Introduction

Background and Objectives

In 1997, the International Centre for Integrated Mountain Development (ICIMOD) carried out an assessment of the development status of Nepal's districts in collaboration with SNV-Nepal to aid the selection of priority districts for development assistance. The results were published as 'Districts of Nepal – Indicators of Development'. Recently, ICIMOD collaborated with the Central Bureau of Statistics (CBS) in the publication of 'Nepal Census Indicators and Trends in Maps - 2001' to present census data and trends in map form using a geographical information system (GIS) platform. In this context, it was felt timely to revisit the indicators used in the 1997 study, and examine changes in the development status of Nepal's 75 districts revealed by the data gathered during the Population Census 2001, among others. The Netherlands Development Organisation (SNV-Nepal) generously provided a part of the support needed to undertake the study and publish the results, which are summarised in the present document.

Where possible, the present study used the same indicators as in the previous study and followed the same methodology for deriving the status of districts so that the two studies would be comparable. Following the earlier approach, the indicators were divided into three main groups: (i) poverty and deprivation, (ii) socioeconomic and infrastructural development, and (iii) women's empowerment. The section on 'natural resource endowment and management' could not be updated as the new data for these indicators have not yet been released. Similarly, no new data were available for some of the other indicators used previously, and these were dropped from the present study. Differences in the definition and/or use of indicators is described in the relevant sections. In order to increase the comparability with the earlier study, a new composite index was calculated for the 1997 study which excluded the indicators for natural resources endowment and management, as these are not included in the present index. All the indicators in the present study were calculated from data collected between 2000 and 2003, in particular data from the 2001 Population Census.

It is hoped that by presenting the relative levels of development of districts in a visual form, the results will be more easily comprehensible and accessible, and that the maps will be useful for policy makers, development planners, donor agencies, and other stakeholders interested in the development of Nepal.

Indicators, Sources, and Methodology

The present study used 29 indicators divided into three main groups to develop composite indices of development. The indicators, their definitions, and source information are listed in Table 1. The 1997 study used 39 indicators, 32 of which fell within the same three groups; the remainder related to the area of 'natural resource endowment and management' which is not included here. The 29 indicators employed in this study capture various dimensions of socioeconomic conditions and the level of development, including major constraints to development in each district, and portray the current scenarios for poverty and deprivation; socioeconomic and infrastructural development; and women's empowerment.

Poverty and Deprivation

As in the earlier study, eight indicators were selected to measure aspects of poverty and deprivation: three to measure child deprivation, two to measure gender discrimination, one to measure the concentration of disadvantaged groups, one to measure marginal farm households, and one to measure food production.

Child Deprivation – the three basic indicators used to measure child deprivation were child illiteracy rate, child economic activity rate, and child marriage. Of the 2.98 million children aged 10-14 years enumerated in the 2001 census, 21.4% were reported to be illiterate, 20.0% to be usually economically active, and 1.3% to be married. These three groups of children are not mutually exclusive, but they reveal the magnitude of these three basic children's issues.

Gender Discrimination – The two indicators used to measure gender discrimination were adult gender imbalance ratio in literacy status, and adult gender imbalance ratio in non-agricultural occupations.

Disadvantaged Groups – In the 1997 study, an indicator was used to measure the residential concentration of 15 ethnic groups (Musahar, Dhusadh, Chamar, Mallah, Muslim, Kewat, Dhanuk, Sarki, Kurmi, Kami, Yadav, Tharu, Tamang, Damai, and Kushwha) who had been found to be educationally disadvantaged in an analysis of the 1991 census data. In the present study, educationally disadvantaged groups in a particular district were assumed to be those caste/ethnic groups among the 103 in Nepal, whose literacy rates were below or equal to 30% in that district. In 2001, the educationally disadvantaged groups defined in this way accounted for 2.71 million individuals which is 11.92% of the (enumerated) national population.

