ANNEX 2 Sources of data, technical notes and values of human development indices

ANNEX 2.1 *Sources of data*

The major data source used to produce the human development index (HDI) and other related indices is the Nepal Demographic and Health Survey (NDHS) 2006 and Nepal Living Standards Survey (NLSS) 2003/04. Other data sources, such as Nepal Family Health Survey (NFHS) 1991 and 1996, the National Census 2001, the Local Election Data Tape, and earlier human development reports of the country were also used to supplement the estimated figures from the NDHS 2006, as well as to collate and verify them. The major objectives of these surveys, their sample sizes, data collection procedures and limitations are presented in detail in the respective reports. A brief summary of data sources and its use in this Report is shown in Table 1 below:

TABLE 1 Major sources of data used to calculate the HDI and related indices

Sources of Data/ Publications	Organisation	Indicators/ Components	Calculated indices
NDHS 2006	MOHP Nepal, New ERA Nepal and Macro International Inc, USA	▸ Life expectancy index, deprivation in longevity ▸ Education index: adult literacy index and mean years of schooling index ▸ Equally Distributed Equivalent Percentage (EDEP) for administrative and managerial; and professional and technical positions ▸ Proportion of population without safe water ▸ Proportion of underweight children under five years of age and health deprivation index	▸ HDI ▸ GDI ▸ GEM ▸ HPI
National Census 2001 data tape	GON, Central Bureau of Statistics	▸ Percentage share of male and female in total population ▸ Proportion of people not surviving beyond 40. (Used for verification of the 2006 index)	▸ HDI ▸ GDI ▸ GEM ▸ HPI

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Sources of Data/ Publications	Organisation	Indicators/ Components	Calculated indices
NDHS 2001 NFHS 1996 NFHS 1991	MOHP Nepal, New ERA Nepal and Macro International Inc, USA GON, Department of Health, Kathmandu	(Used for the verification of the 2006 index)	▸ HDI ▸ GDI ▸ GEM ▸ HPI
Local Election data tape	GON, Election Commission Nepal	▸ Election data for parliamentary representation	▸ GEM
National Account of Nepal	GON, Central Bureau of Statistics, NPC, Kathmandu	▸ GDP by sectors	▸ HDI ▸ GDI
NLSS 2003/04	GON, Central Bureau of Statistics, NPC, Kathmandu	▸ Income index: Per capita income by different caste and ethnic groups	▸ HDI by caste and ethnic groups
NDHS 2006 Caste, Ethnic and Regional Identity in Nepal: Further Analysis of 2006 NDHS	MOHP Nepal, New ERA Nepal and Macro International Inc, USA	▸ Education index: Literacy rates and mean years of schooling by caste and ethnic groups ▸ Life expectancy index: Life expectancy by caste and ethnic groups	▸ HDI by caste and ethnic groups

NFHS = Nepal Family Health Survey; NDHS = Nepal Demographic and Health Survey; and NLSS = Nepal Living Standards Survey

ANNEX 2.2 *Technical notes—calculating HDI and other related indices*

Human development index

The HDI is a summary measure of human development that has three dimensions:

1. A long and healthy life measured by life expectancy at birth;
2. Knowledge, measured by an aggregate of the adult literacy rate (two-thirds) and the combined gross primary, secondary and tertiary enrolment rates (one-third); and
3. A decent standard of living, measured by gross domestic product (GDP) per capita in purchasing power parity (PPP) US dollars.

An index is created for each of these three dimensions by choosing maximum and minimum values for their indicators. Performance in each dimension is expressed as a value between 0 and 1 by using the following formula:

$$\text{Dimension index} = \frac{(\text{actual value} - \text{minimum value})}{(\text{maximum value} - \text{minimum value})}$$

Life expectancy index

The life expectancy index measures the relative achievement of a country in the number of years that people in a given population can expect to live at birth. It is a summary measure of mortality in a population. Statistics on life expectancy are derived from a mathematical model known as a life table, which creates a hypothetical cohort of 100,000 persons and subjects it to the age/sex specific mortality rates observed in a given population.

The infant mortality rate (IMR) has been computed for estimating life expectancy at birth using 2006 NDHS data in this Report. Both direct and indirect methods were used to calculate this index. Later, this was used to produce a table of the equivalent level of mortality using Coale and Demeny (1966) west mortality model. Several sensitivity analyses were performed to derive a robust mortality estimate.

Life expectancy has been calculated for both rural and urban areas, ecological regions, development regions, eco-development regions, and for caste and ethnic groups. It is based on a stable model technique that uses the distribution of population by age and sex. As none of the single mortality estimation techniques was sufficient to produce consistent indicators at the regional and sub-regional levels, this method has also been applied in generating the crude death rate and the proportion of population at age (x) to calculate the life expectancy at birth.

The task of estimating life expectancy at birth index is very challenging in a country like Nepal because other external means of verification for a derived index are not yet available. Thus, performing the estimate depends on internal consistency checks; in this Report, these have been done by:

1. computing mortality rates using various direct and indirect methods and comparing the values of estimated mortality; and
2. comparing mortality trends over years.

To undertake this kind of validation, data from other sources, such as the NDHS 2001, the National Population Census 2001, and the NFHS 1996 have also been used. This has helped to verify the estimates derived from the NDHS 2006 data for this Report.

Education index

The education index is constructed so as to measure the knowledge component of HDI. It shows a country's relative achievement in both literacy and in enrolment ratios by merging the adult literacy rate (two-thirds weight) and combined primary, secondary and tertiary gross enrolment ratio (one-third weight).

