Gendering Human Development Indices:
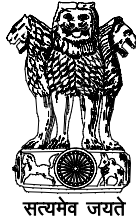
Recasting the Gender Development Index and Gender Empowerment Measure for India

Towards a new dawn

Gendering Human Development Indices:

Recasting the Gender Development Index and Gender Empowerment Measure for India

Indian Institute of
Public Administration

Towards a new dawn

Ministry of Women and Child Development
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राज्य मंत्री (स्वतंत्र प्रभार)
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**MINISTER OF STATE (INDEPENDENT CHARGE)
MINISTRY OF WOMEN & CHILD DEVELOPMENT
GOVERNMENT OF INDIA
NEW DELHI-110001**

कृष्णा तीरथ
Krishna Tirath

Foreword

The goals of human development cannot be achieved without the development and empowerment of women. Despite over 60 years of Independence, severe gender discrimination is pervasive. Inclusive growth and development cannot be achieved by India if our women do not have access to education, health care and productive resources.

However, the reality that women face is that of disparities in access to and control over resources.

UNDP's human and gender development and empowerment indices have shifted the development debates and attention from Gross Domestic Product to multi-dimensional variables in measurement of development. However, it was felt that the Gender-related Development Index (GDI) and a Gender Empowerment Measure (GEM) developed by UNDP should be recast to reflect Indian realities through inclusion of additional indicators. I am glad that the Ministry of Women and Child Development has taken the initiative and it gives me great pleasure to present the First Report on "Gendering Human Development Indices : Recasting The Gender Development Index and Gender Empowerment Measure for India". The Report estimates human and gender development indices for India and the 35 States/UTs within the limitations of data availability. It complies and presents HDI, GDI and GEM for India and the 35 States/UTs for two periods of time, 1996 and 2006.

I commend the hard work put in by the project team and the efforts by MWCD, IIPA and UNDP in coming together to execute this project and provide a comparative picture of the State/UT wise disparities in gender development and empowerment. We hope that States/UTs will take cognizance of this and take necessary action to bridge the gender divide in opportunities and attainments. These indices must be used as tools to analyse and understand the underlying factors responsible for creating the gender divide in opportunities and empowerment and necessary steps taken in planning, policies, programmes for bridging these gaps.

(Krishna Tirath)

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Preface

Inclusive growth requires that we ensure the overall survival, development, protection and participation of women of India. Gender development and empowerment indices are some of the tools that can be used to determine the extent to which we have succeeded in achieving inclusive growth. Recommendation 122 of the National Statistical Commission Report 2001 states among other things the following: "develop appropriate methodology for computing HDI and GDI at State level. Studies should be conducted using gender related data to highlight existing gender disparities."

While UNDP has constructed HDI, GDI and GEM for several countries of the world including India, these have been critiqued on several grounds including the fact that they have been developed from a northern perspective, and did not incorporate the perspective of the south. While some attempts have been made in the past to compile HDI, GDI and GEM none of these have been prepared for all the 35 States/ UTs or for any of the years pertaining to the last decade.

In 2007, Ministry of Women and Child Development took the decision to recast HDI, GDI and GEM for India and calculate the indices for States/UTs. UNDP provided support for this initiative with technical and financial assistance through the MWCD-UNDP project for "Promoting Gender Equality". Indian Institute of Public Administration (IIPA), New Delhi was identified as the Technical Collaborating Institution for the task. A Technical Advisory Committee was constituted for this purpose and three brainstorming workshops were held to decide on the indicators and methodology to be used to construct the indices. This initiative has culminated in the First GDI and GEM Report for India and the States/UTs titled "Gendering Human Development Indices: Recasting The Gender Development Index and Gender Empowerment Measure for India."

The HDI, GDI and GEM scores attained by the 35 States/UTs and changes in them over time show us the extent to which a state/UT has progressed in translating its growth into a better quality of life for both women and men. Gaps between HDI and GDI reflect the existence of gender disparities in translating development into equitable outcomes. The Report presents a large number of valuable tables that reflect the extent of Gender differentials in health, education, income earning opportunities, access to resources, participation in Parliament, representation in various decision making bodies and officials in the National Services are clearly visible from the national statistics and the indices that have been compiled and presented in this Report.

A large number of data gaps have constrained the estimation of GDI and GEM. It is hoped that data producing agencies will take necessary action to bridge these serious gaps at the earliest.

I congratulate MWCD, IIPA and UNDP for preparing this report and place on record my appreciation for the sincere and dedicated efforts that Ms. S. Jeyalakshmi and Professor Aasha Kapur Mehta have put into preparing this valuable Report. I hope the Governments of all the States/UTs will utilise the gender differentials revealed by this Report and take urgent action towards fostering gender equity in all spheres of development.

(Anil Kumar)

Acknowledgements

We hope that the Government of India and State Governments will use the estimates of HDI, GDI and GEM and the dimensions that comprise these to identify the gender based disparities that exist and take corrective action through policies, programmes and schemes that will enable achievement of gender just and equitable development.

Smt. S Jeyalakshmi
Statistical Adviser MWCD and
Chairperson Technical Advisory Committee, GDI and GEM Project

List of Acronyms

AGMUTs	Arunachal Pradesh, Goa, Mizoram and Union Territories
AIIC (T)	All India Indira Congress (Tiwari)
AM	Assam and Meghalaya
AYUSH	Ayurveda, Yoga, Unani, Siddha and Homeopathy
BJP	Bharatiya Janta Party
BSP	Bahujan Samaj Party
CPI	Communist Party of India
CPM	Communist Party of India (Marxist)
CSO	Central Statistical Organisation
EDEP	Equally Distributed Equivalent Percentage
EdI	Index of Knowledge
EI	Index of Economic Participation & Decision-making Power
GDI	Gender-related Development Index
GDP	Gross Domestic Product
GEI	Gender Equality Index
GEM	Gender Empowerment Measure
GP	Gram Panchayat
HDI	Human Development Index
HDRs	Human Development Reports
HI	Index of a Long and Healthy Life
HIV/AIDS	Human Immuno-deficiency Virus/Acquired Immuno-deficiency Syndrome
HPI	Human Poverty Index
IAS	Indian Administrative Service
ICT	Information and Communication Technology
IFS	Indian Forest Service
IIPA	Indian Institute of Public Administration
IMR	Infant Mortality Rate
INC	Indian National Congress
IPS	Indian Police Service

JD	Janta Dal
JP	Janta Party
LE 1	Life Expectancy at age 1
LEB	Life Expectancy at Birth
MMR	Maternal Mortality Rate/Ratio
MT	Manipur and Tripura
MWCD	Ministry of Women and Child Development
NCT Delhi	National Capital Territory of Delhi
NCP	Nationalist Congress Party
NDP	Net Domestic Product
NFHS	National Family Health Survey
NHDR	National Human Development Report
NSDP	Net State Domestic Product
NSS	National Sample Survey
NSSO	National Sample Survey Organisation
NTFP	Non-Timber Forest Produce
PI	Index of Political Participation & Decision-making Power
PoERI	Index of Power over Economic Resources
PPP	Purchasing Power Parity
PRIs	*Panchayati Raj* Institutions
SAP	Samta Party
SNA	System of National Accounts
SPBs	State Planning Boards
SRS	Sample Registration System
TAC	Technical Advisory Committee
ULBs	Urban Local Bodies
UNDP	United Nations Development Programme
UTs	Union Territories
WFPR	Work Force Participation Rate
YI	Index of A Decent Standard of Living
ZP	*Zilla Parishad*

Important Highlights

This report compiles and presents HDI, GDI and GEM for India and the States/UTs for the years 1996 and 2006.

