Spatial Scenario of Literate Life Expectancy at Birth in India
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Citation

Abstract
Measuring human quality of life is a challenging academic work. Human development index substantially captures the overall country level status on human welfare. However this index has some drawbacks. W. Lutz thus composed a simple index in 1995 combining life expectancy and literacy, called Literate Life expectancy (LLE). LLE can be calculated for subpopulations depending on availability of data. This paper captures LLE of major states of India and its gender difference at rural and urban level. We have tried to highlight the social development scenario of India and its major states by using this pure social indicator that intentionally does not use any economic measurement. The state scenario comprehensively depicts gender differentials in social development and it calls for implementing development measures more seriously in states like Haryana, Bihar, Rajasthan, Madhya Pradesh and Uttar Pradesh in order to reduce the gender gap. Being highly correlated with human development index, Literate Life Expectancy index proved to be a very clear and simple comprehensive measure of social development for different sub populations.

INTRODUCTION
Human skills are important factors of production. Skill can be measured in many different ways, but for a global comparative analysis, literacy skills and years of completed formal education are by far the most frequently used indicator. Nevertheless, it also has some limitations. Sometimes it is very complicated to summarize and analyze. So to overcome from these complications, we take a simplified single indicator of human capital and even more broadly of human development; is more appropriate for direct inter country or interstate or even more inter class comparisons. This indicator called literate life expectancy (LLE) gives the average number of years a man or a woman lives in the literate state by combining the basic social development aspects of life expectancy and literacy in one number. This indicator has been widely used to compare subgroups within one population, such as men and women or urban and rural residents. It is based on easily available data and can even be projected into the future, based on the population and education projection.

Education is generally assumed to have far-reaching benefits. At the individual level, better education is associated with better health, more economic opportunities, and greater autonomy, especially for women (Federici et al. 1993; Jejeebhoy, 1995). At the aggregate level, the educational composition of the population has long bee considered a key factor of economic institutional and social development (Benevot 1989; Bellw et al. 1992; Hadden and Lodon, 1996).

LLE was first developed by Wolfgang Lutz in 1995 as an indicator of social development and quality of life (Lutz 1994/95). The aim of this indicator is to look at a persons years of life but in a literate state. It can be interpreted as the “average number of years a man or woman lives in the literate state” based on age-specific mortality rates and age specific proportions literate computed using life table method. This indicator has several advantages compared to other social and human development indicators, such as HDI. Moreover LLE is probably the only social development indicator that can be projected into the future on the basis of other already accepted forecasts and thus illustrates both the path dependence of and realistic prospects of development. LLE has several advantages compared to other indicators of social development. LLE indicator is purely based on individual characteristics; literacy and mortality, and not on national accounts of Gross Domestic Product (GDP). Unlike GDP per capita, LLE can be readily measured for men and women separately which makes it very appropriate for gender-specific analysis. LLE can stand alone in its absolute value and does not require the more or less arbitrary assumption of an upper limit that changes over time. It is entirely based on clear, observable
individual characteristics. The application of this indicator at the national level can reveal the concealing inequalities within regional level. Thus, there is great potential for improving human development by better distributing social services and by accurately restructuring budget priorities.

OBJECTIVES
In the above context, the paper aims to understand the level of literate life expectancy (LLE) of India and its major states. The specific objectives are to assess LLE of India and its variation across major states, to understand the gender differentials in LLE by place of stay and to compare Human development index and LLE.

METHODOLOGY
The Literate Life Expectancy indicator is a numerical sum of social development. The systematic approach of LLE combines two basic aspects of human development: (1) the number of years a person lives, and (2) level of education. The LLE indicator evaluates the age-specific mortality rates and the age-specific proportion literates. The aim of this indicator is to look at a person’s years of life but in a literate state. The estimation of literate life expectancy follows the ordinary life table method (Ramakumar, 1986; Namboodiri and Suchindra, 1987; Srinivasan, 1998). The calculation of the LLE requires empirical data of the age-specific mortality rates (ASMR) and the age-specific proportions literate (ASPL). The estimation of the LLE has been calculated without any complex mathematical operation in a life table, which is used for summarizing the mortality experience of a population. The only new element is the weighted number of person-years at each age by the age-specific proportions literate.