However, in this Report, as in its predecessor, the mean year of schooling has been used as a substitute for gross enrolment ratio because:

1. it captures the quality of education obtained by literate adults and the educational attainment of young people (combined enrolment ratio); this is not possible when the gross enrolment ratio (GER) alone is used;
2. generally, GER is overestimated because it derives from enrolment-based government grants in school;
3. the data on tertiary enrolment is not available; and
4. GER at the primary level in Nepal is significantly greater than 100, implying that both under-age children and these beyond the primary level enrol, especially at primary level. Initially, the global human development report preferred the use of the mean year of schooling; later, however, GER was suggested because of the difficulty of obtaining this type of data.

In the absence of the latest population census and comparable surveys in Nepal today, the Nepal Human Development Report has estimated the adult literacy rate and mean year of schooling from the NDHS 2006 data to compute the education index. Literacy rates and mean years of schooling were calculated for urban- rural areas, ecological zones, development regions, eco-development regions and for caste and ethnic groups.

Gross domestic product

GDP is vital to measuring human development. However, it is not the sole measure of progress (UNDP 1993). The economy of a country simply cannot be explained by the activities of private households, as it consists of collective efforts by government, formal businesses, households, and, last but not least, non-profit Institutions.

The GDP presents income in the form of compensation to all employees, the gross operating surplus to all entrepreneurs including those who are self-employed, and revenue to the government at both the local and central levels in the form of taxes and non-tax duties. The income data derived from household surveys can approximate only the first of these components - compensation to employees and some portion of mixed income at the household level by its working members. The other two components of income generation are not generally recorded through household surveys. Therefore, using GDP per capita rather than per capita income within households is regarded as a better measure of a decent standard of living.

Maximum and minimum values used for calculating HDI

Indicator	Maximum value	Minimum value
Life expectancy at birth	85	25
Adult literacy rate	100	0
Mean years of schooling	15	0
GDP per capita PPP$	40,000	100

Calculation of human development index: an illustration for urban population

Basic data table showing data to calculate HDI:

Region	Life expectancy at birth (years)	Adult literacy rate (% age 15 and above)	Mean years of education	GDP per capita (PPP US$)
Urban Nepal	68.06	72.30	5.19	

Computation of HDI components

Life expectancy index:	$\frac{68.06-25}{85-25}$	=	$\frac{43.06}{60}$	**0.7176**
Adult literacy index:	$\frac{72.30-0}{100-0}$	=	$\frac{72.30}{100}$	**0.7230**
Mean years of schooling index:	$\frac{5.19-0}{15-0}$	=	$\frac{5.19}{15}$	**0.3459**
Educational attainment index:	$[2(0.723)+1(0.346)]/3$			**0.5973**
Adjusted GDP per capita (PPP US$) index:	$\frac{\log(3,149)-\log(100)}{\log(40,000)-\log(100)}$	=	$\frac{1.4981147}{2.60206}$	**0.5757**

HDI output table:

Region	Life expectancy index	Educational attainment index	Income index	Sum of three	Human development index
Urban Nepal	0.7176	0.5973	0.5757	1.8906	0.630

The gender-related development index

While HDI measures average achievement, gender-related development index (GDI) adjusts average achievement to reflect inequalities between men and women in the same dimensions as those of HDI. The GDI thus adjusts the average achievement of each region/sub-region and social groups in all the three dimensions of HDI: a long and healthy life, knowledge, and a decent standard of living.

The calculation of the GDI involves three steps: First, female and male indices in each dimension are calculated. Second, these indices in each dimension are combined so as to reveal differences in achievement between men and women. The resulting index is referred as the equally distributed index. As suggested in the Human Development Report 2006, the report has used a weighted formula that expresses a moderate aversion to inequality, setting the weighting parameter, e, equal to 2 for gender-sensitive adjustment. This is a harmonic mean of male and female value. Finally, in the third step, the GDI is calculated by combining the three equally distributed indices in an unweighted average.

Calculation of gender-related development index: an illustration for urban population

Percentage share of population

Female	0.4836
Male	0.5164

Step one: Computing the equally distributed life expectancy index

Life expectancy

Female	70.18
Male	66.19

Life expectancy index

Female	(70.18 – 27.5)/60 = 0.711
Male	(66.19 – 22.5)/60 = 0.728

Equally distributed life expectancy index

[Female population share X (female life expectancy index)$^{-1}$ + Male population share X (male life expectancy index $^{-1}$]$^{-1}$

$$[[0.4836 * (0.711)^{-1}] + [0.5164 * (0.728)^{-1}]]^{-1} = \mathbf{0.7197}$$

Step two: Computing the equally distributed educational attainment index

Adult literacy rate (percentage age 15 and above)

Female	61.23
Male	83.36

Mean years of schooling

Female	4.345
Male	6.033

Adult literacy index

Female	(61.23 – 0)/100 = 0.612
Male	(83.36 – 0)/100 = 0.834

Mean year of schooling index

Female	(4.345 – 0)/15 = 0.290
Male	(6.033 – 0)/15 = 0.402

Educational attainment index

Female	[2/3(0.612) + (1/3(0.290)] = 0.505
Male	[2/3(0.834) + (1/3(0.402)] = 0.690