- The Dimensions used for computing HDI and GDI are:
  - Dimension 1: 'A Long and Healthy Life'
  - Dimension 2: 'Knowledge' and
  - Dimension 3: 'A Decent Standard of Living'

- Indicators for Dimension 1, 'A Long and Healthy Life' are i) Infant Mortality Rate and ii) Life Expectancy at age 1 (negative index for infant mortality rate converted to a positive index by subtracting the value of the index from 1).

- Indicators for Dimension 2, 'Knowledge' are i) 7 + Literacy Rate and ii) Mean Years of Education (15+ age group).

- The indicator for Dimension 3, 'A Decent Standard of Living' is Estimated Earned Income per capita per annum.

- The HDI score for India was 0.530 for 1996 and 0.605 for 2006.

- For 2006, the HDI score was highest for the Union Territory of Chandigarh at 0.784 and lowest for Bihar at 0.507.

- The GDI score for India was 0.514 for 1996 and 0.590 for 2006.

- For 2006, the GDI score was highest for the Union Territory of Chandigarh at 0.763 and lowest for Bihar at 0.479.

- The Dimensions used for computing GEM are:
  - Dimension 1: 'Political Participation & Decision-making Power'
  - Dimension 2: 'Economic Participation and Decision-making Power'
  - Dimension 3: 'Power Over Economic Resources'

- Indicators for Dimension 1, 'Political Participation & Decision-making Power' are: i) % Share of Parliamentary Seats (elected); ii) % Share of Seats in Legislature (elected); iii) % Share of Seats in *Zilla Parishads* (elected); iv) % Share of Seats in *Gram Panchayats* (elected); v) % Candidates in Electoral Process in National Parties in the Parliamentary election and vi) % Electors Exercising the Right to Vote in the Parliamentary election.

- Indicators for Dimension 2, 'Economic Participation and Decision-making Power' are: i) % Share of Officials in service in Indian Administrative Service, Indian Police Service and Indian Forest Service; and ii) % Share of Enrolment in Medical and Engineering Colleges.

- Indicators for Dimension 3, 'Power Over Economic Resources' are: i) % Female/Male with Operational Land Holdings; ii) % Females/Males with Bank Accounts in Scheduled Commercial Banks (with credit limit above Rs. 2 lakh); iii) Female/Male Estimated Earned Income Share.

- While estimating GEM, wherever data was not available for a specific indicator, the Dimension score was determined by dividing the total score for the remaining indicators by the number of indicators for which data was available.

- The GEM score for India was 0.416 for 1996 and 0.497 for 2006.

- For 2006 the GEM estimate was highest for NCT Delhi at 0.564 and lowest for Nagaland at 0.289.

- An attempt was made to estimate HDI, GDI and GEM for two districts, Mahbubnagar and Jodhpur but was constrained by severe data gaps.

- The prominent data gaps that constrain the computation of indices have been presented in the report.

- The HDI, GDI and GEM scores attained by States/UTs need the attention of stake-holders at all levels so that gender-based disparities in different facets of development and empowerment are rectified through plans, policies, interventions.

Introduction

1. Introduction

Gender relations are the key to understanding the inequalities between men and women. These inequalities are expressed in many ways - explicit and implicit. The explicit measures are well known and are revealed in statistics depicting differences in the sex ratio, child infanticide, literacy rates, health and nutrition indicators, wage differentials and ownership of land and property. The implicit relations are embedded in power relations and hierarchies and are more difficult to measure. Located in the household, in custom, religion and culture, these intra-household inequalities result in unequal distribution of power, unequal control over resources and decision-making; dependence rather than self-reliance; and unfair, unequal distribution of work, drudgery, and even food. For governments and concerned citizens seeking to redress these inequalities, gender disaggregated data and indices are a means of determining the issues that they must address and monitor to determine the effectiveness of their actions.[1] Gender disaggregated data and indices are tools that can be used to identify gender inequalities, determine the issues that must be addressed, take steps to redress the inequalities, provide feedback on the effectiveness of actions and re-prioritise allocation of resources.

United Nations Development Programme's (UNDP) annual Human Development Reports (HDRs) have successfully shifted the development debates and attention from uni-dimensional, income or Gross Domestic Product based indices to the inclusion of non-income and multi-dimensional variables in measurement of development. The Human Development Reports were preceded by efforts of several social scientists to devise more welfare-sensitive measurements or indices of development that incorporate variables other than income. For instance, Morris[2] tried to measure Physical Quality of Life based on an average of three indicators, basic literacy rate, infant mortality, and life expectancy at age one. Similarly, Drewnovsky and Scott[3] combined a large set of social variables in the areas of nutrition, shelter, health, education, leisure, security, and social and physical environment to prepare a Unitary Index. In each of these indices the effort is to use one or more indicators to capture attainment with regard to different dimensions of development.

UNDP's Human Development Reports draw attention to the fact that human development is a process of enlarging people's choices. The Human Development Index (HDI) introduced by UNDP in 1990 is a simple average of three dimension indices that

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[1] Aasha Kapur Mehta (1996), "Recasting Indices for Developing Countries: A Gender Empowerment Measure", *Economic and Political Weekly*, October 26.

[2] Morris D. Morris and Michelle B. McAlphin (1982), "Measuring the Condition of India's Poor: The Physical Quality of Life Index", Promilla and Co., New Delhi.

[3] Drewnowski, J. and W. Scott. 1966. *The Level of Living Index*: UNRISD, Geneva cited in www.arab-hdr.org/publications/other/undp/hdr/1998/lebanon/biblio.pdf.

measure average achievements in a country with regard to 'A long and healthy life', as measured by life expectancy at birth; 'Knowledge', as measured by the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio; and 'A decent standard of living', as measured by estimated earned income in Purchasing Power Parity (PPP) US$. However, a nation "does not have to be affluent to treat women and men equally."[4]

The goals of human development cannot be achieved without the development and empowerment of women. However, the reality that women face is that of disparities in access to, and control over, resources. The need to include gender sensitive measures of human development was recognised as early as the second HDR. Therefore, in 1995, the UNDP introduced two new indices: a Gender-related Development Index (GDI) and a Gender Empowerment Measure (GEM).

The Gender-related Development Index adjusts the average achievements in the same three dimensions that are captured in the HDI, to account for the inequalities between men and women. The Gender Empowerment Measure focuses on opportunities and captures gender inequality in three key areas: 'Political participation and decision-making power', as measured by women's and men's percentage shares of parliamentary seats; 'Economic participation and decision-making power', as measured by two indicators – women's and men's percentage shares of positions as legislators, senior officials and managers and women's and men's percentage shares of professional and technical positions; and 'Power over economic resources', as measured by women's and

men's estimated earned income (PPP US$). The GEM was intended to measure women's and men's abilities to participate actively in economic and political life and their command over economic resources. UNDP's HDRs have estimated HDI each year since 1990 and GDI and GEM since 1995.

