

Growth of Literacy in India – A Trend Analysis

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*“So long as the millions live in hunger and ignorance,
I hold every man a traitor who having been educated
at their expense pays not the least heed to them”*

Swami Vivekananda

Illiteracy continues to be a social problem and it is obstructing all the development efforts even today. It is an established fact that if one single most important parameter of development is to be described, it is certainly literacy. Illiteracy is the inability to read and write. The consequences of illiteracy are very significant not only for the individuals themselves but also for the society at large. At the individual levels, illiteracy hinders from getting full information regarding warnings etc, prevents people from getting proper jobs leads to poverty, checks them from imparting education to their children and more significantly makes them lack self esteem which leads them to isolation. At the societal level, they face difficulties in functioning effectively in the knowledge driven world, face difficulties in community involvement and civic participation. Moreover, illiteracy causes an inferiority complex.

Literacy plays a significant role in the calculation of Human Development Index (HDI). HDI is calculated on the basis of a long and healthy life, as reflected in life expectancy at birth, the acquisition of education and knowledge, as reflected in the mean years of schooling (adjusted for out of school children) and literacy rate (age 7 years and above) and the standard of living and command over resources, as reflected in the monthly per capita expenditure adjusted for inflation and inequality. In 2010, India ranked 119 among 192 countries across the world, with a medium level HDI of 0.52, moving one notch higher as compared to 2005. According to United Nations Development Program (UNDP) data, it is among the top 10 movers in gross domestic product (GDP) growth. However, despite this, certain sections of society remain excluded, especially in terms of improvements in human

capabilities and entitlements (Source: India Human Development Report, 2011).

Understanding the concept of illiteracy and literacy

Illiteracy

Complete illiteracy means a person cannot read and write at all. Of equal relevance is the concept of functional illiteracy, which means an individual may have basic reading, writing and numerical skills but cannot apply them to accomplish tasks that are necessary to make informed choices and participate fully in everyday life. Such tasks may include: reading a medicine label, reading a nutritional label on a food product, balancing a cheque book, filling out a home loan application, reading a bank statement and comparing the cost of two items to work out which one offers the best value.

Poor literacy limits a person's ability to engage in activities that require either critical thinking or a solid base of literacy and numeracy skills. Such activities may include: understanding government policies and voting in elections, calculating the cost and potential return of a financial investment, analyzing sophisticated media and advertising messages, particularly for getting rich quick scams and assisting children with homework.

UNESCO defines functional illiteracy as "measured by assessing reading, writing and mathematical skills in the various domains of social life which influence individual identity and insertion into society. From this perspective, literacy involves not only reading and writing but also the acquisition of the skills necessary for effective and productive performance within society".

Illiteracy loses earnings and also limits employability avenues. Around the world, the impact of illiteracy on personal income varies but it is clear that earning potential is limited. Illiterate people earn 30%-42% less than their literate counterparts and do not have the literacy skills required to undertake further vocational education or training to improve their earning capacity.

Martinzer, R & Fernandez, P (2010) conducted a study on: The Social and Economic Impact of Illiteracy: Analytical Model and Pilot Study, UNESCO

reveals that the income of a person with poor literacy stays about the same throughout their working life. However, individuals with good literacy and numeracy skills can expect their incomes to increase at least two to three times what they were earning at the beginning of their careers. Young people who do not complete primary schooling are less likely to obtain good jobs, enough to avoid poverty” (Source: Cree, Kay & Steward, 2012).

Literacy

In India, literacy is calculated from the age population of 7 years and above. Earlier, it was calculated from the age population of 5 years and more. The Census definition of literacy is to read and write with ability any language. However, the National Literacy Mission defines literacy as acquiring the skills of reading, writing and arithmetic and the ability to apply them to one’s day-to-day life. Thus the goal of the National Literacy Mission goes beyond the simple achievement of self-reliance in literacy and numeracy of functional literacy. The achievement of functional literacy implies:

- Self-reliance in 3R’s
- Becoming aware of the causes of deprivation and moving towards amelioration of their condition by participating in the process of development.
- Acquiring skills to improve their economic status and general well-being.
- Imbibing values of national integration, conservation of environment, women’s equality and observance of small family norms etc.

The acquisition of functional literacy results in empowerment and a definite improvement in the quality of life. It helps to ensure the participation of the masses in sharing the benefits of the information era.

According to UNESCO the literacy is defined as:

- A literate person is one who can with understanding both read and write a short simple statement relevant to his everyday life.
- Literacy is not the simple reading of word or a set of associated symbols and sounds, but an act of critical understanding of men’s situation in the world.