Equally distributed educational attainment index

[Female population share X (female educational attainment index)$^{-1}$ + Male population share X (male educational attainment index $^{-1}$]$^{-1}$

$$[[0.4836 * (0.505)^{-1}] + [0.5164 * (0.690)^{-1}]]^{-1} = \mathbf{0.5849}$$

Step three: Computing the equally distributed income index

GDP per capita

Female	1,786
Male	4,425

Adjusted GDP per capita (PPP US$) index

Female

$$\frac{\log(1{,}786) - \log(100)}{\log(40{,}000) - \log(100)} = 0.4811$$

Male

$$\frac{\log(4{,}425) - \log(100)}{\log(40{,}000) - \log(100)} = 0.6325$$

Equally distributed income index

[Female population share X (female income index)$^{-1}$ + Male population share X (male income index $^{-1}$]$^{-1}$

$$[[0.4836 * (0.481)^{-1}] + [0.5164 * (0.632)^{-1}]]^{-1} = \mathbf{0.5490}$$

Step four: Computing gender-related development index

Region	Equally distributed life expectancy index	Equally distributed educational attainment index	Equally distributed income index	Sum of three	Gender-related development index
Urban	**0.720**	**0.585**	**0.549**	**1.854**	**0.618**

The GDI uses different maximum and minimum values for female and male for the four indicators. For example, for the life expectancy of women, the maximum value is 87.5 years and the minimum 27.5 years; for men the corresponding values are 82.5 and 22.5 years, respectively (UNDP 2006). Similarly, the calculation of GDI requires separate per capita income in PPP$ for both sexes. The procedure therefore begins with disaggregating per capita income by sex, using the standard set of formulae used in human development reports.

The minimum and the maximum values for the variables used in calculating GDI for Nepal and the formula used for calculating the GDI at each of the three steps mentioned above are given in the corresponding box that illustrates the computation of GDI.

The gender empowerment measure

The gender empowerment measure (GEM) uses variables constructed explicitly to measure relative empowerment of women and men in political and economic spheres of activity. This index focuses on women's opportunities rather than their capabilities and captures inequality in following three key areas:

- *Political participation and decision-making power* is measured by women's and men's percentage share in parliamentary seats. The participation of men and women only in local election at Village Development Committee (VDC) and municipality level is used to reflect the political participation and decision-making power.
- *Economic participation and decision-making* is measured by percentage share of men and women in administrative and managerial positions, and in professional and technical positions.
- *Power over economic resources* is measured by women's and men's estimated earned income (PPP US$). It is calculated in the same way as GDI, except that the unadjusted rather than adjusted GDP per capita is used.

The three indices—political participation and decision-making, economic participation and decision-making, and power over economic resources—are averaged to derive the final GEM value (UNDP 2006). For all variables, Equally Distributed Equivalent Percentage (EDEP), as used in the calculation of GDI, has been calculated assuming a value of 2 for 'aversion to inequality'. The calculation process of equally distributed income index for GEM is similar to that of GDI. The only difference is in the formula for calculating separate income per capita indices for both sexes.

Calculation of gender empower measure an illustration for urban population

Percentage share of population

Female	0.4836
Male	0.5164

Step one: Calculating indices for parliamentary representation, administrative and managerial, and professional and technical positions.

Percentage share of parliamentary representation

Female	18.10
Male	81.90

Percentage share of administrative and managerial position

Female	34.01
Male	65.99

Percentage share of professional and technical position

Female	34.97
Male	65.03

Equally distributed equivalent percentage (EDEP) for parliamentary representation

[Female population share X (female's share in parliamentary representation)$^{-1}$ +
Male population share X (male's share in parliamentary representation $^{-1}$]$^{-1}$
[[0.4836 * (18.10) $^{-1}$] + [0.5164 * (81.19) $^{-1}$]]$^{-1}$ = 30.28

Equally distributed equivalent percentage (EDEP) for administrative and managerial positions

[Female population share X (female's share in administrative and managerial positions)$^{-1}$ +
Male population share X (male's share in administrative and managerial positions $^{-1}$]$^{-1}$
[[0. 4836 * (34.01) $^{-1}$] + [0. 5164* (65.99) $^{-1}$]]$^{-1}$ = 45.36

Equally distributed equivalent percentage (EDEP) for professional and technical positions

[Female population share X (female's share in professional and technical positions)$^{-1}$ +
Male population share X (male's share in professional and technical positions $^{-1}$]$^{-1}$
[[0. 4836 * (34.97) $^{-1}$] + [0. 5164 * (65.03) $^{-1}$]]$^{-1}$ = 45.93

Indexing parliamentary representation: 30.28/50 = 0.606

Indexing administrative and managerial positions: 45.36/50 = 0.907

Indexing professional and technical positions: 45.93/50 = 0.919

Combining the indices for administrative and managerial, and professional and technical, positions

(Index of administrative and managerial positions + Index of professional and technical positions)/2 =(0.907 + 0.919)/2 = 0. 9129

Step two: Calculating index for male and female income

$$S_f = \frac{W_f / W_m \times ea_f}{W_f / W_m \times ea_f + ea_m} \quad 3A$$

$$Y_f = \frac{S_f Y}{N_f} \quad 3B$$

$$Y_m = (1 - S_f) Y / N_m \quad 3C$$

$$W(Y_f) = \frac{Y_f - 100}{40{,}000 - 100} \quad 3D$$

$$W(Y_m) = \frac{Y_m - 100}{40{,}000 - 100} \quad 3E$$

Equally distributed income index for GEM: $I_{GEM} = \{P_f W(Y_f)^{-1} + P_m W(Y_m)^{-1}\}^{-1}$ ***(4)***