Marginal Farm Households – Marginal farm households are taken as those households with operational agricultural landholdings (worked by the farm household as owner or tenant) of 0.5 ha or less. The data on the area of agricultural landholdings from the 2001/02 agriculture census had not been released at the time this report was compiled, thus the unpublished data on agricultural landholdings from the 2001 population census were used provisionally to compute the indicator. An indicator based on marginal farm households was used to measure the concentration of marginal farm households in each district.

Food Production – The major food production in each district was converted into kilocalories per capita per day and used as an indicator of the availability of food. Major food production was taken as the total production of rice, maize, wheat, millet, barley, and potatoes.

Socioeconomic and Infrastructural Development

Seventeen indicators were used to show aspects of socioeconomic and infrastructural development: nine were social and health related, and eight were for infrastructure. Two of the 18 indicators used in the previous study – infant mortality rate and cropping intensity – were not available for the present study; toilet facilities were added as a new social- and health-related indicator.

In the previous study, per capita regular and development budget allocations were used as indicators of infrastructure development. In the present study, per capita regular and development budget expenditures were used since they provide a more realistic picture.

Women's Empowerment

Four indicators were used to capture aspects of women's empowerment in terms of their participation in economic activity and education. No new data was available to update two of the indicators used in the earlier study – percentage share of elected females at district level, and percentage share of girl dropouts at primary level. The variables on gender discrimination were moved to the poverty and deprivation category.

Table 1: List of indicators, definitions, and data sources, and indices they contribute to

Index	Indicator	Definition	Source (Data Year)	Comparison with 1997	Remarks
POVDEPI	***Poverty and Deprivation***				
CDI	Child Deprivation				
	5CILR	*Child Illiteracy Rate:* Illiterate children aged 10-14 years as a percentage of total children in the same age group	PC [2001]	Same	Status of child illiteracy
	CLABR	*Child Economic Activity Rate:* Usually economically active children aged 10-14 years as a percentage of total children in the same age group	PC [2001]	Same	Status of child labour
	CMMAR	*Proportion of Child Marriage:* Married children aged 10-14 years as a percentage of total children in the same age group	PC [2001]	Same	Status of child marriage
GDI	Gender Discrimination				
	GIRLR	*Adult Gender Imbalance Ratio in Literacy Status*: Ratio of females to males among the literate population aged 15+ years multiplied by the sex ratio of the same age group	PC [2001]	Same	Status of adult female literacy compared to adult male literacy
	GIRE	*Adult Gender Imbalance Ratio in Non-agricultural Occupations*: Ratio of females to males among the population aged 15+ years engaged in non-agricultural occupations multiplied by the sex ratio of the same age group	PC [2001]	Same	Status of adult female involvement in non-agricultural occupations compared to adult male involvement
	Disadvantaged Groups				
	PEDEGP	*Percentage of Educationally Disadvantaged Population:* Educationally disadvantaged (ethnic) population as a percentage of total population	[PC 2001]	Definition changed	In the 1997 study, certain caste/ethnic groups were assumed to be educationally disadvantaged based on their low literacy rates at the national level. In the present study, caste/ethnic groups with literacy rates below or equal to 30% in a particular district were taken to be educationally disadvantaged.
	Marginal Farm Households				
	PLM	*Percentage of Marginal Farm Households:* Marginal farm households (with operational agricultural landholdings $\leq$0.5 ha) as a percentage of total households multiplied by the agricultural labour force (the ratio of usually economically active population engaged in agriculture to the total usually economically active population).	PC [2001]	Different data source, definition changed	The data from the 2001/02 agriculture census were not available; unpublished data on operational agricultural landholdings from the 2001 population census were used.
	Food Production				
	PCFA	*Per Capita (Per Diem) Food Production:* The caloric value of food production (rice, wheat, maize, millet, barley, and potatoes) divided by the rural population, per day	MoAC [2000/01] (food prod.), PC [2001] (rural population), CFRL [1986]	Not adjusted for adult equivalence	