- Literacy is not an end in itself but a means of personal liberation and development and extending individuals educational efforts involving overall inter-disciplinary responses to concrete problems.
- A literate person is one who has acquired all the essential knowledge and skills which enable him to engage in all those activities in which literacy is required for effective functioning in his group and community and whose attaining in reading, writing and numeracy make it possible to use these skills towards his own and his community's development (Source: National Literacy Mission, www.nlm.nic.in).

Analyzing these definitions, it is found that census definition is too simple and emphasizes merely on the ability of reading and writing any language. There is no focus on the functional aspects to get empowerment and quality improvement as well. While NLM definition of literacy not only emphasizes the skills part (reading, writing and arithmetic) but also their application in day to day affairs. It emphasizes more on the functional aspects of literacy to be aware from the causes of deprivation in order to participate in the development process. It includes skills for the economic improvement and general well being. It also includes inculcating values of national integration, conservation of the environment, women's equality and observance of small family norms. It also includes the participation and the benefits of the information era. Today's time is highly informative so literacy plays an important role in day to day affairs. According to UNESCO, literacy is the ability of reading and writing statement useful for everyday life. It focuses on critical understanding on men's situation in the world. Moreover, UNESCO treats literacy a way of personal liberation and development. It is an extension in the field of education to solve their problems. So, it focuses on the functional use of literacy for the benefits of their own and community as well.

Importance of Literacy

Kofi Annan, former Secretary General of the United Nations had quoted, "Literacy is a bridge from misery to hope. It is a tool for daily life in modern society. It is a bulwark against poverty and a building block of development, an essential complement to investments in roads, dams, clinics and factories. Literacy is a platform for democratization and a vehicle for the promotion of cultural and national identity....Literacy is, finally, the road to human progress and the means through which every man, woman and child can realize his or her full potential."

According to Gunar Mydral, "Asian Drama", Literacy opens up avenues for communication that otherwise remain closed. It is a prerequisite for the acquisition of other skills and the development of more aspects.

Literacy, an important tool for communication, learning and information, is a virtual precondition for an individual's evolution and national development. Research studies on human cognitive development have established that literacy enhances the critical faculties and enables to reflect on the existential reality in which they have been placed. It promotes objectivity, capacity for clear perception, thought as well as logical and coherent analysis. It promotes a sense of history and helps combine individuality with universalisation. In this sense, literacy can be regarded as an inalienable fundamental right.

Literacy is one of the major indicators of development in a society. It forms an important input in overall development of individuals enabling them to comprehend their social, economic, political and cultural environment better and respond to it appropriately. Literacy is a multidimensional concept. It is the first rung in the educational ladder.

Efforts made by UNESCO

Since its inception in 1946, UNESCO has been at the forefront of global literacy efforts and is concerned with keeping literacy high on the agenda regionally, nationally and internationally. According to UNESCO, Literacy is a human right, a tool of personal empowerment and a means for social and human development. Educational opportunities depend on literacy. Literacy is at the heart of basic education for all and essential for eradicating poverty, reducing child mortality, curbing population growth, achieving gender equality, ensuring sustainable development and peace and democracy. A good quality basic education equips pupils with literacy skills for life and further learning; literate parents are more likely to send their children to school; literate people are better able to access continuing educational opportunities and literate societies are better geared to meet pressing development.

At the first time, the World Congress of Education Ministers met in Tehran (capital of Iran), organized by UNESCO to discuss the problems of illiteracy at the international level on September 8, 1965. Since then this historic date is being observed as the International Literacy Day. Subsequently, the first international literacy day was celebrated on September 8, 1966. Since then this day is being celebrated each and every year and International Literacy

Day 2013 was the 44th in the series. On the eve of International Literacy Day 2013, the Director General of UNESCO, emphasized that Literacy is much more than an educational priority-it is the ultimate investment in the future and the first step towards all the new forms of literacy required in the twenty first century. International Literacy Day focuses on the empowering role of literacy and its importance for participation, citizenship and social development. At the eve of International Literacy Day, 2013 the President of India Pranav Mukherjee emphasized, "The success of our literacy programme ultimately depends on the willingness and cooperation of the people. I call upon each and every citizen of our country to take up this challenge and contribute in making our country free from the clutches of illiteracy."

By the initiative of UN, United Nations Literacy Decade and its international activities are being coordinated by UNESCO. By declaring the decade with the slogan of Literacy as Freedom, the international community recognized literacy as a human right to be actively promoted and defended. The decade addressed a renewed vision of literacy to encompass everyone's learning needs to improve literacy in all the contexts. The decade was celebrated during 2003-2012. Moreover, UNESCO also holds International Conference on Adult Education every 12 years.

Literacy Efforts: Overview

A number of efforts were made by the government as well as non-governmental organizations to liquidate illiteracy from the nation. The important programmes/policies have been summarized below:

1. Social Education This programme was implemented in the First Five Year Plan (1951-56). The major elements of this programme were literacy, extension, general education, leadership training and social consciousness of various development issues.