Where the symbols have their usual meanings, for example in urban Y_f ***= 1786 $ ***Y_m*** ***= 4425 $***

$W(Y_f) = (1786 - 100) / (40000 - 100) = 0.042256$

$W(Y_m) = (4425 - 100) / (40000 - 100) = 0.108396$

Equally distributed income index: $[[0.4836 * (0.042256)^{-1}] + [0.5164 * (0.108396)^{-1}]]^{-1} = 0.0616$

Step three: Computing GEM index

GEM=1/3 (index of parliamentary representation + combined index of administrative, managerial, professional and technical positions + equally distributed income index)

GEM urban = 1/3 (0.606 + 0. 9129 + 0.0616) = 0.527

Human poverty index

The human poverty index (HPI), a multi-dimensional measure of poverty introduced in the Human Development Report 1997 (UNDP 1997), is a reverse image of HDI that focuses on human deprivation instead of human achievement. While HDI measures average achievement, the HPI-1 designed for developing countries measures deprivation in the three basic dimensions of human development included in the HDI and therefore brings together in one composite index the deprivation in each of the three basic dimensions of human life-a long and healthy life, knowledge, and a decent standard of living.

Deprivation in three basic dimensions is measured as follows: Deprivation in a long and healthy life (P_1) is measured by the percentage of people born alive today who are not expected to survive to age 40; deprivation in knowledge/exclusion (P_2) is measured by the adult illiteracy rate; and deprivation in economic provisioning/decent standard of living (P_3) is measured jointly by the unweighted composite value of two indicators: (i) the percentage of population without sustainable access to safe drinking water (P_{31}), and (ii) the percentage of children under five who are underweight for their age (P_{32}), that is, $P_3 = [P_{31} + P_{32}]/2$. The HPI is calculated as outlined in HDR 2006 with the assumption of a generalized mean a = 3.

Calculation of human poverty index an illustration for urban population

Region	Percentage of people not expected to survive to age 40 Deprivation in longevity (%)	Adult illiteracy rate Deprivation in knowledge (%)	Percentage of people without access to safe water	Percentage of under weight children under age 5	$((P_{31}) + (P_{32}))/2$ Deprivation in economic provisioning
	(P_1)	(P_2)	(P_{31})	(P_{32})	(P_3)
HPI urban	9.1	27.7	10.01	23.0	16.0

$HPI = [1/3\{P_1^3 + P_2^3 + P_3^3\}]^{1/3}$

$HPI\ urban = [1/3\{(9.1)^3 + (27.7)^3 + (16.0)^3\}]^{1/3} = 20.57$

ANNEX 2.3 *Values of human development index and other related indices*

TABLE 1 Human development index, Nepal, 2006

Region	Human development index 2006	Life expectancy at birth 2006	Adult literacy (% age 15 years and above) 2006	Mean years of schooling 2006	GDP per capita (PPP US$) 2006	Life expectancy index 2006	Educational attainment index 2006	GDP index 2006+	Ratio to national HDI
Nepal	**0.509**	**63.69**	**52.42**	**3.21**	**1597**	**0.645**	**0.421**	**0.4624**	**100.0**
Urban	0.630	68.06	72.30	5.19	3149	0.718	0.597	0.5757	123.7
Rural	0.482	63.09	48.35	2.84	1286	0.635	0.386	0.4263	94.7
Eastern region	0.526	66.16	53.95	3.21	1570	0.686	0.431	0.4596	103.2
Central region	0.531	65.69	51.53	3.26	1989	0.678	0.416	0.4991	104.3
Western region	0.516	64.12	55.65	3.43	1477	0.652	0.447	0.4494	101.3
Mid-Western region	0.452	57.21	50.78	3.07	1192	0.537	0.407	0.4136	88.8
Far-Western region	0.461	61.33	48.70	2.91	1023	0.605	0.389	0.3881	90.5
Mountain	0.436	57.91	44.67	2.44	1158	0.548	0.352	0.4088	85.7
Hill	0.543	66.48	57.60	3.68	1683	0.691	0.466	0.4712	106.6
Tarai	0.494	62.76	49.02	2.92	1584	0.629	0.392	0.4610	97.0
Eastern Mountain	0.519	65.42	55.29	3.06	1441	0.674	0.437	0.4453	101.8
Central Mountain	0.454	62.94	40.51	2.33	1161	0.632	0.322	0.4092	89.2
Western Mountain	0.435	51.79	41.89	2.18	2401	0.447	0.328	0.5305	85.4
Eastern Hill	0.543	69.33	57.16	3.42	1344	0.739	0.457	0.4336	106.6
Central Hill	0.602	71.27	61.10	4.18	2461	0.771	0.500	0.5346	118.2
Western Hill	0.549	69.10	58.25	3.71	1415	0.735	0.471	0.4422	107.8
Mid-Western Hill	0.448	56.74	52.36	3.17	1073	0.529	0.419	0.3961	88.0
Far-Western Hill	0.443	61.08	45.34	2.55	905	0.601	0.359	0.3676	86.9
Eastern Tarai	0.519	64.87	52.46	3.14	1696	0.664	0.420	0.4725	101.9
Central Tarai	0.478	62.75	42.19	2.43	1676	0.629	0.335	0.4705	93.9
Western Tarai	0.468	56.90	51.86	3.05	1561	0.532	0.413	0.4586	91.9
Mid-Western Tarai	0.481	60.78	50.71	3.14	1387	0.596	0.408	0.4389	94.4
Far-Western Tarai	0.503	66.11	51.96	3.22	1143	0.685	0.418	0.4066	98.8

+ : derived using the information from the National account. The life expectancy in 2006 in Tarai as compared to earlier Nepal HDR 2004 has slightly decreased. The earlier life-expectancy value was based on the 2001 Census data, while the current one is based on the NDHS 2006 data. Note that there was a coverage problem in the 2001 census data.