Human and gender development indicators are tools that have been successfully used for advocacy, ranking of geographical spaces, and as a tool for research to capture improvement in human well-being more reliably than per capita income. Further, these can be used in the political sphere as they focus on social sectors, policies and achievements.[5] As Johansson[6] points out, among the strengths of the HDI are its policy relevance and acceptability based on:

- Conceptual clarity that facilitates its power as a tool of communication;

- Reasonable level of aggregation;

- Use of universal criteria and variables; and

- Use of standardised international data explicitly designed for comparison.

UNDP HDR 1996 and 2006

HDR[7] 1996 ranked 174 countries of the world based on their scores on HDI. 57 countries attained high Human Development with HDI scores at or above 0.804. Canada was ranked first on HDI with a score of 0.951. However Canada ranked second on GDI (out of 137 countries) with a score of 0.927 and sixth on GEM (out of 104 countries) with a score of 0.685. Sweden was first on GDI with a score of 0.929 (but ninth on HDI) and Norway had the high-

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[4] UNDP Human Development Report (1994), Oxford University Press, New Delhi, p. 15.

[5] Suraj Kumar, Presentation on Measuring Human Development, Indian Institute of Public Administration, New Delhi, January 2007.

[6] Claes Johansson, (2004) Presentation on The Human Development Indices at Oxford, Sep 14 2004; United Nations Development Programme, Human Development Report Office.

[7] UNDP, (different years). Human Development Report, Human Development Report Office, Oxford University Press, New York.

est score for GEM at 0.786, (but was ranked fifth on HDI and third on GDI). 69 countries, with ranks from 58 to 126 and HDI scores between 0.796 and 0.504 were classified as having achieved medium Human Development. 48 countries (ranks 127 to 174) had HDI scores below 0.504 and were classified as having low Human Development. In 1996, India ranked 135th out of 174 countries on HDI with a score of 0.436 and was placed among the countries with low human and gender development. India's GDI score was 0.41 and GDI rank was 103 out of only 137 countries for which GDI was estimated. GEM was estimated for only 104 countries and India ranked 93 on GEM with a very low score of 0.235.

HDR 2006 estimated HDI for 177 countries. Norway had the highest rank on HDI, GDI and GEM with scores of 0.965, 0.962 and 0.932 respectively. 63 countries had high levels of Human Development with scores ranging from 0.965 to 0.800. 83 countries had medium levels of Human Development with ranks from 64 to 146 and scores from 0.798 to 0.500. 31 countries were classified as having low Human Development with scores from 0.495 to 0.311. In 2006, India ranked 126th out of the 177 countries with an HDI score of 0.611, or among Medium Human Development countries. India's GDI rank was 96 out of 136 countries for which GDI was estimated and with a score of 0.591. GEM was estimated for only 75 countries in 2006 and was not estimated for India.

World Economic Forum: Gender Gap Index

The World Economic Forum has estimated the Gender Gap Index to reflect patterns of inequality between men and women with regard to Economic Participation and Opportunity, Educational Attainment,

Table 1.1: World Economic Forum: Gender Gap Index

Area of Gender Inequality	India's Rank out of 130	India's score
Economic Participation and Opportunity	125	0.3990
Educational Attainment	116	0.8452
Health and Survival	128	0.9315
Political Empowerment	25	0.2484
Global Gender Gap Index	113	0.6060

Source: World Economic Forum (2008). The Global Gender Gap Report, Geneva, Switzerland, p.11.

Health and Survival and Political Empowerment. India ranked 113 out of the 130 countries on the Gender Gap Index 2008 with a score of 0.606 (Table 1.1).

It needs to be noted that India ranked 25th in the world on Political empowerment despite a low score of 0.2484 which reflects the low level of women's political empowerment in the world and 128th out of 130 countries on Health and Survival despite a relatively high score of 0.9315.

Critiquing UNDP's GDI and GEM

In a workshop on "Building a Framework for Measuring Gender Equity" organised by Singamma Srinivasan Foundation at Bangalore in 1996, a group of Indian women economists[8] argued that while it was commendable that UNDP had produced a report which was more women centred, the GDI and GEM developed by UNDP needed to be recast to realistically capture the gender gaps in development and empowerment in the Third World. It was argued that these indices had been developed from a northern perspective, and did not incorporate the perspective of the south. GDI did not reflect measures that were required in countries with high unemployment, high levels of poverty and inequality. Similarly, for GEM to be useful it must be created out of institutions which em-

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[8] The Indian Women Economists were Ahalya Bhat, Indira Hirway, Devaki Jain, Darshini Mahadevia, Aasha Kapur Mehta, Mukul Mukherjee, Seeta Prabhu, Anuradha Rajivan and Renuka Vishwanathan.

power the poor and look at exclusion and inclusion in those institutions in order to use the right tools for engendering a change in gender relations.[9] Alternate GDI and GEM were developed at the national level and for major States. The results for India were based on a range of different variables and the computed scores differed significantly from those prepared by UNDP.

In 1998, the then Department of Women and Child Development of the Ministry of Human Resource Development initiated consultations with State and Union Territory administrations through workshops on gender issues and indicators and developing GDI and GEM with a view to disseminating the concept and initiating exercises in gender-sensitive planning.

Subsequently the Group of Indian Women Economists developed alternative GDI and GEM for eight districts, taking two districts in each of four States of India – Gujarat, West Bengal, Karnataka and Tamil Nadu. The results showed that there was greater participation of women if institutions in which women participate are included, rather than just professional associations, official participation and Parliament.

UNDP conducted a review of the GDI and GEM in 2005-06. Problems identified for GDI in this and other reviews include[10]:

i. Misinterpretation as a measure of gender inequality. The GDI is not a measure of *gender inequality.* Rather, it is a measure of human development that adjusts the HDI to penalise for disparities between women and men in the three dimensions of the HDI; briefly, GDI is the HDI adjusted for gender disparities.[11]

ii. Problems with the way gender gaps in incomes are calculated and the implicit assumption that gender differences in earned incomes are a good representation of gender differences in access to nutrition, housing, and clothing.[12]

iii. Data availability and reliability.[13]

iv. High GDI values for high HDI countries may suggest that gender inequalities are too small to have a noticeable impact on their human development. But in reality there are some subtle gender inequalities (educational choices, quality of education, access to employment and training, promotion, pay, etc.), which the GDI is too crude to pick up, and which may have a substantial impact on human development of developed countries.[14]

v. The GDI remains a problematic indicator of gender-sensitive human development. In particular, the implied penalty for gender inequality remains dominated by the earned income component.[15]

vi. There continue to be conceptual and practical problems with the earned income component of GDI. Its interpretation is unclear and the database used to generate it is very thin, not very reliable and plagued by inconsistencies across countries.[16]

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[9] Devaki Jain (1996), "Valuing Work: Time as a Measure", *Economic and Political Weekly*, October 26; K. Seeta Prabhu, P.C. Sarker and A. Radha (1996), "Gender-Related Development Index for Indian States Methodological Issues", *Economic Political Weekly*, 31(43), 26 Oct, pp. WS - 72-WS-96; Hirway, Indira and Darshini Mahadevia (1996), "Critique of Gender Development Index: Towards an Alternative", *Economic and Political Weekly*, October 26; Aasha Kapur Mehta (1996) op. cit.