2. Gram Shikshan Mohim This movement for literacy in the rural areas was started in 1959 in Satara district of Maharashtra and was later extended to other parts of the state. The objective of the Mohim was to impart basic literacy skills within a period of about four months and by 1963, it spread to all the districts of the state. This programme lacked systematic follow up which consequently resulted massive relapse to illiteracy.

3. Farmer's Functional Literacy Project This inter-ministerial project was started in 1967-68 with two fold objective of farmer's training and functional literacy with the aim of popularization of high-yielding varieties of seeds through the process of adult education. The programme was confined to 144 districts of the country where nearly 8640 classes were organized for about 2.6 lakh adults.

4. Non-Formal Education In the beginning of the Fifth Plan, a programme of non-formal education for 15-25 age-group was launched. Despite, clarity about the scope, content and objective of the non-formal project, its understanding in the field was very limited and it was organized alike conventional literacy programmes.

5. Polyvalent Adult Education Centres Workers' Social Education Institutes and Polyvalent Adult Education Centres were reviewed by a group in 1977, which recommended adoption of Polyvalent Adult Education Centres in the adult education programmes for workers in urban areas. In pursuance of this decision, Shramik Vidyapeeths were set up in the states with an aim of improving the vocational skills and quality of life of the industrial workers and their family members migrated from rural to urban settings.

6. Functional Literacy for Adult Women (FLAW) This scheme was started in 1975-76 with the aim to enable illiterate adult women to acquire functional skills along with literacy in order to promote better awareness of health, hygiene, child-care practices and to bring about attitudinal changes. The target age group was 15-45, with greater attention to those in the 15-35 age group. This scheme was implemented in the experimental ICDS project areas and 300 ICDS projects were sanctioned till 1981-82 and FLAW scheme was also sanctioned along with this scheme. Later on due to the constraint of resources, the Planning Commission terminated this scheme in ICDS project areas.

7. National Adult Education Programme (NAEP) The first nation-wide attempt at eradication of illiteracy was made through the National Adult Education Programme on October 2, 1978 with the aim of educating 100 million non-literate adults in the age group of 15-35 years within a time frame of five years. The objectives of the NAEP were not merely to impart literacy in the conventional sense but also to provide learners functional awareness which were conceived as three integral components of the skills of reading, writing and arithmetic. Functionality implied the ability to utilize and apply

the skills acquired with a view to promote efficiency of the neo-literate. As against the target of 100 million, a total of 44.22 million learners were enrolled in adult education centres in different years up to March 1988.

8. Rural Functional Literacy Project (RFLP) This was a major centrally sponsored scheme started in 1978 for rural areas. 144 Farmers' Functional Literacy Projects and 60 Non-Formal Education Projects were merged into it. Subsequently after adding some more projects, the number of projects throughout the country in 1987 were 513, each having upto a maximum number of 300 adult education centres and each centre having 25-30 learners.

9. State Adult Education Programme (SAEP) The states also similarly took up centre based projects under the state plan funds on the lines of Rural Functional Literacy Projects.

10. Adult Education through Voluntary Agencies To ensure greater participation of voluntary agencies, the Central Scheme of Assistance to Voluntary Agencies was revived in April 1982. Under this scheme, registered societies were sanctioned centre-based projects for functional literacy and post literacy, where they were allowed to run projects in a compact area. Today there are a number of voluntary organizations in the country working in the field of literacy in their own ways.

11. National Literacy Mission (NLM) NLM was set up on May 5, 1988 by the then Prime Minister of India Rajiv Gandhi to impart a new sense of urgency and seriousness to adult education. After the success of the areas specific, time bound, voluntary based campaign approach first in Kottayam city then in Ernakulum district in Kerala in 1990, the NLM had accepted the literacy campaigns as a dominant strategy for eradication of illiteracy. The creditable performance of the NLM received international recognition when it was awarded the UNESCO Noma Literacy Prize for 1999. NLM has been awarded the Nehru Literacy Award for the year 1999 by the Indian Adult Education Association, New Delhi for its outstanding performance in the field of literacy and adult education. Ever since its inception, the National Literacy Mission has taken measures to strengthen its partnership with NGOs and to evolve both institutional and informal mechanisms to give voluntary organizations an active promotional role in the literacy movement. NLM was continued till the ninth and tenth five year plans. By the end of Tenth Five Year Plan (March 2007), NLM had covered 597 districts under Total Literacy Campaign(TLC),

485 districts under Post Literacy Programme (PLP) and 328 districts under Continuing Education Programme (CEP). As a cumulative outcome of these efforts, 127.45 million persons became literate, of which 60% learners were females, while 23% learners belonged to Scheduled Castes (SCs) and 12% to Scheduled Tribes (STs).