Index	Indicator	Definition	Source (Data Year)	Comparison with 1997	Remarks
SEIDI	***Socioeconomic and Infrastructural Development***				
HDI	Health and Development				
	CPR	*Contraceptive Prevalence Rate*: Number of fertile couples using a contraceptive method per 100 married women of reproductive age	DoHS [2001]	Same	Status of family planning/ population control measures
	WATER	*Drinking Water Coverage*: Households having access to taps, piped water, or tube-well water for drinking as a percentage of total households	PC [2000/2001]	Different data source, definition changed	In the 1997 study, the population with access to safe water was considered. In the present study, households with access to pipes and tube-wells as a source of drinking water were taken as an alternative indicator.
	TOILET	*Toilet Facilities*: Households using any type of toilet facility (flush, pit, other) as a percentage of total households	PC [2001]	New	Sanitation status
PSDI	Primary Sector Development				
	ACREDIT	*Agricultural Credit:* Population with an agricultural loan as a percentage of usually economically active population aged 15+ years engaged in agricultural occupations	ADB/N [2001/ 2002] (loanee population) PC [2001]	Different data source, definition changed	Availability of agricultural credit
	FARMSIZE	*Farm Size*: Operational agricultural land area in hectares divided by the number of farm households	PC [2001]	Different data source	As data from the 2001/02 agriculture census were not available, unpublished operational data on the agricultural land area from the 2001 population census were used provisionally.
	LIVE	*Livestock per Farm Household*: Number of livestock kept for agricultural purposes divided by number of farm households. Livestock refer to domestic animals like cattle, yak, buffalo, goats, sheep, pigs, rabbits and others. Livestock used for transportation and other-than-agricultural work are not included.	PC [2001]	Different data source, definition changed, not weighted	As data from the 2001/02 agriculture census were not available, unpublished operational data of livestock holdings from the 2001 population census were used provisionally.
	IAPAA	*Percentage of Irrigated Area:* Year round and seasonal irrigated land area as a percentage of operational agricultural land area in hectares	MoAC 2001 (irrigated land) PC [2001] (unpublished operational agricultural land area)	Different data source, definition changed	

Index	Indicator	Definition	Source [Data Year]	Comparison with 1997	Remarks
IDI	Infrastructure Development				
	ROAD	*Road Density*: Sum of all categories of road as a percentage of total surface area (in km per 100 km^2)	DoR [2001]	Not weighted	
	BANK	*Bank Density:* Number of banks per 1000 population divided by population distance*	NRB [2002]	Same	Projected population for 2002 was used
	COOP	*Cooperatives Density:* Number of cooperatives per 1000 population divided by population distance*	DoC [2002]	Same	Projected population for 2002 was used
	PHI	*Health Institutions Density:* Number of health institutions per 1000 population divided by population distance*	DoHS [2001]	Same	
	PPO	*Post Office Density:* Number of post offices per 1000 population divided by population distance*	DoPS 2001/02	Same	Projected population for 2002 was used
	FORESTHH	*Percentage of Forest User Households:* Percentage of total households who are members of forest user groups	CFD/DoF 2003	Same	Estimated number of households for 2003 was used
	PCREXP	*Per Capita Regular Budget Expenditure:* Total regular budget expenditure in NRs divided by total population	FCGO [2001]	Changed	Regular budget expenditure rather than budget allocation (as in the 1997 study) as more realistic
	PCDEXP	*Per Capita Development Budget Expenditure:* Total development budget expenditure in NRs divided by total population	FCGO [2001]	Changed	Development budget expenditure rather than allocation
	Overall Literacy				
	LR	*Overall Literacy Rate*: Literate population aged 6 years and above as a percentage of the total population of the same age group	PC [2001]	Same	
	Broad Occupational Structure				
	EMPS	*Broad Occupational Structure*: Ratio of usually economically active population of 15+ years engaged in non-agricultural occupations compared to agricultural occupations	PC [2001]	Same	Status of economic diversification
WEI	***Women's Empowerment***				
	FLR	*Percentage Share of Females in Literacy:* Literate female population of age 10+ years as a percentage of total literate population in the same age group	PC [2001]	Same	Share of females in literacy
	PWNAG	*Percentage Share of Females in Non-agricultural Occupations:* Female population of age 15+ years engaged in non-agricultural occupations as a percentage of total population of the same age group engaged in the same activities	PC [2001]	Same	Share of adult females in non-agricultural occupations
	F_TEACH	*Percentage Share of Female Teachers at Primary Level*: Number of female teachers in primary schools as a percentage of total primary schoolteachers	DoE [2001]	Same	Participation of females as primary teachers
	G_ENR	*Percentage Share of Girls Enrolled at Primary Level:* Number of girls enrolled at primary level as a percentage of total enrolment at the same level	DoE [2001]	Same	Girls' enrolment in primary schools