[10] Klasen, Stephan (2006), "UNDP's Gender-related Measures: Some Conceptual Problems and Possible Solutions", *Journal of Human Development*, 7 (2), July, pp. 243-274.

[11] Klasen (2006) ibid.

[12] Klasen (2006) ibid.

[13] Klasen (2006) ibid.

[14] Kalpana Bardhan and Stephan Klasen (1999). "UNDP's Gender-Related Indices: A Critical Review", *World Development* 27(6), June, pp. 985-1010.

[15] Bardhan and Klasen (1999) ibid.

[16] Bardhan and Klasen (1999) ibid.

vii. In most of the Third World countries, poverty accentuates the problems faced by women and gender relations are influenced by traditional hierarchies based on patriarchy, caste and ethnicity and compounded by inequalities of wealth and power. Women in the lower strata are not only exploited economically but are also more socially oppressed than the male working poor. Seeta Prabhu argues for construction of a comprehensive index that is sensitive to the special problems faced by women in developing countries.[17]

viii. GDI overemphasises income as a measure of welfare, has a narrow selection of variables, and omits structural dimensions such as poverty, inequality and patriarchy crucial for the development of women's capabilities in the countries of the South.[18]

ix. Additional limitations include the constraints of producing a globally comparable composite index across many countries – a more relevant index could be produced if its use was limited to one country or cluster of countries. Further, composite indices may hide more than they reveal depending on the choice of weights; method of aggregation; and mixing of output and input indicators.

The UNDP Review noted that GEM is conceptually clearer, more easily interpreted and more relevant at the country level especially as an advocacy tool to highlight poor access to positions of political and economic power. It can also include representation in local government institutions and empowerment indicators such as decision-making at the household level. It can be disaggregated to the sub-national level. However the Review noted that GEM had three primary shortcomings, among other minor issues.

i) Instead of simply considering the gender gap of earned incomes (which would be a good measure of female economic empowerment), it includes a measure that takes absolute incomes of males and females penalised for gender disparities.

ii) Gender gaps are being calculated in a complicated way in the GEM. It would probably be more intuitive to use the ratio of female-to-male achievements in the components.

iii) Poor availability of data in many countries.

The UNDP Review[19] suggested that:

- A separate HDI for men and for women could replace the GDI. Differences between the two indices might be easier to interpret than the GDI.

- Since gender disaggregated income figures are not widely available, estimating earned income for men and women is problematic when calculating both GDI and GEM. Using the wage ratio in the non-agricultural sector and the labour force participation rate by gender has shortcomings both due to lack of data and because income transfers within the household will lead to smaller intra-household differences in living standards than is reflected by the estimates of actual earnings.

- The GEM includes the absolute average level of income in a country, which means that only rich countries can achieve a high GEM score. Considering only the relative income shares of men and women rather than average income levels would remedy this problem.

- There are gender gaps in care work and these need to be addressed, as does violence.

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[17] Seeta Prabhu et al (1996) op.cit.

[18] Hirway and Mahadevia (1996) op.cit.

[19] Klasen (2006) op.cit.

The Need for Recasting GDI and GEM for India

In 2002, the Planning Commission prepared the first National Human Development Report for India (National Human Development Report 2001[20]), in which it computed the Human Development Indices (HDI), Gender Equality Indices (GEI) and Human Poverty Indices (HPI) for India and States/UTs as well as for rural and urban areas for 1981 and 1991. The indicators used to estimate HDI and GEI are given in Table 1.2. The Planning Commission also presented development radars to give a snap-shot view of the status of eight human development indicators in the early 1980s and early 1990s, as captured by per capita expenditure, infant mortality rate, life expectancy, formal education, literacy, pucca house, safe water and poverty.

Keeping in view the need for recasting GDI and GEM to suit the Indian situation and to develop comparable indices for States/UTs, the Ministry of Women and Child Development, Government of India, took up the activity of compiling GDI and GEM for India and for all the States/UTs in January 2007, under the MWCD-UNDP Project, "Promoting Gender Equality".

Table 1.2: HDI and GEI – Departures from UNDP Indices

UNDP-Indicators	Attainments	NHDR-Indicators
Life Expectancy at Birth	Longevity	Life Expectancy at age 1 and Infant Mortality Rate
Adult Literacy Rate with Combined Gross Enrolment Ratio	Educational Attainment	Literacy Rate 7+ and intensity of Formal Education
Real GDP per capita in PPP$	Economic Attainment	Per capita real consumption expenditure adjusted for inequality; and Worker population ratio in case of Gender Equality Index

Source: Planning Commission, (2002) National Human Development Report 2001, New Delhi, page 23.

The Outcome

This report compiles and presents GDI and GEM for India and the States/UTs for the years 1996 and 2006. An attempt has also been made to compile these indices for two districts, namely Mahbubnagar in Andhra Pradesh and Jodhpur in Rajasthan, for the same two time points. The report also highlights the prominent data gaps that constrain the computation of indices. The indices have been analysed and the conclusions are presented to draw the attention of stake-holders at all levels to gender-based disparities in different facets of development and empowerment so as to enable corrective policies, programmes and schemes.

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[20] Planning Commission, National Human Development Report 2001, New Delhi, 2002.

Ministry of Women and Child Development's Initiative: The Process of Recasting the GDI and GEM for India and the States/Union Territories

2. Ministry of Women and Child Development's Initiative: The Process of Recasting the GDI and GEM for India and the States/Union Territories

GDI and GEM developed by UNDP are based on a northern perspective and do not incorporate the perspective of the South. How can we recast GDI and GEM to make them meaningful for India within the limitations of data availability? Can GDI and GEM become effective instruments for building gender equity?

With this as the objective, the Ministry of Women and Child Development (MWCD) decided to recast GDI and GEM for India and for the States/Union Territories (UTs). UNDP provided support for this initiative with technical and financial assistance through the MWCD-UNDP project, "Promoting Gender Equality". Indian Institute of Public Administration (IIPA), New Delhi was identified as the Technical Collaborating Institution for the task **(Annexure 1)**. In January 2007, MWCD constituted a Technical Advisory Committee (TAC) with Smt. S. Jeyalakshmi, Statistical Adviser, MWCD, as the Chairperson and Prof. Aasha Kapur Mehta, Professor of Economics, IIPA, as the Member Secretary. The TAC members comprised representatives from the Ministry of Statistics and Programme Implementation, Registrar General of India, Planning Commission, Social Sector Ministries, academic institutions such as Indian Statistical Institute and International Institute of Population Sciences, a few of the women economists who had worked on these indicators in 1996 and representatives of UNDP **(Annexures 2 and 3).**

The terms of reference of TAC were as follows:

a) Develop the methodology for computation of GDI/GEM by deciding

- The list of socio-economic and developmental indicators for constituting the basket for computation of GDI and GEM separately.

- The Base Year i.e. the year from which the index is to be calculated.

