20, between 20 to 29 and over or equal to 30 years respectively. The median age for most of the countries lie in the limit 16 to 36 years.

2.9 Age Smoothing

Census data on age distribution of population, as analyzed earlier are found to have errors due to inaccurate reporting of ages and some of the errors may be due to under enumeration. The UN Age Sex Accuracy Index, is improved in census 2001 than prior censuses. This indicates these errors are

less pronounced in five-year age distribution rather than in single year age distribution. When the age structures of the population are not correct, a decision has to be made to adjust the age distribution. Smoothing techniques have frequently been made for correcting data for age misreporting. Mainly two techniques, without modifying the total population size and slightly modifying total population size are used for age smoothing. In both techniques, light smoothing and strong smoothing to be used depends on the errors in the age and sex distribution. In this analysis, Carrier-Farrag, Karup-King Newton, Arriga, United Nations and strong smoothing techniques were carried out for age smoothing in 2001 census data by using software program AGESMTH and is presented in Table 2.28.

Table 2.28 : Reported and smoothed population by age and sex, Nepal, 2001.

Sex and Age	Reported	Carrier Farrag*	K.-King Newton**	Arriaga***	United Nations	Strong****
Male						
Total, 0-79	11,296,859			11,296,859		11,296,859
Total, 10-69	8,044,044	8,044,044	8,044,044	8,044,044	8,050,591	8,044,044
0-4	1,395,715			1,526,268		1,566,644
5-9	1,633,087			1,502,534		1,462,158
10-14	1,533,806	1,451,203	1,438,631	1,452,021	1,516,953	1,350,441
15-19	1,185,826	1,268,429	1,281,001	1,267,611	1,207,897	1,202,574
20-24	946,742	958,861	967,768	956,070	952,183	1,022,562
25-29	821,014	808,895	799,988	811,686	816,506	881,142
30-34	726,040	736,832	736,075	735,603	728,945	741,352
35-39	651,351	640,559	641,316	641,788	642,933	638,494
40-44	539,993	546,456	546,477	545,033	547,838	552,419
45-49	469,695	463,232	463,211	464,655	466,100	472,206
50-54	392,659	390,633	390,096	389,149	392,348	394,719
55-59	318,610	320,636	321,173	322,120	321,251	326,237
60-64	262,255	262,020	259,608	259,219	259,179	261,568
65-69	196,053	196,288	198,701	199,089	198,457	200,332
70-74	141,678			140,516		140,860
75-79	82,335			83,497		83,153
80+	62,519					

Table 2.28: Reported and smoothed population by age and sex, Nepal, 2001(cont.)

Sex and Age	Reported	Carrier Farrag*	K.-King Newton**	Arriaga***	United Nations	Strong****
Female						
Total, 0-79	11,310,380			11,310,380		11,310,380
Total, 10-69	8,156,987	8,156,987	8,156,987	8,156,987	8,171,513	8,156,987
0-4	1,359,498			1,488,485		1,510,831
5-9	1,578,355			1,449,369		1,427,022
10-14	1,448,126	1,391,443	1,385,861	1,393,992	1,448,616	1,336,592
15-19	1,203,176	1,259,859	1,265,441	1,257,310	1,226,347	1,213,060
20-24	1,070,026	1,063,904	1,064,029	1,061,423	1,057,452	1,069,860
25-29	904,464	910,586	910,461	913,067	907,257	932,694
30-34	763,463	771,580	772,180	769,457	766,976	785,612
35-39	659,302	651,185	650,585	653,308	655,058	667,497
40-44	548,051	549,102	548,732	547,145	549,723	555,064
45-49	453,678	452,627	452,997	454,584	454,986	464,079
50-54	373,395	361,199	362,933	360,062	367,243	379,475
55-59	283,483	295,679	293,945	296,816	294,886	310,746
60-64	258,653	256,039	252,495	253,062	248,727	250,380
65-69	191,170	193,784	197,328	196,761	194,240	191,927
70-74	132,111			138,190		135,235
75-79	83,429			77,350		80,305
80+	67,176					

Source : CBS, National Report 2002, Volume I, Table 9

Note: * The Carrier –Farrag technique is based on the assumption that the relationship of a 5- year age group to its constituent 10-year age group is an average of similar relationships in three consecutive 10-year age groups.