*Population distance is the square root of the reciprocal of population density

Table 1: Data Sources

ADB/N	Agriculture Development Bank/Nepal	Primary data – loanee population
CFD/DoF	Community Forest Division, Department of Forest	Primary data – forest user households
CFRL	Central Food and Research Laboratory	CFRL (1986)
DoC	Department of Cooperatives	Primary data – number of cooperatives
DoE	Department of Education	DoE (2003)
DoHS	Department of Health Services	DoHS (2001)
DoPS	Department of Postal Services	Primary data, post office statistics
DoR	Department of Roads	Primary data, road statistics 2000 (length of different categories of road
FCGO	Financial Comptroller General Office	FCGO (2001) and primary data, budget expenditure
MoAC	Ministry of Agriculture and Cooperatives	MoAC (2001)
NRB	Nepal Rastra Bank	NRB (2002) and primary data – number of banks
PC 2001	Population Census 2001	CBS (2002), CBS (nd, b)

Computation of Composite Indices

The 29 basic indicators may be viewed as 29 aspects of the level of development performance at the district level. A district identified as least developed by one indicator may not be identified as least developed by another indicator. In theory, these 29 indicators could generate 29 different sets of least developed districts. In order to achieve one overall composite index, the 29 indicators were aggregated into next level indices in three stages (Figure 1).

First stage indices

In the first stage, the 29 indicators were reduced to 14 through combination into indices that reflect the prevailing socioeconomic conditions in the districts.

- The three indicators child illiteracy rate, child economic activity rate, and proportion of child marriage were aggregated to form the **Child Deprivation Index (CDI)**.
- The two indicators adult gender imbalance ratio in literacy status, and adult gender imbalance ratio in non-agricultural occupations were aggregated to form the **Gender Discrimination Index (GDI)**.
- The three indicators contraceptive prevalence rate, drinking water coverage, and toilet facilities) were aggregated to form the **Health Development Index (HDI)**.
- The four indicators agricultural credit, farm size, livestock per farm household, percentage of irrigated area were aggregated to form the **Primary Sector Development Index (PSDI)**.
- The eight indicators road density, bank density, cooperatives density, health institutions density, post office density, percentage of forest user households, per capita regular budget expenditure, and per capita development budget expenditure were aggregated to form the **Infrastructural Development Index (IDI)**.