- The weighting diagram for combining the indicators for computation of index.

- The formula for calculation of the index.

b) Examination and approval of the GDI/GEM prior to its release.

An iterative process was followed through three brainstorming TAC Workshops.

i) **The First Technical Advisory Committee Workshop** was held on 16th March, 2007 at IIPA. The following decisions were taken:

- Five categories of indices would be attempted at the national level
  a. Gender Development Index and Gender Empowerment Measure
  b. Development Index for males and females separately.
  c. Empowerment Measure for males and females separately.

d. Monitoring or Tracking Indicators to identify certain processes like infrastructure development, housing, etc.

e. Inequality indicators estimated by Gender

$$\text{Gap Index} = \frac{\text{Male Value - Female Value}}{\text{Male Value}}$$

with a value of 0 indicating no disparity, and a value of 1 indicating maximum disparity.

- There will be a short-term goal (Phase 1 and 2) and a long-term goal (beyond Phase 2). The current project is confined to dealing with the short-term goal of calculating GDI/GEM at National level and for the major Indian States. While this exercise will be confined to the National and State level based on available indicators, an attempt will be made (in Phase 2) to extend it to one or two districts in order to be able to recommend the absolute minimum list of indicators on which data must be collected and available at the district level. In the long term, compiling GDI/GEM for all districts of India can be considered.

- The project may recommend the desirable indicators for calculating GDI/GEM at National, State and District levels and identify data gaps.

- Only those indicators should be included for which data is available separately for males and females so that gender differentials are captured (Male/Female differences). The indicators used by Planning Commissions (for GEI) will also be considered while finalising the basket of indicators for compiling GDI and GEM.

- The dimensions used can be the same as used by UNDP but the indicators to measure these dimensions can be different. Also, the weightage given to the indicators and the goal posts

can differ from those used by UNDP so as to reflect Indian conditions.

- When the report is prepared, a section can be included to identify the critical gaps in data in respect of GDI and GEM.

A tentative list of over 100 indicators was prepared as part of the Concept Note and placed before the Technical Advisory Committee to facilitate identification of the indicators that could be considered in compilation of GDI, GEM and Tracking Indicators. After discussion, this was reduced to a list of 50 indicators for which the data availability was to be determined prior to deciding which of them would be used for computing the indices. The details are annexed at **Appendix 4.2.**

ii) **The Second Technical Advisory Committee Workshop** was held on 24th June, 2008 at IIPA. The following decisions were taken:

- Only two indices would be calculated: (i) GDI and (ii) GEM.

- GDI and GEM would be calculated at the National or All-India level, for States and for two districts.

- The estimates would be prepared at two time points: 1991 and 2001.

- The same three Dimensions used in UNDP's GDI and GEM would be maintained with one marginal change: Dimension 2 of GEM would be Economic and Social Participation and Decision-making instead of just Economic Participation and Decision-making.

- The same dimension ordering or listing would be used as for UNDP's GDI and GEM.

- The basket of indicators used to compile the index for each dimension would be changed as needed and enlarged.

- The title for the Report would be, "Gendering Human Development Indices: Recasting the GDI and GEM for India", as suggested by Prof. Devaki Jain.

- Data sources would be examined by the IIPA Technical team and where required, TAC members would be requested to facilitate procurement of data and provide suggestions.

Dimensions and Indicators of GDI and GEM as decided by the TAC members are given below but the final list would depend on data availability/suggestions.

Dimensions and Indicators for GDI

Dimension 1: A Long and Healthy Life
Indicators

i) IMR (Girls/Boys)

ii) Life Expectancy at age 1 (Girls/Boys)

iii) % Children underweight (Girls/Boys)

Dimension 2: Knowledge
Indicators

i) 7+ Literacy rate

ii) Primary, Secondary and Tertiary Combined Gross Enrolment Ratio

iii) Use of ICT (Internet + Radio + TV + Mass Communication)

Dimension 3: A Decent Standard of Living
Indicators

i) Share of Agricultural Income

ii) Share of Income in the Non-Agricultural Informal Sector

Dimensions and Indicators for GEM

Dimension1: Political Participation and Decision-making Power
Indicators

i) % Share of Parliamentary Seats

ii) % Seats of Legislature, *Zilla Parishads, Panchayat Samiti, Gram Panchayats,* Urban Local Bodies

iii) % Representation in Parliamentary Committees

iv) % Candidates in Electoral Process

v) % Central and State Council of Ministers

vi) % Participation in Governance Structures of Political Parties

vii) % Electors exercising the right to vote

viii) % Membership of Trade Unions

Dimension 2: Economic and Social Participation and Decision-making Power
Indicators

i) % Share in All India Civil Services

ii) % Participation in National Commissions

iii) % Participation in State Planning Boards and District Planning Committees

iv) % Senior Managers in the Corporate Sector

v) % Participation in Banks, Co-operative Banks and Financial Institutions

vi) % Share of Professionals (Judges, Lawyers, Doctors, Engineers, Journalists)

vii) % Participation in Decision-making Bodies of Journalists, Lawyers, etc.

Dimension 3: Power over Economic Resources

Indicators

i)   Female/Male Ownership of Assets such as land, dwelling, livestock, and productive assets

ii) Female/Male who Availed of Credit

iii) Female/Male Estimated Earned Income

The TAC Chairperson and Member Secretary were requested to:

- Assign weights to the indicators used for each dimension.

- Suggest the goal posts to be used.

- Discuss the framework, suggested dimensions, choice of indicators, indicators identified, weights and goal posts with four experts and request them for their expert comments and suggestions. The experts were Dr. Pronab Sen, Secretary and Chief Statistician, Ministry of Statistics and Programme Implementation (M/o S&PI); Prof. Amitabh Kundu, Jawaharlal Nehru University and Member National Statistical Commission; Dr. S.K. Nath, Director General, Central Statistical Organisation, M/o S&PI and Dr. J. Dash, Additional Director General, Social Statistics Division (M/o S&PI).

Subsequently, the indices would be compiled and a draft report prepared and presented to TAC and at a Multi-Stakeholder Workshop.

iii) The Third Technical Advisory Committee Workshop was held on 28th November, 2008 at IIPA.

The important decisions taken at the workshop were:

- The number of indicators for measuring each dimension should be small.

- Overlapping should be avoided as far as possible.

- There will be a strong relationship between some of the finalised indicators. While indicators may be used despite this, justification for use will be needed. The report should clearly state the reasons for selection of the final list of indicators. Correlation matrices can be used to curtail the number of indicators where the number is large.

- Data on indicators that have been dropped in the Third TAC workshop should be included in the explanations segment of the report.

- The income indicator estimated for GDI would also be used in estimating GEM.

- Equal weights would be assigned to all the indicators.

- The value to be used for epsilon (ε) would be 2.

- It would be desirable to estimate income earned share based on NSS Rural and Urban Wage Rate for agricultural and non-agricultural sector (combined) and (ii) Rural and Urban (Principal + Subsidiary workers) in agricultural and non-agricultural sector (combined).

- Indicators such as percentage of children underweight; use of ICT; % Central and State Council of Ministers; % representation in Lok Sabha and Rajya Sabha Committees, etc. would not be used in estimating the index but would be used in the explanations section of the report.

