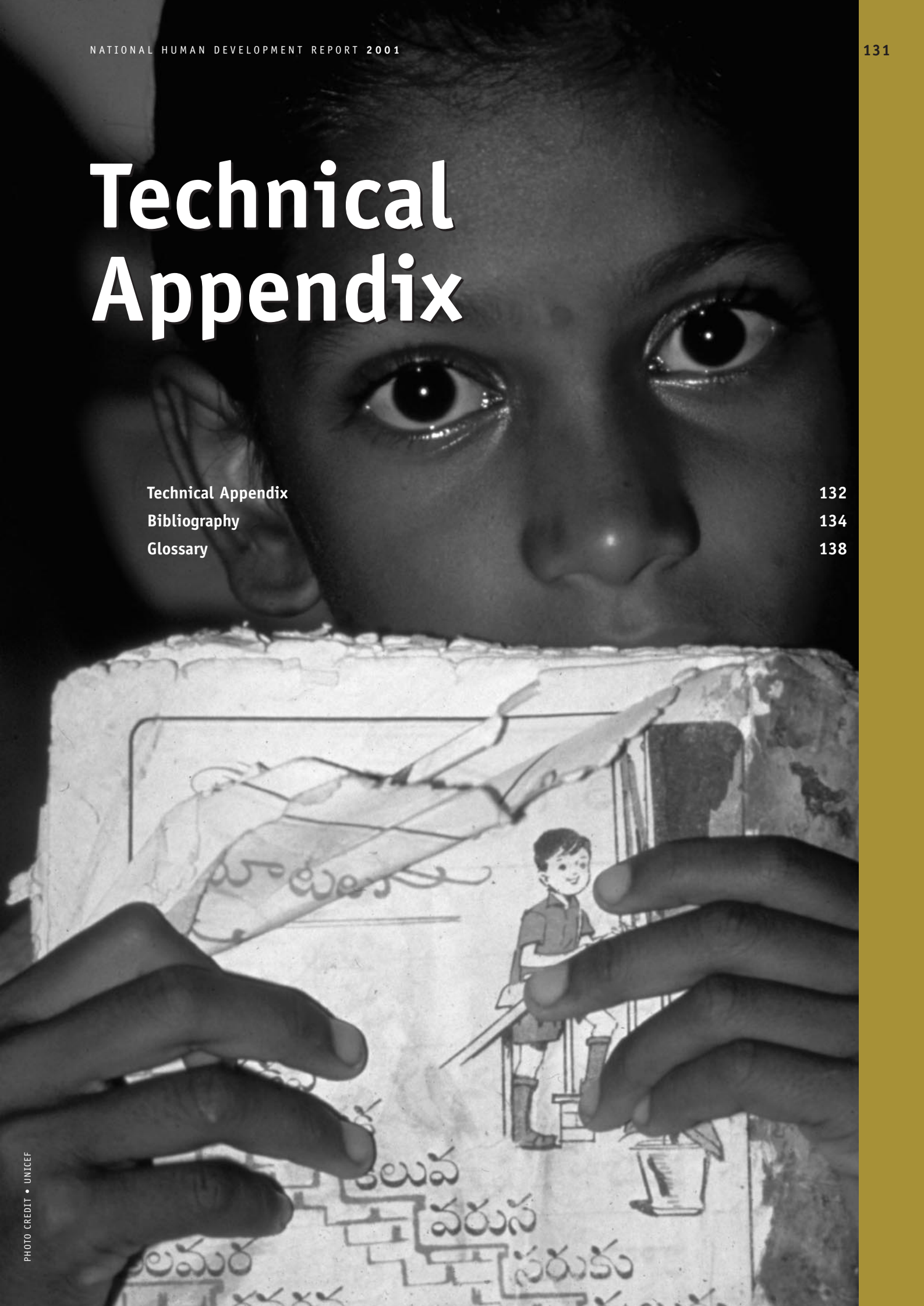


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Technical Appendix

Constructing the Composite Indices

As a summary measure, a composite index of diverse indicators, even when it is conceptually and methodologically difficult to put together, is a useful tool in policy planning. It helps in facilitating comparisons with other composite measures. While building composite indices from among the identified indicators for this Report, a major objective was to develop a core set of indices that reflect, in some sense, the common concerns, social values and development priorities of all States. It would help in a meaningful comparison of the human development status across States. It was, therefore, felt necessary to have core indices that are functionally decomposable at State and sub-State levels. The other concern that had to be reflected, relates to the need to evolve a set of indices, which could adequately capture inter-temporal changes and policy sensitivity in various dimensions of human well being. All these issues were addressed through the selection of indicators for each of the identified dimensions of well-being, the scaling procedure and the weights adopted for putting them together in a composite measure. For all the indices, human well-being or deprivation was assessed for the following three dimensions:

- Longevity — the ability to live long and healthy life;
- Education — the ability to read, write and acquire knowledge; and
- Command over resources — the ability to enjoy a decent standard of living and have a socially meaningful life.

In scaling the diverse indicators, the main consideration has been to make attainments on each of them comparable and at the same time ensuring that the selection of end points, i.e., the maximum and the minimum value on the scales for each indicator are such that they support inter-temporal comparison for a reasonable period of time starting 1980. The scaling norms that have been selected would remain valid at least till about 2020, at a reasonably improved pace of human development. While selecting the norms, the attainments of the best performing State on the concerned indicators and the comparable international norms were also kept in mind. The issue of weights to combine the identified indicators on each of the three dimensions of well-being can always be debated. This report has adopted a predominantly normative approach, as against a purely empirical basis of deriving weights to

club different indicators. Conceptually, there are good reasons to suggest that different aspects of well-being have to be co-realizable for an individual to have a meaningful sense of well-being in today's context. It follows that attainments on each aspect of well being are equally important and hence should be equally weighted.

Human Development Index

$$HDI_j = 1/3 * \sum_i (X_i)$$

where HDI is for the j^{th} State, i goes from 1 to 3; and

$$X_i = (X_{ij} - X_i^*) / (X_i^{**} - X_i^*)$$

where X_{ij} refers to attainment of the j^{th} State on the i^{th} indicator; X_i^{**} and X_i^* are the scaling maximum and minimum norms, such that:

- X_1 : Inflation and inequality adjusted per capita consumption expenditure;
 X_2 : Composite indicator on educational attainment;
 X_3 : Composite indicator on health attainment.

$$X_2 = [(e_1 * 0.35) + (e_2 * 0.65)]$$

where e_1 is literacy rate for the age group 7 years and above, and e_2 is adjusted intensity of formal education.

$$X_3 = [(h_1 * 0.65) + (h_2 * 0.35)]$$

where h_1 is life expectancy at age one, and h_2 is infant mortality rate. In case of IMR the reciprocal of the indicator has been used.

Human Poverty Index As in the case of HDI, for constructing the HPI deprivation in health, educational and economic dimensions have been equally weighted. However, within the composite deprivational measure on education, as well as on economic aspects, based on a sensitivity analysis, indicators with somewhat distinct attributes have been clubbed using unequal weights so as to reflect appropriately the country's context, development priorities and the desired policy focus.

$$HPI_j = [1/3 * (P_1^3 + P_2^3 + P_3^3)]^{1/3}$$

where HPI is for the j^{th} State and P_i , i goes from 1 to 3 refers to the deprivation in the three identified dimensions, such that:

- P_1 : Longevity deprivation captured by the indicator persons not expected to survive beyond age 40 years;
 P_2 : Composite indicator on educational deprivation;

P_3 : Composite indicator on economic deprivation.

$$P_2 = (ed_1 * 0.35) + (ed_2 * 0.65)$$

where ed_1 is illiteracy rate for the population in the age group 7 years and above, and ed_2 is proportion of children in the age group 6-18 years not enrolled in the schools.

$$P_3 = 1/4 * \sum_i (P_{3i})$$

where i goes from 1 to 4, such that:

P_{31} : Proportion of population below the poverty line;

P_{32} : Proportion of population not receiving medical attention at birth. This indicator has been substituted in the alternate HPI for 1991 by proportion of children, in the age group 12 to 23 months, not fully vaccinated;

P_{33} : Proportion of population living in kutcha houses;

P_{34} : Proportion of population without access to basic amenities, including the access to safe drinking water, sanitation, and electricity. For 1981 a simple average has been taken of the population not having access to any of these amenities individually. Whereas for 1991, in the alternate HPI the cross tabulation of population not having access to any of these amenities has been used.