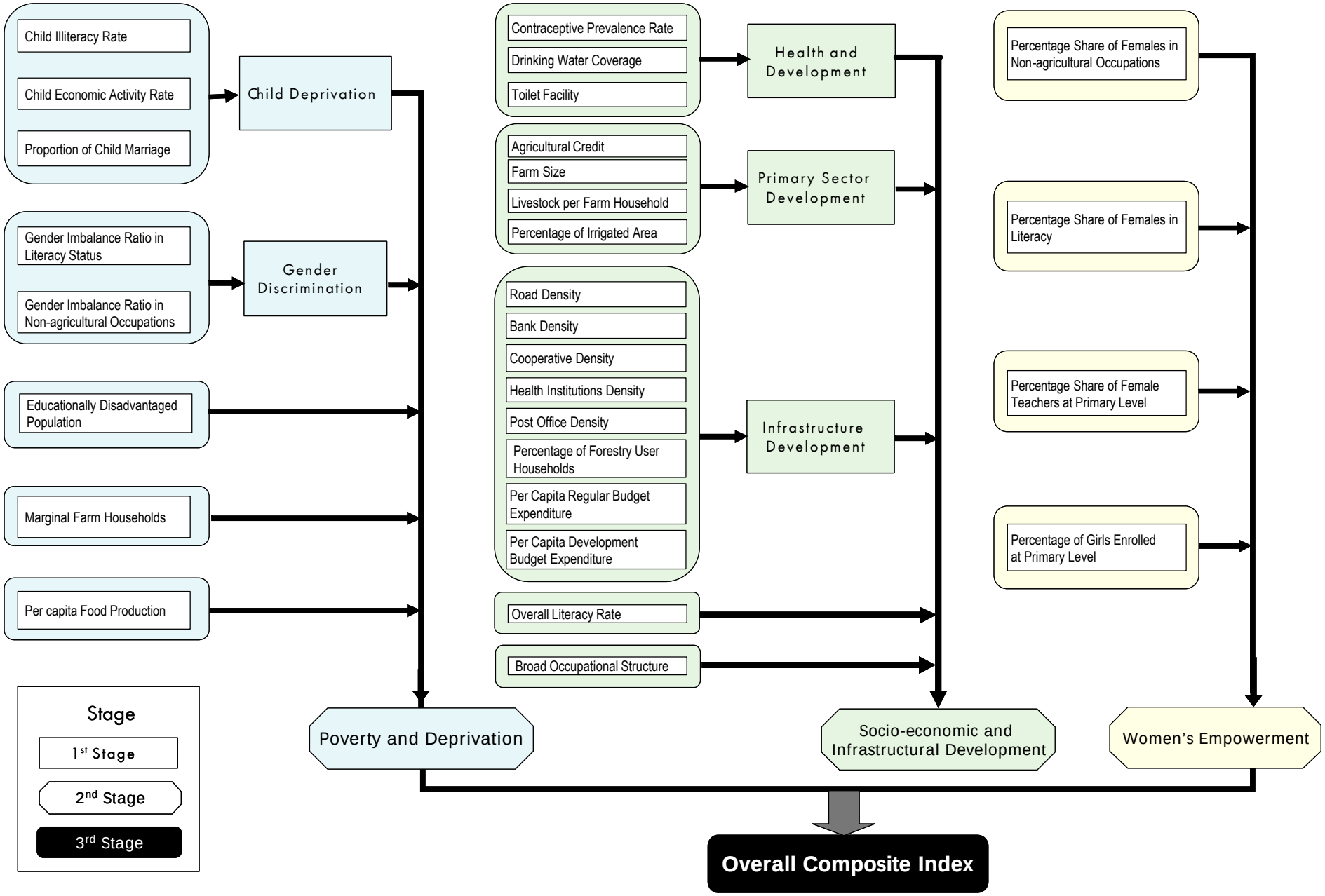

Figure 1: Scheme of aggregation of the 29 indicators to form an Overall Composite Index

The remaining nine indicators were not aggregated at this stage.

Second stage indices
In the second stage, the five first stage indices and remaining nine primary indicators were further reduced to three indices.

- The indices for child deprivation and gender discrimination were combined with the indicators for percentage of educationally disadvantaged population, percentage of marginal farm households, and per capita food production to produce the **Poverty and Deprivation Index (POVDEPI)**.
- The indices for health and development, primary sector development, and infrastructure development were combined with the indicators for overall literacy rate and broad occupation structure to produce the **Socioeconomic and Infrastructural Development Index (SEIDI)**.
- The indicators for percentage share of females in literacy, percentage share of females in non-agricultural occupations, percentage share of female teachers at primary level, and percentage share of girls enrolled at primary level were combined to produce the **Women's Empowerment Index (WEI)**.