- Data gaps identified would be highlighted.

- Estimates of GDI and GEM would be compiled for two time periods, 2006 and 1996.

The detailed reports of the three TAC Workshops are at **Annexures 4, 5 and 6.** The final choice of dimensions and indicators was based on the need to use variables that are intuitively understandable and relevant, within the constraints imposed by availability of reliable data. The final list of Indicators within

Table 2.1: Gendering Human Development Indices: Recasting GDI for India - Dimensions and Indicators

Dimension 1: A Long and Healthy Life	
S. No.	Indicators
i)	Infant Mortality Rate
ii)	Life Expectancy at age 1
Dimension 2: Knowledge	
S. No	Indicators
i)	7+ Literacy Rate
ii)	Mean Years of Education or Combined Gross Enrolment Ratio (I-VIII)
Dimension 3: A Decent Standard of Living	
S. No.	Indicators
i)	Female/Male Estimated Earned Income Share

Table 2.2: Gendering Human Development Indices: Recasting GEM for India - Dimensions and Indicators

Dimension 1: Political Participation & Decision-making Power	
S. No.	Indicators
i)	% Share of Parliamentary Seats
ii)	% Share of Seats in Legislature
iii)	% Share of Seats in *Zilla Parishads*
iv)	% Share of Seats in *Gram Panchayats*
v)	% Candidates in Electoral Process in National Parties
vi)	% Electors exercising the right to vote
Dimension 2: Economic Participation & Decision-making Power	
S. No.	Indicators
i)	% Share in Service in IAS, IPS and Indian Forest Service
ii)	% Share of enrolment in medical and engineering colleges
iii)	Work Force Participation Rate (WFPR) in non-agricultural sector (if data available)
Dimension 3: Power over Economic Resources	
S. No.	Indicators
i)	% of Operational Land Holdings and Area Operated
ii)	% Females/Males with Bank Accounts in Scheduled Commercial Banks (with credit limit above Rs. 2 lakh)
iii)	Female/Male Estimated Earned Income Share as estimated for GDI

the dimension of GDI and GEM decided by the TAC members are in Tables 2.1 and 2.2.

Given below is a summary of the decisions taken in the three TAC workshops that enabled determination of these indicators:

- Only two indices would be calculated: (i) GDI and (ii) GEM. These would be calculated at the national or All-India level and for States/UTs. Calculation of GDI and GEM would be attempted for two districts to identify data gaps. The indices would be calculated for two time periods, 1996 and 2006.

- The index compiled should be simple, easily calculable and easy to interpret.

- For maintaining international comparability, the dimensions used would be the same as those used by UNDP.

- Equal weights would be assigned to all the dimensions. However, within dimensions, the indicators chosen, weights and goal posts would be more relevant to the Indian context.

- Critical gaps in data availability could be highlighted.

Given the constraints of data availability and based on the dimensions and indicators finalised at the third TAC workshop, the Project Team at the Indian Institute of Public Administration estimated HDI, GDI and GEM for India and the States/UTs for 1996 and 2006. The results were presented at a meeting chaired by Shri Anil Kumar, Secretary, MWCD and attended by senior officials of MWCD on 13th January, 2009. Subsequently, it was discussed at an MWCD-UNDP-IIPA Multi-Stakeholder Workshop held at IIPA on 20th February, 2009. Shri Anil Kumar,

Secretary, MWCD, inaugurated the workshop in the presence of Dr. Pronab Sen, Chief Statistician of India and Secretary (M/o S&PI), Shri B.S. Baswan, Director IIPA, Smt. Vijayalakshmy K. Gupta, Additional Secretary, MWCD and Ms. Sumeeta Banerji, Assistant Resident Representative, UNDP. Prof. Amitabh Kundu, Jawaharlal Nehru University and Member, National Statistical Commission chaired and led the discussion session along with a panel of experts comprising Dr. A.K. Shiva Kumar, UNICEF, Dr. Santosh Mehrotra, Planning Commission and Dr. Preet Rustagi, Institute of Human Development. The report was revised based on the valuable comments received from the panel and the large number of experts who attended the workshop and from the UNDP Human Development Report Office, New York. The detailed methodology is given in Chapter 3; the indices are presented in Chapters 4 and 5; Chapter 6 mentions the prominent data gaps and need for corrective action and Chapter 7 suggests the way forward.

Dimensions, Indicators, Goal Posts and Weights for HDI, GDI and GEM

3. Dimensions, Indicators, Goal Posts and Weights for HDI, GDI and GEM

The final list of indicators used was constrained by availability of data for India and for most States and Union Territories. Data gaps exist even for the indicators that were finally selected, thereby requiring adjustments. All the three indices, HDI, GDI and GEM were calculated for 1996 and 2006. The Dimensions and Indicators used for computing HDI, GDI and GEM are given below.

HDI and GDI: Dimensions and Indicators

HDI and GDI Dimension 1: 'A Long and Healthy Life'

Indicators

i)   Infant Mortality Rate

ii) Life Expectancy at age 1.

The negative index for infant mortality rate was converted to a positive index by subtracting the value of the index from 1.

HDI and GDI Dimension 2: 'Knowledge'

Indicators

i)   7 + Literacy Rate

ii) Mean Years of Education (15+ age group).

HDI and GDI Dimension 3: 'A Decent Standard of Living'

Indicator

i)   Estimated Earned Income per capita per annum.

GEM

GEM Dimension 1: 'Political Participation & Decision-making Power'

Indicators

i)   % Share of Parliamentary Seats (elected)

ii)   % Share of Seats in Legislature (elected)

iii) % Share of Seats in *Zilla Parishads* (elected)

iv)   % Share of Seats in *Gram Panchayats* (elected)

v)   % Candidates in Electoral Process in National Parties in the Parliamentary election

vi)   % Electors Exercising the Right to Vote in the Parliamentary election.

GEM Dimension 2: 'Economic Participation and Decision-making Power'

Indicators

i)   % Share of officials in service in Indian Administrative Service, Indian Police Service and Indian Forest Service

ii) % Share of enrolment in medical and engineering colleges.

GEM Dimension 3: 'Power Over Economic Resources'

Indicators

i)   % Female/Male with Operational Land Holdings

ii) % Females/Males with Bank Accounts in Scheduled Commercial Banks (with credit limit above Rs. 2 lakh)

iii) Female/Male Estimated Earned Income Share.

Rationale for Choice of Indicators Used for Computing HDI and GDI

Dimension 1: 'A Long and Healthy Life'

The UNDP HDR uses Life Expectancy at Birth (LEB) to measure the Dimension "long and healthy life" while the NHDR 2001 uses Life Expectancy at age 1 and Infant Mortality Rate (IMR). However, LEB only takes length of life into account and not the quality of life in terms of morbidity or mortality. A strong argument can be made for supplementing LEB with IMR as "male and female LEBs do not adequately highlight the real divergence in health conditions between the sexes that is starkly captured by proxies like the sex ratio and gender differentiated IMRs …"[21]. As IMR is a strong indicator of morbidity and mortality and pertains to infants in the age group 0 to 1, it was decided to use Life Expectancy at age 1 together with IMR instead of LEB. The negative IMR index is converted to a positive index by subtracting the value from 1.