The data required for the analysis has been obtained from the National Family Health Survey (NFHS) – 3 (2005-06) and Sample Registration System report. From NFHS-3 proportion literate in the different age groups is considered; while proportion of death is taken from SRS report (2005). SRS provides information by sex and place of residence. The estimation of literacy life Expectancy (LLE) is as follows:

If the PLx is the age specific population literate then the literate person years lived in LLx is LLx * PLx. The Literate Life Expectancy or Lex is then obtained by dividing the cumulative literate person years (LTx) by the lx column.
That is- LTx = ∑LLx, Then Lex = LTx/lx

RESULTS AND DISCUSSIONS

LLE AT BIRTH IN INDIA AND MAJOR STATES
Literate life expectancy of India and major states is shown in the following graphs, which represents the varied social development levels in India. Kerala (63.4) has the highest and Bihar (26.4) has the lowest LLE in India. In all India level (36.4), LLE is not that appreciable compared to Kerala as most of the major states are performing poorly in LLE. When Kerala’s LLE at birth is 63.4 years, Bihar stands with 26.4 years with a substantial gap in female LLE. Uttar Pradesh (29.9) and Madhya Pradesh (30.0) are also lagging behind in this regard. Both the states depict low LLE in all ages. Rajasthan (28.2) and Bihar are very poorly performing states with a score of bellow 30 in LLE (appendix Table1).

Figure 1
Figure: 1- 6 Literate Life Expectancies at birth: India and Major States
GENDER DIFFERENTIALS IN LLE

Figure 7 shows the values of Literacy Life Expectancy at birth of major states of India by sex. LLE at birth is highest in Kerala (63.4). In Kerala for males, it is 62.0 years and for females it is 61.3 years. The lowest LLE is observed in Bihar (26.4 years) with a wide male female variation (male 35.4 and female 16.8). Maharashtra and Himachal Pradesh are more or less having the same LLE at birth for both genders (51.3 and 50.3 years). Nine states fit into the ranges of 40 to 50 years of LLE. However, in Uttar Pradesh, Madhya Pradesh, Orissa, Assam and Rajasthan both the mortality condition and literacy levels are poor and hence the LLE at birth is also very low (Appendix table. 2).

The difference between the male and female Literate Life Expectancy can be helpful to understand the gender gap. Figure 7 shows that the gender gap is highest in Rajasthan (19.0) and in Haryana (19.0). Bihar also shows a high level of gender variation. Only Kerala’s performance is exceptionally well in this regard. LLE for rural male and female in Kerala is the highest compared to other states (62.3 for males and 59.5 for females). The rural area in every state shows that male LLE at birth is low compared to the urban areas. In this respect gender gap in LLE for rural areas is the highest in Rajasthan (20.1 years) followed by Haryana (19.8), Bihar (18.9) and Uttar Pradesh (table 1). In urban areas, the LLE is highest in Kerala where the value of female LLE surpasses male LLE. It is 61.3 years for male and 62.9 years for female. In Assam, Tamil Nadu, Gujarat and Karnataka, the gender gap is less than 10 points. As a whole, the gap is less in urban parts over the rural areas with a substantial rural urban difference in Haryana, HP, Uttar Pradesh and Tamil Nadu.
**Human Development Index and LLE at Birth in India**

HDI of India 2005 highlights the very large gaps in well-being and life chances that continue to divide our increasingly interconnected world (Table 1). By looking at some of the most fundamental aspects of people’s lives and opportunities it provides a much more complete picture of a country’s development than other indicators, such as GDP per capita. Of the components of the HDI, only income and gross enrolment are somewhat responsive to short term policy changes. For that reason, it is important to examine changes in the human development index over time. The gender-related development index (GDI), introduced in Human Development Report 1995, measures achievements in the same dimensions using the same indicators as the HDI but captures inequalities in achievement between women and men. It is simply the HDI adjusted downward for gender inequality. The greater the gender disparity in basic human development, the lower is a country’s GDI relative to its HDI. India’s GDI value, 0.600 should be compared to its HDI value of 0.619. Its GDI value is 96.9% of its HDI value. Out of the 156 countries with both HDI and GDI values, 137 countries have a better ratio than India’s.

The key advantages of the LLE compared to other indicators of social development are as follows:

It has a clear interpretation in terms of the individual life cycle. It is not an abstract index on a relative scale, but rather is expressed in terms of individual years of life. Unlike GDP per capita LLE can be readily measured for men and women separately, which make it very appropriate for gender specific analysis. It can also be measured for other subgroups of the population. It can stand alone in its absolute value and does not require the more or less arbitrary assumption of an upper limit that change over time (as HDI does). This is important, as it enables comparisons to be made over longer time horizons that includes period of major structural changes. Finally, LLE is based entirely on observable individual characteristics. In this respect it can be seen as a benefit in terms of purity, rather than a deficiency.