Third stage index
In the third stage, the three indices of the second stage were aggregated to form an **Overall Composite Index (OCI)**.

Aggregation method of basic indicators
A zero-to-one scoring method was used to aggregate the indicators (see Annex 1 for mathematical explanation of zero-to-one transformation). This method ensures that the final indicator values are ranked so that an increase in value corresponds to an increase in performance regardless of whether initial values increased with a decrease in performance (from most developed to least developed) or increased with an increase in performance (from least developed to most developed).

The nine indices or weighted indicators (CDI, GDI, HDI, PSDI, IDI, POVDEPI, SEIDI, WEI, and OCI) were constructed by aggregating or, equivalently, summing the weighted scores of the appropriate basic indicators and indices (see Annex 1 for mathematical explanation of their construction).

GIS Mapping

The development levels of the districts as indicated by the values of the indicators and indices were displayed in map form using ArcGIS software from ESRI and using as the base a district map from the Department of Survey 1988 at a scale of 1:250,000 digitised by MENRIS (Map 1).

All districts were ranked according to the weighted scores (Table 2). The 75 districts were categorised into three groups: least developed (districts with ranks 1 to 25), intermediate (districts with ranks 26 to 50), and most developed (districts with ranks 51 to 75). The rank forms the basis of categorisation for mapping of the nine indices. The 75 values of each of the 29 basic indicators were also mapped separately. For each map, districts were classified as least developed, intermediate, and most developed by arranging the 75 districts in ascending order according to their level of performance.

The ranking according to the Overall Composite Index is shown in Map 2; the ranking according to the Poverty and Deprivation Index (PDI), the Socioeconomic Infrastructural Development Index (SEIDI), and Women's Empowerment Index (WDI) are shown in Map 3-5; the ranking according to the indices and level of performance of indicators, contributing to the PDI, SEIDI, and WEI are shown in Maps 6–16, 17–35, and 36–39, respectively.

Major findings and analysis

Sensitivity analysis

There are four possible combinations of the three dimensions of development performance (poverty and deprivation; socio-economic and infrastructural development; and women's empowerment) considered in this study. The results in terms of ranks of districts in each of these possible combinations were compared, and in each case the 25 least developed districts identified. The districts common to all four combinations or configurations were identified. Eight districts – Achham, Bajura, Dadeldhura, Darchula, Jajarkot, Jumla, Rolpa, and Rukum – were among the least developed in all configurations. Most of these are mountain and hill districts in the Mid-Western and Far Western Development Regions.

Analysis of patterns seen in maps

The 25 least developed districts as identified by the Overall Composite Index are listed in Table 2 and shown in Map 2. The distribution of these among the country's 15 eco-development regions (the mountain, hill and Terai areas of the five development regions) is summarised in Table 3. Six of the 20 Terai districts (30%), 9 of the 40 hill districts (23%), and 10 of the 15 mountain districts (62%) were among the 'least developed'. There was at least one least developed district in each of the five development regions, with the greatest number, nine, located in the Mid-Western Development Region and the greatest proportion (seven of nine) in the Far Western Development Region. Two clusters of worst-performing districts emerged from the ranking exercise: one group of contiguous districts in the hill and mountain districts of the Far Western and Mid-Western Development Regions; and one group of contiguous districts in the central Terai region. A total of 16 of the 24 districts in the Far Western and Mid-Western Development Regions were among the country's least developed districts. In the Central Development Region it was seven out of 19, five of them in the Terai.

The Overall Composite Index indicates that Mugu, Humla, and Bajhang are the country's three least developed districts overall (Map 2). The three least developed in terms of the Poverty and Deprivation Index were Mugu, Achham, and Humla (Map 3); in terms of the Socioeconomic and Infrastructural Development Index they were Achham, Bajhang, and Mugu (Map 4); and in terms of the Women's Empowerment Index they were Mugu, Bajhang, and Humla (Map 5). In other words only four districts appear among the three least developed in all three indices: and all are located in the mountains and hills of the Mid-Western and Far Western Development Regions, where the country's seven least-developed districts are clustered (Map 2).