As expected, these two indicators are negatively correlated. Equal weights were given to both indicators.

Dimension 2: 'Knowledge'

The UNDP HDR uses Adult Literacy Rate and the Combined Primary, Secondary and Tertiary Gross Enrolment Ratio to capture 'Knowledge', while NHDR 2001 uses 7+ Literacy Rate.

Two indicators have been used to capture this dimension in this report:

i) 7+ Literacy Rate

ii) Mean Years of Education for 15+ age group.

As expected, the two indicators for this dimension are positively correlated. Two thirds weight has been given to 7+ Literacy Rate and one third to Mean Years of Education on the same lines as adopted by UNDP for literacy and combined Gross Enrolment Ratio.

Since 'Knowledge' extends well beyond literacy and schooling, efforts were made to include the indicator "use of ICT based on use of the Internet, radio, TV, newspapers, phones etc." However gaps exist in availability of sex disaggregated data and its quality. Hence this indicator was dropped from the analysis.

Dimension 3: 'A Decent Standard of Living'

The UNDP HDR uses "estimated earned income" by males and females in Purchasing Power Parity (PPP) US$ to measure Dimension 3, 'A decent standard of living', while NHDR 2001 uses "per capita real consumption expenditure" adjusted for inequality. In this report, the Income Index is computed through estimation of Female/Male Earned Income Share. The estimation is based on Net State Domestic Product (NSDP) at constant prices and female and male wage rates for casual labourers applied to all female and male workers based on usual status (principal plus subsidiary status). It may be noted that National Data Systems are unable to realistically estimate the significant work done by women even within the "economic" sphere, as much of this is unpaid and is subsumed within "family" enterprises in the informal sector.[22] For this and

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[21] Vishwanathan, Renuka (2000), Measuring Development, Human Rights and Domestic Violence, International Association for Official Statistics Conference at Montreux.

[22] Devaki Jain and Malini Chand, (1982). Report on a Time Allocation Study: Its Methodological Implications, Indian Social Studies Trust, April; Devaki Jain (1996), "Valuing Work: Time as a Measure", *Economic and Political Weekly*, October 26, Maithreyi Krishnaraj and Amita Shah, Women in Agriculture, Academic Foundation, 2004; Aasha Kapur Mehta (2000), The Invisible Workers: Women's Unrecognised Contribution to the Economy, Manushi, November-December., MOSPI, (July 1998 – June 1999) Time Use Survey

a large number of other reasons, they remain statistically invisible. This is apart from the massive cooking, cleaning and caring burden borne by women.

NSS Work Force Participation Rates (while also underestimating women's work) have been consistently significantly higher than Census estimates in capturing the work force participation rate of women, with the exception of the 2001 Census. Hence Work Force Participation Rates and wage rates of casual labour [23] required for computing female and male earned income share were estimated on the basis of data from the NSS 50th quinquennial Round (1993-94) for 1996 and the 61st quinquennial Round (2004-05) for 2006.

Gender Empowerment Measure

What is empowerment? It is about "liberation of both men and women from oppression, where each can become a whole being regardless of gender, and use their fullest potential to construct a more humane society for all".[24] Further, "people must participate fully in the decisions and processes that shape their lives."[25] Additionally, "empowerment of …individuals has certain requisites that include resources (finance, knowledge, technology), skills training and leadership formation, democratic processes, dialogue, participation in policy and decision making and techniques for conflict resolution."[26] Charmes and Wieringa[27] consider awareness, choice, resources, voice, agency and participation as elements of empowerment.

Dimension 1: 'Political Participation & Decision-making Power'

The UNDP HDR uses 'Political participation and decision-making power', as measured by women's and men's percentage shares of parliamentary seats. However, the political arena and decision-making extend well beyond Parliament and decisions are taken at many levels of governance. In India, political equality to both men and women is guaranteed by the Constitution through the institution of adult franchise. Affirmative action through the 73rd and 74th Constitutional Amendments has had a tremendous impact on reducing inequalities in political representation in local governance. However, the representation of women at the highest level of decision-making has remained low [28].

Since women's participation in decision-making at all levels of governance is important as is their participation in deciding who will govern and take decisions on their behalf, we use the following indicators to estimate 'Political Participation & Decision-making Power'.

Indicators

i) % Share of Parliamentary Seats (elected)

ii) % Share of Seats in Legislature (elected)

iii) % Share of Seats in *Zilla Parishads* (elected)

iv) % Share of Seats in *Gram Panchayats* (elected)

v) % Candidates in Electoral Process in National Parties in the Parliamentary election.

vi) % Electors exercising the right to vote in the Parliamentary election.

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[23] Data on average wage rates is not readily available and has been generated especially by NCEUS for this report.

[24] Srilatha Batliwala (1994): 131 and Oxaal, Zoë, and Sally Baden (1997), "Gender and empowerment: definitions, approaches and implications for policy", *Bridge Development-Gender*, Report No.40, October.

[25] UN 1995b: 12 cited in Oxaal and Baden 1997 ibid.

[26] Sen and Grown cited in Oxaal 1997 ibid.

[27] Charmes, Jacques and Saskia Wieringa, (2003), "Measuring Women Empowerment: an assessment of the Gender-Related Development Index and the Gender Empowerment Measure", *Journal of Human Development*, 4 (3), November, pp 419-435.

[28] Aasha Kapur Mehta (1996), op. cit.

Dimension 2: 'Economic Participation and Decision-making Power'

UNDP uses an average of female and male shares of positions as legislators, senior officials and managers and female and male shares of professional and technical positions to capture this indicator. Female and male shares of positions as legislators have already been included in Dimension 1 and so have been excluded from Dimension 2. Due to data constraints we are limited to using the indicators given below:

Indicators

i)   % Share of officials in service in Indian Administrative Service, Indian Police Service and Indian Forest Service

ii) % Share of enrolment in medical and engineering colleges

Preferred indicators for inclusion would be membership of collectives (since groups both provide collective strength and are empowering) and membership of State Planning Boards. However, data on membership of, for instance, trade unions is not available at the State level and below. Information regarding men and women in State Planning Boards (SPBs) is not available. Searching each site gives a few names but since representation is also by position, information regarding name/gender is not available. While the Ministry of Human Resource Development publishes gender disaggregated data on enrolment in medical and engineering colleges, data for management colleges and for professional associations was not readily available.

Dimension 3: 'Power over Economic Resources'

The UNDP HDR uses estimated income earned by males and females in PPP US$ to measure the Dimension, 'Power over Economic Resources'.

Women's access to independent sources of income is positively related to their participation in household decision-making and the treatment they receive from family members. In most households, the male head of the family determines the use of incomes earned by the women. Indices based on share of income continue to be used for lack of an alternative, but income earned does not necessarily reflect access to resources.