However, HDI is a widely used indicator for measuring social development. So there must be a question that whether LLE can give the similar result as that of HDI? The following section of the paper has tried to understand the correlation of the two indices, i.e. HDI and LLE in Indian context.

**Human Development Index**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>HDI Value</th>
<th>LLE (years)</th>
<th>GDI Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iceland</td>
<td>0.968</td>
<td>0.968</td>
<td>0.968</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>0.873</td>
<td>0.873</td>
<td>0.873</td>
</tr>
<tr>
<td>3</td>
<td>Georgia</td>
<td>0.900</td>
<td>0.900</td>
<td>0.900</td>
</tr>
<tr>
<td>4</td>
<td>Australia</td>
<td>0.850</td>
<td>0.850</td>
<td>0.850</td>
</tr>
<tr>
<td>5</td>
<td>Luxembourg</td>
<td>0.819</td>
<td>0.819</td>
<td>0.819</td>
</tr>
</tbody>
</table>

To compare the LLE and HDI we assume that HDI does not change over the period 2001 and 2005 (table 2). According to the HDI & LLE ranking Kerala, Bihar, Uttar Pradesh,
Madhya Pradesh, Tamil Nadu get the same place. Rajasthan ranked 9 in HDI index but ranked 14 in LLE indicator. Haryana also loses its position in LLE indicator. Assam gained 7 points and it ranked 7 in LLE indicator. To see the correlation between the LLE & HDI ranking we do Spearman’s rank correlation and the coefficient is 0.775 which indicates a significant positive relation between them. The minor variation arises between the LLE and HDI is because of the fact that LLE is free from the economic parameter. It is strictly showing the social development, and thus those states that are performing relatively poorly in economic dimension have a downfall in HDI ranking. To mention in this regard, gross domestic product (GDP) per capita is a debatable indicator for a comprehensive measure of quality of life and development, as it fails to capture the distribution of income and wealth and it does not represent the other nonmaterial aspects of well-being, such as education and health.

**CONCLUSION**

Education holds the key to economic growth and social transformation. Though the major indicators of socioeconomic development viz., the growth rate of the economy, birth rate, death rate, infant mortality rate (IMR) and literacy rate, are all interconnected, the literacy rate has been the major determinant of the rise or fall in the other indicators. There is enough evidence in India to show that a high literacy rate, especially in the case of women, correlates with low birth rate, low IMR and increase in the rate of life expectancy. The recognition of this fact has created awareness on the need to focus upon literacy and elementary education programmes, not simply as a matter of social justice but more to foster economic growth, social well-being and social stability. Gender discrimination has been an ongoing feature of economic and social processes. It is much less apparent in health indicators such as longevity and infant mortality, and most evident in economic variables and in literacy. The life expectancy data indicate the improving health position of women relative to men. Yet, literacy level of women is appalling especially in rural India.

Measuring people’s quality of life emphasizes human well being and particularly issues of equity, poverty, and gender. In this context, this paper uses the latest indicator of social development, Literate Life Expectancy (LLE), which was introduced by Lutz in 1995. We have tried to highlight the social development scenario of India and its major states by using a pure social indicator that intentionally does not use any economic measurement but rather combines life expectancy and literacy in one number. The state scenario comprehensively depicts where the gender differentials is high. Therefore, it calls for development measures to be taken more seriously for states like Haryana, Rajasthan, Madhya Pradesh and Uttar Pradesh in order to reduce the gender gap. The Literate Life Expectancy index proved to be a very clear and simple comprehensive measure of social development at urban or rural level of spatial aggregation.

**APPENDIX**

**Figure 11**

Table 1: Literate Life Expectancy at birth, India, 2005

<table>
<thead>
<tr>
<th>State</th>
<th>Male</th>
<th>Female</th>
<th>Urban Male</th>
<th>Urban Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>52.7</td>
<td>56.2</td>
<td>52.7</td>
<td>56.2</td>
</tr>
</tbody>
</table>

**Figure 12**

Table 2: Literate Life Expectancy at birth in rural and urban areas across Major States, India

<table>
<thead>
<tr>
<th>State</th>
<th>Male</th>
<th>Female</th>
<th>Urban Male</th>
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</table>

**References**


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