Comparison with 1997 indicators

As far as possible, this study attempted to prepare the same indicators as used in the 1997 study so that a direct comparison would be possible. However, some indicators could not be included as no more recent data were available, and some changes in definitions had to be made as a result of the definitions used and data collected in the currently available data sources. This means that the ranking of districts by individual indicators or indices may differ from those in the 1997 study as a result of the incomparability of data rather than of actual change. An attempt was made during the analysis to analyse reasons for changes in the ranking of districts, but this proved impossible as the lack of direct data comparability caused too many misleading anomalies. However, the general pattern of performance by districts across the country remains the same. The ranking of districts according to the Overall Composite Index for 1997 (recalculated without the indicators for Natural Resources Endowment and Management) and 2001 is shown in Table 2.

Table 2: Ranking of Districts Based on Weighted Scores

Index / District	Overall Composite 2001	Overall Composite* 1997	PDI+ 2001	SEIDI+ 2001	WEI+ 2001
Kathmandu	**1**	1	9	1	2
Chitwan	**2**	11	3	4	8
Jhapa	**3**	4	1	6	16
Bhaktapur	**4**	10	12	3	13
Lalitpur	**5**	3	21	2	9
Kaski	**6**	5	4	7	3
Dhankuta	**7**	6	2	14	12
Palpa	**8**	14	14	13	4
Syangja	**9**	8	22	21	1
Manang	**10**	2	25	10	5
Morang	**11**	16	5	9	24
Ilam	**12**	9	6	11	19
Rupandehi	**13**	38	11	5	31
Sunsari	**14**	21	10	8	27
Kabhrepalanchok	**15**	35	18	12	21
Tanahu	**16**	15	23	31	7
Terhathum	**17**	7	13	22	25
Sankhuwasabha	**18**	18	7	43	22
Mustang	**19**	13	33	17	17
Parbat	**20**	12	39	23	11
Dang	**21**	34	8	28	32
Lamjung	**22**	17	35	30	14
Panchthar	**23**	23	17	38	23
Baglung	**24**	26	45	26	10
Myagdi	**25**	22	44	42	6
Makawanpur	**26**	40	26	16	35
Gulmi	**27**	24	38	33	15
Surkhet	**28**	32	24	20	34
Solukhumbu	**29**	31	28	44	20
Banke	**30**	36	16	15	47
Bhojpur	**31**	27	15	41	36
Gorkha	**32**	20	34	45	18
Taplejung	**33**	19	27	37	28
Bardiya	**34**	43	20	35	40
Kanchanpur	**35**	33	19	24	49
Nuwakot	**36**	41	29	32	38
Nawalparasi	**37**	29	36	36	33

* OCI 1997 excluding Natural Resources Endowment Index

Table 2: Ranking of Districts Based on Weighted Scores (cont...)

Index / District	Overall Composite 2001	Overall Composite* 1997	PDI+ 2001	SEIDI+ 2001	WEI+ 2001
Khotang	**38**	28	30	52	29
Okhaldhunga	**39**	30	32	34	37
Kailali	**40**	46	31	27	42
Dolakha	**41**	47	47	25	41
Arghakhanchi	**42**	25	50	47	26
Udayapur	**43**	39	41	48	39
Dhading	**44**	37	51	54	30
Salyan	**45**	51	40	51	46
Dhanusa	**46**	57	46	18	59
Saptari	**47**	52	37	19	62
Sindhupalchok	**48**	50	60	50	43
Sindhuli	**49**	44	56	58	45
Pyuthan	**50**	42	54	57	48
Ramechhap	**51**	48	53	62	50
Parsa	**52**	53	43	29	63
Rasuwa	**53**	49	62	59	44
Kapilbastu	**54**	54	48	53	58
Bara	**55**	55	42	39	67
Dadeldhura	**56**	58	52	49	57
Darchula	**57**	45	59	60	52
Siraha	**58**	60	49	40	65
Jajarkot	**59**	66	58	69	51
Rukum	**60**	63	55	67	53
Sarlahi	**61**	56	57	46	64
Baitadi	**62**	64	63	55	60
Dailekh	**63**	67	64	66	55
Rolpa	**64**	62	65	68	54
Mahottari	**65**	61	61	56	71
Doti	**66**	70	66	64	61
Dolpa	**67**	59	69	71	56
Rautahat	**68**	65	68	61	72
Jumla	**69**	69	67	65	70
Kalikot	**70**	74	71	63	69
Bajura	**71**	68	72	70	66
Achham	**72**	75	74	75	68
Bajhang	**73**	71	70	74	74
Humla	**74**	73	73	72	73
Mugu	**75**	72	75	73	75