Gender Equality Index The methodology for constructing the GEI is the same as that of HDI. The point of departure involves expressing the index as a proportion of attainment level for females to that of males. Secondly, in estimating the index, the economic attainments for males and females have been captured by taking the respective worker-population ratio, unlike the use of per-capita monthly expenditure as in the HDI. This has been done, primarily, to avoid taking a recourse to apportioning consumption or income, between males and females at the household or at an individual level, using criteria that could always be debated. Educational and health attainments have been captured using the same set of indicators as in the case of HDI.

Constructing Development Radars

The different indicators included in the development radars have been scaled and normalised to take a value on a scale ranging from 0 to 5. As a result, on each indicator including the IMR and poverty ratio, where the reciprocal of the indicator has been used, the scaled least achievement corresponds to 0 whereas the best achievement is closer to 5. In undertaking the said scaling procedure, desirable norms had to be adopted for

the chosen indicators. In some cases the norms are self-selecting, as for instance, is the case with access to safe drinking water or literacy rate and in some others like per capita consumption expenditure or even infant mortality rate, there is an element of value judgment. In case of the inflation adjusted per capita consumption expenditure (at 1983 prices) the maximum has been pegged at Rs.500 per capita per month. For poverty ratio the minimum has been kept at 5 per cent such that it corresponds to a value of 5 on a scale of 0-5 on the radar. In all other cases the scaling norms are as per the following table.

Scaling Norms for HDI		
Indicator	Minimum	Maximum
Consumption Expenditure (per capita per month)	Rs.65	Rs.325
Literacy Rate for 7+ years	0	100
Adjusted intensity of formal education (Estimated)	0	7
Life expectancy at age one	50 years	80 years
Infant mortality rate	20 per 1000	—

Assumptions for Filling Data Gaps

The primary source of data for the Report is the Census of India. It has been supplemented mainly by data from NSSO and NFHS. For sake of completeness and with a view to have core indices for all States and UTs, data in respect of some indicators, especially life expectancy at age one and IMR have been estimated for small States and UTs. In this case the Census data has been used in conjunction with data from SRS, RGI. The principle adopted is that of physical contiguity or similarity in socio-economic or demographic profile of the population. Thus, for some indicators, where required, data for the North-Eastern States has been generated by using data from Assam; for Chandigarh the data has been taken from either urban Punjab or Delhi; Goa's data has been repeated for Daman & Diu; Tamil Nadu's/Kerala's data has been used for Pondicherry/Lakshwadeep; Tamil Nadu's data has also been used for Andaman & Nicobar; Gujarat's data has been used for Dadra & Nagar Haveli; Himachal Pradesh's data has been used for Jammu & Kashmir; and Maharashtra's data has been used for Goa. For Jammu & Kashmir and Assam intrapolation has been done to generate data for the years when Census was not held. In case of IMR for 1991 the rural-urban breakup was not available from Census. In general, the SRS based rural-urban proportions for 1991 were, therefore, used to derive the rural and urban figures corresponding to the combined IMR figures of Census 1991.

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Glossary

DP	District Panchayat
DPC	District Planning Committees
DRDA	District Rural Development Agency
GDP	Gross Domestic Product
GEI	Gender Equality Index
GoI	Government of India
GP	Gram Panchayat
GS	Gram Sabha
GSDP	Gross State Domestic Product
HDI	Human Development Index
HDR	Human Development Report
HPI	Human Poverty Index
ICDS	Integrated Child Development Services
ILO	International Labour Organisation
IMR	Infant Mortality Rate
JFM	Joint Forest Management
kWh	Kilo Watt Hour
MMR	Maternal Mortality Rate/Ratio
NA	Not Available
NFE	Non Formal Education
NFHS	National Family Health Survey
NGO	Non Governmental Organisation
NHDR	National Human Development Report
NSDP	Net State Domestic Product
NSSO	National Sample Survey Organisation
NWC	No Where Children
PPP	Purchasing Power Parity
PRI	Panchayati Raj Institutions
SDP	State Domestic Product
SFC	State Finance Commission
SNA	System of National Accounts
SRS	Sample Registration System
TFR	Total Fertility Rate
UNDP	United Nations Development Programme
UTs	Union Territories
ZP	Zilla Parishad
Lakh	1,00,000
Crore	Ten Million
—	Negligible or Not Available