Source: NDHS 2006 and NLSS 2003/04.

TABLE 2 Gender-related development index, Nepal, 2006

Region	Gender-related development index	Life expectancy 2006		Adult literacy (%) 2006		Mean years of schooling 2006		Estimated earned income+ 2006		Relative value 2006	
		Female	Male	Female	Male	Female	Male	Female	Male	Nepal=100	GDI/HDI
Nepal	**0.499**	**65.71**	**61.92**	**38.44**	**69.67**	**2.468**	**4.080**	**0.408**	**0.503**	**100**	**0.979**
Urban	0.618	70.18	66.19	61.23	83.36	4.345	6.033	0.481	0.633	124	0.981
Rural	0.471	65.09	61.32	34.30	66.47	2.149	3.682	0.377	0.464	95	0.978
Eastern region	0.516	68.24	64.33	41.42	69.09	2.584	3.937	0.399	0.504	103	0.982
Central region	0.517	67.75	63.87	36.57	68.74	2.415	4.195	0.428	0.547	104	0.973
Western region	0.511	66.14	62.33	44.86	70.21	2.832	4.177	0.407	0.485	102	0.990
Mid-Western region	0.441	59.04	55.59	35.28	70.57	2.338	3.959	0.376	0.444	89	0.976
Far-Western region	0.447	63.28	59.60	31.15	71.80	2.000	3.992	0.370	0.405	90	0.971
Mountain	0.423	59.76	56.26	29.08	64.22	1.703	3.347	0.369	0.441	85	0.969
Hill	0.534	68.57	64.65	44.52	73.71	2.933	4.578	0.417	0.513	107	0.983
Tarai	0.482	64.76	61.00	34.51	66.93	2.176	3.768	0.402	0.503	97	0.976
Eastern Mountain	0.514	67.48	63.61	46.15	67.53	2.774	3.434	0.392	0.486	103	0.992
Central Mountain	0.441	64.94	61.17	26.85	56.80	1.728	3.061	0.352	0.452	88	0.969
Western Mountain	0.414	53.95	50.35	21.56	67.42	1.143	3.481	0.490	0.560	83	0.951
Eastern Hill	0.534	71.43	67.49	44.69	71.62	2.822	4.095	0.376	0.477	107	0.983
Central Hill	0.589	73.33	69.46	47.03	76.19	3.267	5.172	0.458	0.585	118	0.978
Western Hill	0.547	71.20	67.26	49.78	70.60	3.175	4.407	0.406	0.475	110	0.995
Mid-Western Hill	0.439	58.55	55.14	36.66	73.06	2.485	4.055	0.378	0.413	88	0.980
Far-Western Hill	0.421	63.03	59.36	24.62	75.08	1.547	3.851	0.369	0.366	84	0.952
Eastern Tarai	0.508	66.92	63.07	39.53	68.18	2.457	3.926	0.407	0.518	102	0.980
Central Tarai	0.463	64.74	60.99	26.80	61.29	1.658	3.308	0.408	0.514	93	0.968
Western Tarai	0.455	58.72	55.30	36.73	69.99	2.287	3.894	0.401	0.501	91	0.973
Mid-Western Tarai	0.477	62.72	60.99	38.73	66.23	2.533	3.851	0.374	0.485	96	0.991
Far-Western Tarai	0.492	68.19	64.28	35.63	72.46	2.374	4.187	0.375	0.432	99	0.978

+: derived using the information from the National account.
Source: NDHS 2006 and NLSS 2003/04.

TABLE 3 Gender empowerment measure, Nepal, 2006

Region	Gender empowerment measure 2006	Women participation in local election (%)*	Women in professional jobs 2006**	Women in administrative jobs 2006**	Ratio of estimated female to male earned income 2006**
Nepal	**0.496**	**19.33**	**29.78**	**28.95**	**0.375**
Urban	0.527	18.10	34.97	34.01	0.386
Rural	0.474	19.40	26.56	25.66	0.313
Eastern region	0.516	19.20	31.29	36.58	0.365
Central region	0.511	19.00	35.13	28.48	0.339
Western region	0.488	20.30	24.29	31.88	0.407
Mid-Western region	0.431	19.20	16.19	25.33	0.412
Far-Western region	0.456	18.60	40.59	15.41	0.451
Mountain	0.468	19.80	21.89	28.08	0.402
Hill	0.515	19.90	34.52	31.23	0.376
Tarai	0.469	18.60	23.95	26.60	0.368
Eastern Mountain	0.538	19.50	37.78	43.15	0.373
Central Mountain	0.489	19.90	21.46	37.78	0.358
Western Mountain	0.413	28.70	7.06	11.05	0.394
Eastern Hill	0.529	19.70	45.50	32.30	0.368
Central Hill	0.534	19.60	39.01	31.88	0.326
Western Hill	0.518	21.10	31.29	35.90	0.429
Mid-Western Hill	0.410	19.30	10.70	27.67	0.469
Far-Western Hill	0.396	18.40	37.78	5.72	0.476
Eastern Tarai	0.483	18.80	20.81	37.01	0.361
Central Tarai	0.467	18.30	28.23	21.72	0.362
Western Tarai	0.391	18.40	7.87	26.39	0.364
Mid-Western Tarai	0.488	19.00	29.07	27.87	0.354
Far-Western Tarai	0.469	18.70	43.15	16.48	0.421

* This information is taken from the 1997 local election data as this is the only information we have on women's participation in the local election. However, the GEM has been updated using the women participation in CA 2008 (See Table 2.3 in Chapter Two of the Report).