+ PDI = Poverty & Deprivation Index; SEIDI = Socioeconomic & Infrastructural Development Index; WEI = Women's Empowerment Index

Table 3: Distribution of least developed districts over 15 eco-development regions

Eco-belt	Development Region										Total	
	Eastern		Central		Western		Mid-Western		Far Western			
Terai	1	[5]*	5	[7]	0	[3]	0	[3]	0	[2]	**7**	**[20]**
Hill	0	[8]	1	[9]	0	[11]	4	[7]	4	[4]	**9**	**[39]**
Mountains	0	[3]	1	[3]	0	[2]	5	[5]	3	[3]	**9**	**[16]**
Total	**1**	**[16]**	**7**	**[19]**	**1**	**[16]**	**9**	**[15]**	**7**	**[9]**	**25**	**[75]**

* [x] = total no. of districts in category

Table 4: Correlation coefficients of social indicators

Social indicators	Correlation with overall literacy 2001	Correlation with overall literacy 1997
Child illiteracy rate	-0.91	-0.96
Child economic activity rate	-0.83	-0.90
Proportion of child marriage	-0.35	-0.37
Adult gender imbalance ratio in literacy status	0.89	0.86
Adult gender imbalance ratio in non-agricultural occupations	0.54	0.56
Contraceptive prevalence rate	0.66	0.73
Percentage share of females in literacy	0.83	0.87
Percentage share of females in non-agricultural occupations	0.59	0.67
Percentage share of females teachers at primary level	0.70	0.67
Percentage share of girls enrolled at primary level	0.76	0.85
Infant mortality rate	N/A	-0.53

Table 5: Correlation coefficients of infrastructural indicators with road density

Infrastructural indicators	Correlation with road density 1997	Correlation with road density 2001
Bank density	0.72	0.93
Cooperatives density	0.60	0.85
Per capita public budget expenditure	0.65	0.64

Interrelationships

The relationship between selected indicators and overall literacy was examined using correlation analysis. The correlation coefficients show that the issues of child deprivation, gender discrimination, and women's empowerment are more serious in those districts where the overall literacy rate is lower than in those districts where the overall literacy rate is higher. Specifically, there are relatively high correlations between the overall literacy rate and the child illiteracy rate, child economic activity rate, proportion of child marriage, gender imbalance ratio among the literate adult population, gender imbalance ratio among the non-agricultural adult labour force, percentage share of females in the literate population, percentage share of females in non-agricultural occupations, percentage share of females in primary level teaching, and percentage share of girls enrolled at primary level (Table 4). Moreover, higher literacy seems to be associated with higher contraceptive prevalence. A similar analysis in the 1997 study showed a similar pattern of association between indicators.
Roads, in general, play an important role in the development of infrastructure. Correlation analysis showed that the density of both banks and cooperatives, and per capita public expenditure are higher in those districts where the road density is higher. The correlation between road density, and the density of both banks and cooperatives appeared to be higher than in the 1997 study, whereas the correlation between road density and public expenditure is almost the same as previously (Table 5).

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