** The Karup-King Newton formula assumes a quadratic relationship among each three consecutive 10-year age groups.

*** Arriga Formula assumes that a second-degree polynomial passes by the midpoint of each three consecutive 10- year age groups and then integrates a five-year age group.

**** Strong smoothing procedure follows in the first step smooth the results in ten years age groups then adjusts the results in smooth ages then separates the smoothed 10- year age groups into 5- year age groups. For detail please see Ariga, 1994.

An attempt was made for population projection to smooth the age data of 2001 population census by employing the Hill Technique. The use of the Hill Technique in leveling out the inconsistencies in the age structure was satisfactory everywhere, except at ages between 20 and 29 for females (CBS, 1987). The reported and smoothed age distribution calculated by using Hill Technique is presented in Table 2.29.

Table 2.29 : Reported and adjusted 5 -year age distribution by Hill technique, Nepal, 2001.

Age Groups	Reported			Adjusted		
	Total	Male	Female	Total	Male	Female
0-4	2805432	1420848	1384585	3168560	1629110	1539450
5-9	3269974	1662494	1607480	3038060	1545440	1492620
10-14	3036274	1561425	1474848	2891580	1463450	1428130
15-19	2432557	1207179	1225378	2483820	1218870	1264950
20-24	2053561	963790	1089771	2119350	1014630	1104720
25-29	1756952	835798	921154	1806373	860346	946027
30-34	1516665	739114	777551	1544853	750970	793883
35-39	1334548	663080	671468	1309530	648741	660789
40-44	1107881	549717	558164	1098296	549778	548518
45-49	940203	478153	462050	913668	463030	450638
50-54	780015	399730	380285	755015	388062	366953
55-59	613061	324347	288714	619807	319610	300197
60-64	530403	266977	263426	496652	253824	242828
65-69	394281	199583	194698	374473	190162	184311
70-74	278778	144229	134549	250738	127864	122874
75-79	168786	83818	84969	161578	82007	79571
80+	132051	63639	68412	119070	58027	61043
Total	23151423	11563921	11587502	23151423	11563921	11587502

Source : CBS, National Report 2002, Volume I.

2.10 Conclusion

This chapter examined the size, growth, distribution and age sex structure of the Nepalese population. Nepal's population of 23.1 million in 2001 census was around 4.6 million greater than in 1991 census and over 17.5 million more than the 1911 population census of 5.6 million. The main component of Nepal's population growth has been natural increase. Although, Nepal's population is small compared to neighboring countries China and India, both having more than billion people, looking at the growth rate and other resources of the country, this is the proper time for thinking about population policies.

The population size, growth and density vary according to geographical and administrative divisions. For many purposes information on the size and characteristics of the total population of a nation is not sufficient. Population data are often needed for geographic divisions of a country and urban and rural

areas. In Nepal, the geographic distribution of the population is not even but is dense in some places and sparse in others. There are urban centers where thousands of people live within a few square kilometers, and there are also vast stretches of mountains where the population averages only one or two persons per square kilometer. The share of total population in Terai is increasing year by year. It is true that fertility, mortality and also boundaries changes are the contributing factors in the population size, growth and distribution by geographical and administrative divisions, variations in the net migration is also responsible for spatial changes in the population of the country. . Although, human being live in some of the remote places, the places where people live are strongly correlated with climate, soil quality and availability of local resources. Considering these wide varieties of reasons, population policies need to be addressed about population redistribution and planned urbanization in a systematic manner. Moreover, proper attention should be given in resource distribution and mobilization also respecting the right of individuals to live and work in the community of their choice.

Aside from the total size, the most important demographic characteristic of a population is its age and sex structure, or the proportion of people at each age, by sex. The analysis of age sex composition of various census data indicates there was a tendency both among males and females to overstate their ages ending in digits 0 and 5. Although, there are many types of errors, when single year data are grouped into five-year age groups, the trend has been toward greater accuracy and reliability. Since, the age-sex composition of a population is important in demographic analysis for various reasons, the quality of population data needs to be improved. Concerted efforts at several levels such as, improved training of the collectors, enlightening or educating the people about the importance and accuracy of their responses in census and survey operations are only few among them that need to be stressed before any improvement in the data quality can be expected.

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