** Estimated using NDHS 2006.

Source: NDHS 2006 and NLSS 2003/04.

TABLE 4 Human poverty index , Nepal, 2006

Region	Human poverty index 2006	Under weight children under 5-years of age 2006	Adult illiteracy rate 2006	Proportion of populating with life expectancy < 40 years 2006	Percent of population without access to safe drinking water 2006	Relative value Nepal=100
All Nepal	35.4	38.5	47.6	14.3	17.55	100.00
Urban	20.7	23.0	27.7	9.1	10.01	58.45
Rural	38.2	40.7	51.6	15.0	18.90	108.09
Eastern region	33.7	32.5	46.1	11.4	17.72	95.34
Central region	35.3	38.5	48.5	11.9	12.33	99.83
Western region	33.2	38.5	44.3	13.8	15.91	93.94
Mid-Western region	38.7	43.5	49.2	22.4	27.00	109.53
Far-Western region	39.0	43.1	51.3	17.2	24.23	110.35
Mountain	43.3	40.9	55.3	21.5	39.01	122.40
Hill	32.7	33.0	42.4	11.0	27.14	92.41
Tarai	36.9	42.6	51.0	15.4	6.15	104.33
Eastern Mountain	37.6	35.3	44.7	12.2	46.26	106.23
Central Mountain	42.2	29.6	59.5	15.2	15.25	119.31
Western Mountain	48.1	47.1	58.1	29.7	48.90	135.90
Eastern Hill	34.3	32.1	42.8	8.0	37.13	96.88
Central Hill	28.2	22.3	38.9	6.1	17.91	79.72
Western Hill	31.8	34.2	41.8	8.2	22.57	89.85
Mid-Western Hill	40.0	46.0	47.6	23.0	36.81	112.98
Far-Western Hill	44.9	43.4	54.7	17.5	50.33	126.99
Eastern Tarai	33.8	32.3	47.5	12.9	5.47	95.71
Central Tarai	41.9	50.7	57.8	15.4	6.53	118.42
Western Tarai	36.0	45.0	48.1	22.8	6.05	101.82
Mid-Western Tarai	36.8	37.9	49.3	17.9	19.57	103.98
Far-Western Tarai	35.3	41.6	48.0	11.4	12.47+	99.88

+ Since NDHS 2006 did not provide this information, we used the same data used in the 2004 Nepal human development report.

Source: NDHS 2006 and NLSS 2003/04.

ANNEX 2.4 *Human development by major caste and ethnicity*

Human development index of major caste and ethnic groups

Caste and ethnicity are the basic elements of the social mosaic of Nepal. In the recent years, the demand for data and indices by caste and ethnicity has risen because of the increase in identity politics, along with the need for disaggregated planning. The 2001 Census has listed 103 groups but only 101 groups are specified; and the two groups which are not specified are: (i) Dalit - unidentified, and (ii) Caste/ethnicity – unidentified. The Nepal Living Standards Survey (NLSS) 2003/04 found 80, while the Nepal Demographic and Health Survey (NDHS) 2006 enumerated only 75 groups in their surveys, respectively.

As indicated earlier, the NDHS 2006 and the NLSS 2003/04 are the two main sources of data available for computing the HDI of caste and ethnic groups in Nepal. The NDHS 2006 provided the information on demographic and health aspects while NLSS 2003/04 provided information on the economic dimension. Despite demands for HDI estimates for all the caste and ethnic groups separately, the national household surveys rule these out because of their limited sample size. The actual sample size of the NDHS 200a6 was 8,707 households and for the NLSS 2003/04, 5,072 households. Moreover, they do not capture all the caste and ethnic groups in their sample surveys. To ensure the minimum number required to estimate HDI by caste ethnicity in Nepal, all the 75 caste and ethnic groups found in the NDHS 2006 are grouped into seven main caste/ethnic groups and 11 caste/ethnic groups with regional divisions, as suggested by Bennett and Dahal (2008). This is presented in Table 1. However, apart from the 11 groups broken down by region, estimates have also been made for the following additional 9 groups: (1) all Brahman, (2) all Dalits, (3) all Janajati, (4) all Hill Mountain groups with Newar, (5) all Hill Mountain groups without Newar, (6) all Tarai/Madhesi groups with Muslim, (7) all Tarai/Madhesi groups without Muslim, (8) all Janajati including Newar, and (9) all Hill Janajati including Newar. Altogether, then, HDI has been estimated for 20 groups and is presented in Table 3. The number of cases used for the estimate is given in Table 4.

Limitations

The HDI value calculated for caste and ethnic groups in this Report has some limitations that should be considered before drawing any firm conclusion. First, the HDI value is calculated by amalgamating the 75 caste and ethnic groups into 20. Second, the data used in this study represent geographic regions rather than caste and ethnicity. Therefore the estimates are robust only for the geographic region for which the sample was designed. Third, because of the pooling of data from the NLSS and NDHS, the number of samplings has been reduced further.