Two critical resources are access to assets and to credit. Women have little access to land, dwelling, livestock, and productive assets. Gender-based data gaps are yet to be rectified for ownership of assets. This is an important source of empowerment and the estimates are likely to reflect significant disparities between men and women. Similarly, access to credit is an important index of empowerment in the context of persistent poverty and indebtedness, exacerbated by the burden of paying exorbitant rates of interest on the meagre sums borrowed from local moneylenders. Women traditionally have difficulty in accessing credit due to lack of ownership of land and assets that can be used as collateral. Availability of adequate and timely credit at institutional rates of interest makes a significant difference to the quality of life of the women and their families.[29] Gender disaggregated data is now available for bank accounts with credit limit above Rs. 2 lakh in scheduled commercial banks. However this is still not available for accounts with credit limit below Rs. 2 lakh. This places most of the population outside the purview of gender disaggregated data on access to credit.

In view of limitations in data availability, we use the following three indicators:

Indicators

i)   % Female/Male with Operational Land Holdings

ii) % Females/Males with Bank Accounts in Scheduled Commercial Banks (with credit limit above Rs. 2 lakh)

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[29] Mehta (1996) op.cit.

iii) Female/Male Estimated Earned Income Share per capita per annum

Female/Male Earned Income Share was estimated on the basis of NSDP at constant prices and female and male wage rates for casual labourers applied to all female and male workers (per thousand) based on usual status (principal plus subsidiary status). Data for the 50th quinquennial Round (1993-94) was used for estimating indices for 1996 and the 61st quinquennial Round (2004-05) for 2006.

Method of Construction of Indices: HDI, GDI and GEM

Calculation of both GDI and GEM closely follows the UNDP HDR method with marginal deviations in goal posts and weights.

The maximum and minimum values or goal posts are selected for each indicator used for estimating HDI and GDI. Table 3.1 lists the maximum and minimum goal posts that were applied to make each selected indicator scale free for estimating HDI and GDI.

The rationale for deciding the goal posts is as follows:

- The same goal posts need to be used for both the time points selected, i.e., 1996 and 2006, and also for the States and districts of India.

- Since the estimate of IMR was highest at 100 for males in Orissa in 1996, HDI and GDI were estimated using an IMR of 105 as the maximum. An infant mortality rate of 0 is desirable and this was applied as the minimum goal post.

- The goal posts used for Life Expectancy at age 1 were the same as those used by UNDP for Life Expectancy at Birth.

- The maximum goal post of 100 and minimum of 0 was applied to the 7+ Literacy Rate and is in conformity with the UNDP goal posts for literacy.

Table 3.1: Goal Posts for HDI and GDI

	Maximum	Minimum
'A Long and Healthy Life'		
Infant Mortality Rate	105 per 1000 live births	0 per 1000 live births
Life Expectancy at age 1 for HDI	85 years	25 years
Life Expectancy at age 1 for GDI	87.5 years for females and 82.5 for males	27.5 years for females and 22.5 for males
'Knowledge'		
7+ Literacy Rate	100 percent	0 percent
Mean Years of Education for 15+ age group	25 years	1 year
'A Decent Standard of Living'		
Female/Male Estimated Earned Income Share per capita per annum	Rs. 1,50,000	Rs. 100

- For Mean Years of Education, the minimum was taken to be 1 year since 1.2 years was the minimum estimated for females in Bihar in 1996. The maximum years of education was taken to be 25.

- The maximum estimate of income was around Rs. 1,47,000 per capita per annum for males in Chandigarh in 2006. This was rounded off to Rs. 1,50,000. The minimum was assumed to be Rs. 100.

The weights used for combining the three dimensions as well as the indicators within each dimension are presented in Table 3.2 for HDI and GDI and Table 3.3 for GEM.

The indicators identified for measuring each of the three dimensions, viz., 'A Long and Healthy Life', 'Knowledge' and 'A Decent Standard of Living', are made scale free and expressed as a value between 0

Table 3.2: Weights for Dimensions and Indicators - HDI and GDI

Dimensions/Indicators	Weights
Dimension 1: 'A Long and Healthy Life'	One - third
Infant Mortality Rate	Half for each indicator within the dimension
Life Expectancy at age 1	
Dimension 2: 'Knowledge'	One - third
7+ Literacy rate	Two thirds within the dimension
Mean Years of Education (15+ age group)	One third within the dimension
Dimension 3: 'A Decent Standard of Living'	One - third
Female/Male Estimated Earned Income Share	

Table 3.3: Weights for Dimensions and Indicator - GEM

Dimensions/Indicators	Weights
Dimension 1: 'Political Participation & Decision-making Power'	One - third
% Share of Parliamentary Seats (elected)	One sixth for each indicator within the dimension
% Share of Seats in Legislature (elected)	
% Share of Seats in *Zilla Parishads* (elected)	
% Share of Seats in *Gram Panchayats* (elected)	
% Candidates in Electoral Process in National Parties in the Parliamentary election.	
% Electors exercising the right to vote in the Parliamentary election.	
Dimension 2: 'Economic Participation and Decision-making Power'	One - third
% Share of officials in service in IAS, IPS and Indian Forest Service	Half for each indicator within the dimension
% Share of Enrolment in Medical and Engineering Colleges	
Dimension 3: 'Power over Economic Resources'	One - third
% Share of Operational Land Holdings	One third for each indicator within the dimension
% Females/Males with Bank Accounts in Scheduled Commercial Banks (with credit limit above Rs. 2 lakh)	
Female/Male Estimated Earned Income Share per capita per annum	

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Index Scale Free Value

$$= \frac{\text{Actual value - Minimum Value}}{\text{Maximum Value - Minimum Value}}$$

The scale free values of indices of a dimension are combined using the weights and the scale free dimension indices are calculated. The HDI is then calculated as the simple average of three scale free dimension indices.

GDI is estimated on the basis of the same three dimensions as the HDI but adjusts the average achievement in respect of these three dimensions to reflect the inequalities between men and women by applying a moderate penalty. The scale free index values are calculated separately for females and males for all the indicators, IMR, LE at age 1, Literacy 7+, Mean Years of Education (15+ age group) and log of Estimated Female/Male Earned Income.

After estimating the scale free index for females and males, the Equally Distributed Dimension Index is computed for each of the dimensions of GDI. As

the value of ε is taken as 2, the Equally Distributed Dimension Index becomes the weighted harmonic mean of the scale free index for females and males, the weights being the population share. The GDI is calculated as the simple average of the three Equally Distributed Dimension Indices.

If there is more than one scale free index within a dimension, these are combined using weights and the scale free dimension index for females and males is obtained. Subsequently, using the scale free dimen-

sion index for females and males, the Equally Distributed Dimension Index is calculated and then GDI.

In the case of GEM, from the percentage share, the Equally Distributed Equivalent Percentage (EDEP) is calculated by applying the penalty value of ε as 2 to the percent female and male shares in the identified area, with weights being the female and male population share. This is actually the weighted harmonic mean of percentage shares with population shares as the weights.

The EDEP of a dimension is then indexed to an ideal value of 50, i.e., the EDEP is divided by 50. If there were perfect equality between women and men, the indexed EDEP would equal 1. All indexed EDEPs within a dimension are averaged using weights to get the indexed EDEP for that dimension. GEM is then calculated as the simple average of the three dimension indexed EDEPs. The detailed method of computation is given in **Annexure 7.**

The calculated indices of HDI, GDI and GEM for India and the States/UTs are presented in Chapters 4 and 5.