TABLE 1 Caste and ethnicity classified by major groups

7 Major groups	11 Caste/ethnic sub-groups	All caste and ethnic groups
1. Brahman/Chhetri	1.1 Hill Brahman	1.1 Hill Brahman
	1.2 Hill Chhetri	1.2 Chhetri, Thakuri, Sanyasi
	1.3 Tarai/Madhesi Brahman/Chhetri	1.3 Madhesi Brahman, Nurang, Rajput, Kayastha
2. Tarai/Madhesi other castes	2.1 Tarai/Madhesi other castes	2.1 Kewat, Mallah, Lohar, Nuniya, Kahar, Lodha, Rajbhar, Bing, Malli, Kamar, Dhuniya, Yadav, Teli, Koiri, Kurmi, Sonar, Baniya, Kalwar, Thakur/Hazam, Kanu, Sudhi , Kumhar, Haluwai, Badhai, Barai, Bhediyar/Gaderi,
3. Dalits	3.1 Hill Dalits	3.1 Kami, Damai/Dholi, Sarki, Badi, Gaine, unidentified Dalits
	3.2 Tarai/Madhesi Dalits	3.2 Chamar/Harijan, Musahar, Dushad/Paswan, Tatma, Khatwe, Dhobi, Baantar, Chidimar, Dom, Halkhor
4. Newar	4. Newar	4. Newar
5. Janajati	5.1 Hill Janajati	5.1 Tamang, Kumal, Sunuwar, Majhi, Danuwar,Thami/Thangmi, Darai, Bote, Baramu/Bramhu, Pahari, Kusunda, Raji, Raute, Chepang/ Praja, Hayu, Magar, Chhantal, Bankarya, Rai, Sherpa, Bhujel/ Gharti, Yakha, Thakali, Limbu, Lepcha, Bhote, Byansi, Jirel, Hyalmo, Walung, Gurung, Dura
	5.2 Tarai/Madhesi Janajati	5.2 Tharu, Jhangad, Dhanuk, Rajbanshi, Gangai, Santhal/Satar, Dhimal, Tajpuriya, Meche, Koche, Kisan, Munda, Kusbadiya/ Patharkata, unidentified Adibasi Janajati
6. Muslim	6. Muslim	6. Madhesi Muslim, Churoute (Hill Muslim)
7. Other	7. Other	7. Marwari, Bangali, Jain, Punjabi/ Sikh, unidentified others

8.1 All Hill and Mountain groups with Newar
8.2 All Hill and Mountain groups without Newar
8.3 All Tarai/Madhesi groups with Muslim
8.4 All Tarai/Madhesi groups without Muslim
8.5 All Janajati including Newar
8.6 All Hill Janajati including Newar

Note: The categorization is the same as that of Bennett and Dahal 2008.

Caste and ethnic groups and human development

Of the seven main caste and ethnic groups, the HDI of all Brahman and Chhetri ranks third (0.552) after the Newar (0.616) and other caste and ethnic groups (0.559). The HDI of Janajati falls somewhere in between (0.494). The lowest value is that of Muslim (0.401), followed by all Dalits (0.424). However, across these seven castes and ethnic groups, wide variation emerges when they are disaggregated by region. Of the 11 groups viewed regionally, the Tarai Madhesi Brahman and Chhetri have the highest level of HDI, followed by the Newar, most of whom live in urban areas. By contrast, the Tarai/Madhesi Dalits have the lowest level of human development (0.383), followed by Muslim (0.401) and all Dalits (0.424). However, because of the small number of samplings, this estimate may not be robust.

Table 2 presents the caste/ethnic groups in four categories ranked in terms of their HDI value, which shows that the Brahman and Chhetri and the Newar have the highest HDI irrespective of geographic region. At the other extreme lie the Tarai Madhesi Dalits.

Among the three components of HDI, life expectancy has the greatest contribution among all caste/ethnic groups except the Tarai/Madhesi Brahman/Chhetri group, where education becomes a great factor. GDP per capita falls below the other two components despite the fact that there is higher variation in household income as measured by household surveys such as the NLSS. This may indicate one of the limitations of using per capita GDP as a HDI measure; it also suggests that unless the state provides more services to the poor as well as the excluded, GDP per capita may have to be adjusted by household income data for a more accurate estimate.

Educational attainment varies widely. It is higher for Brahman/Chhetri and Newar than for the other caste and ethnic groups. This implies that the HDI of Dalits and Muslim can be improved by investing more in education. However, the lower value of the GDP per capita among most of the caste and ethnic groups also suggests that a high and inclusive GDP growth can play the larger role in human development.

TABLE 2 HDI value of caste and ethnic groups by four broad categories

Caste/ethnicity	HDI value
Hill Brahman Tarai/Madhesi/Brahman/Chhetri Newar	0.612 - 0.625
All Brahman/Chhetri Hill Chhetri Hill/Mountain Janajati All Janajati including Newar All Hill Janajati including Newar All Hill Mountain groups with Newar All Hill Mountain groups without Newar Other	0.507 - 0.559
Tarai/Madhesi other caste All Dalits Hill Dalits All Janajati Tarai Janajati Muslim All Tarai/Madhesi groups with Muslim All Tarai/Madhesi groups without Muslim	0.401 - 0.494
Tarai/Madhesi Dalits	0.383

TABLE 3 Human development by caste and ethnicity with regional divisions, Nepal, 2006

Country/ caste-ethnicity	Life expectancy at birth	Adult literacy	Mean years of schooling	Per capita income PPP income in US$	Life expectancy index	Educational attainment	Income index	Human development index	Ratio to National HDI	Rank
All Nepal	**63.69**	**52.42**	**3.21**	**1597**	**0.645**	**0.421**	**0.4624**	**0.509**	**100.0**	
Caste ethnicity										
All Brahman/Chhetri	**62.95**	**63.65**	**4.40**	**2027**	**0.633**	**0.522**	**0.5022**	**0.552**	**108.4**	**5**
Hill Brahman	68.10	69.93	5.40	2395	0.718	0.586	0.5301	0.612	120.1	3
Hill Chhetri	60.61	58.40	3.69	1736	0.594	0.471	0.4763	0.514	100.8	9
Tarai/Madhesi/Brahman/Chhetri	63.89	83.80	6.40	2333	0.648	0.701	0.5257	0.625	122.7	1
Tarai/Madhesi/other caste	**61.94**	**41.85**	**2.30**	**1119**	**0.616**	**0.330**	**0.4031**	**0.450**	**88.3**	**15**
All Dalits	**61.03**	**38.02**	**1.73**	**977**	**0.601**	**0.292**	**0.3804**	**0.424**	**83.3**	**18**
Hill Dalits	60.89	45.50	2.07	1099	0.598	0.349	0.4001	0.449	88.2	16
Tarai/Madhesi/Dalits	61.26	27.32	1.21	743	0.604	0.209	0.3348	0.383	75.1	20
Newar	**68.00**	**68.20**	**4.66**	**3097**	**0.717**	**0.558**	**0.5730**	**0.616**	**120.9**	**2**
All Janajati excluding Newar	**62.91**	**51.67**	**2.96**	**1405**	**0.632**	**0.410**	**0.4410**	**0.494**	**97.1**	**12**
Hill/Mountain/Janajati	63.61	53.81	3.05	1490	0.644	0.427	0.4509	0.507	99.5	11
Tarai Janajati	61.55	48.11	2.81	1224	0.609	0.383	0.4180	0.470	92.3	13
Muslim	**60.99**	**30.32**	**1.60**	**890**	**0.600**	**0.238**	**0.3648**	**0.401**	**78.7**	**19**
All Janajati including Newar	63.33	53.52	3.14	1697	0.639	0.427	0.4726	0.513	100.7	10
All Hill Janajati including Newar	64.15	56.23	3.31	1869	0.652	0.448	0.4887	0.530	104.0	7
All Hill/Mountain groups with Newar	63.12	58.47	3.67	1846	0.635	0.471	0.4866	0.531	104.3	6
All Hill/Mountain groups without Newar	62.86	57.75	3.60	1699	0.631	0.465	0.4728	0.523	102.7	8
All Tarai/Madhesi groups with Muslim	61.59	42.34	2.37	1094	0.610	0.335	0.3993	0.448	88.0	17
All Tarai/Madhesi groups without Muslim	61.69	43.74	2.47	1143	0.612	0.346	0.4066	0.455	89.3	14
Others	66.35	57.97	3.70	2227	0.689	0.469	0.5180	0.559	109.7	4

Source: NDHS 2006 and NLSS 2003/04.

TABLE 4 Number of cases/observations used to calculate the mean years of schooling, adult literacy and income for the 11 caste and ethnic groups with regional divisions

Caste and ethnic group	Population under 15 years of age	Population aged 15 and over	Number of households
Hill Brahman	3,849	2,877	551
Hill Chhetri	6,166	4,267	733
Tarai/Madhesi Brahman/Chhetri	282	216	37
Tarai/Madhesi other castes	3,629	2,459	360
Hill Dalits	2,282	1,488	312
Tarai/Madhesi Dalits	1,509	1,036	128
Newar	1,366	1,003	379
Hill Janajati	7,172	4,960	907
Tarai/Madhesi Janajati	4,228	2,985	270
Muslim	1,198	785	165
Others	708	521	31
Total	**32,388**	**22,597**	**3,873**

Source: NDHS 2006 and NLSS 2003/04.

TABLE 5 Number of cases/observations used to calculate the mean years of schooling, adult literacy and income for the 20 caste and ethnic groups with social and regional divisions

Caste group	Population aged under 15 years of age	Population aged 15 and over	Number of household
All Brahman/Chhetri	**10,297**	**7,360**	**1,321**
Hill Brahman	3,849	2,877	551
Hill Chhetri	6,166	4,267	733
Tarai/Madhesi Brahman/Chhetri	282	216	37
Other Tarai/Madhesi	**3,629**	**2,459**	**360**
All Dalits	**3,791**	**2,525**	**440**
Hill Dalits	2,282	1,488	312
Tarai Dalits	1,509	1,036	128
Newar	**1,366**	**1,003**	**379**
All Janajati excluding Newar	**11,399**	**7,945**	**1,177**
Hill Janajati	7,172	4,960	907
Tarai Janajati	4,228	2,985	270
Muslim	1,198	785	165
All Janajati including Newar	9,647	8,948	1,556
All Hill Janajati including Newar	8,538	5,963	1,286
All Hill/Mountain groups with Newar	20,835	14,595	2,882
All Hill/Mountain groups without Newar	12,765	13,593	2,503
All Tarai/Madhesi groups with Muslim	10,846	7,480	960
All Tarai/Madhesi groups without Muslim	19,469	6,696	795
Others	708	521	31

Source: NDHS 2006 and NLSS 2003/04.