12. Saakshar Bharat Mission This mission was launched on the International Literacy Day, 8th September 2009 with a focus on women in general and disadvantaged groups in particular. The mission goes beyond the '3' R's (i.e. Reading, Writing & Arithmetic); for it also seeks to create an awareness of social disparities and a person's deprivation on the means for its amelioration and general well being. The Central and State Governments, Panchayati Raj Institutions, NGOs and Civil Society need to work in unison to realize the dream of creating a literate India. This scheme will cover all the 365 districts from 26 States/Union Territories in the country having adult female literacy rate below 50% according to 2001 census. The total target of the mission is to cover 70 million adults (60 million females and 10 million males) in the age group of 15 years and above. The Mission aims to reduce gender and other disparities in providing basic education in the country.

Status of Literacy in India

In 1951, the literacy rate was 18.33% for persons, 27.16% for males and 8.86% for females. The literacy rates during 1961-2011 have been shown in the following table:

| S. No. | Census Year | Persons | Male | Female | Urban areas | Rural areas |
|--------|-------------|---------|-------|--------|-------------|-------------|
| 1 | 1961 | 28.30 | 40.40 | 15.35 | 54.43 | 22.46 |
| 2 | 1971 | 34.45 | 45.96 | 21.97 | 60.22 | 27.89 |
| 3 | 1981 | 43.57 | 56.38 | 29.76 | 67.20 | 36.00 |
| 4 | 1991 | 52.21 | 64.13 | 39.29 | 73.08 | 44.69 |
| 5 | 2001 | 64.84 | 75.26 | 53.67 | 79.92 | 58.74 |
| 6 | 2011 | 73.0 | 80.9 | 64.6 | 84.1 | 67.8 |

Note: Literacy rates for 1951, 1961 and 1971 Censuses relate to population aged five years and above. The rates for the 1981, 1991, 2001 and 2011 Censuses relate to the population aged seven years and above. The 1981 literacy rates exclude Assam where the 1981 Census could not be conducted. The 1991 Census literacy rates exclude Jammu & Kashmir.

The table above reveals that the literacy rate has quadrupled from 1951 to 2011. Despite such improvement, 27% people of the country are still illiterate. If we look at a gender wise distribution, nearly 20% males are illiterate while nearly one third females are still illiterate as per 2011 census. If we compare the literacy rates of males between 1951 and 2011, it has trebled while of females, it has increased sevenfold.

The total growth in literacy rates is 54.67% from 1951 to 2011. If we look at an annual average growth of literacy rate during 1951 to 2011, it is 0.91% per annum. If we look at gender distribution, the growth for males is 53.74% during 1951 to 2011 which implies that the growth rate is 0.90% per annum. The growth rate for females is 55.74% which implies that the growth rate is 0.93% per annum.

Regarding regional literacy rates, during 1961 to 2011, literacy rates in rural areas has trebled while in urban areas, it became more than 1.5 times during same period which reveals that growth in rural areas is double than urban areas.

Statistical Analysis of Literacy Growth

The nature of literacy growth can be analyzed by linear regression method in the following way:

Gender wise

If we look into the trend of growth in gender wise (male-female) literacy rates and applying the least square method to obtain the parameters of the line $y = a + b t$, where y =literacy rates for persons, t = time in years, we obtain estimates of a and b as $a=17.06$, $b=9.24$, yielding the line

$$y=17.06+9.24 t \text{————— (1)}$$

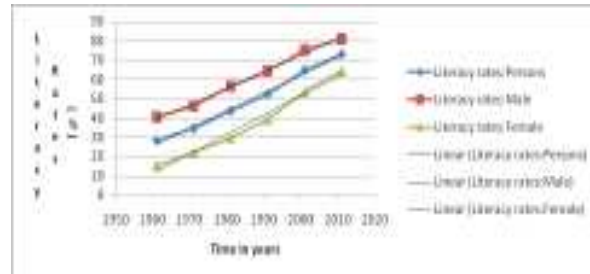
Similarly line for predicting the literacy rate for males is obtained as

$$y=30.68+8.52t \text{————— (2)}$$

Similarly line for predicting the literacy rate for females is obtained as

$$y=2.35+10.03t \text{————— (3)}$$

Equations (1), (2) and (3) are graphically represented in the following figure.



On this pattern, we may forecast the literacy rates for persons, males and females for the year 2021 by putting $t=7$ ($t=1$ to 6 is taken for the years from 1961 to 2011) in equation no. 1, 2 and 3 respectively. Thus we obtain for persons $y=81.74$ from equation no. 1, for males $y=90.32$ from equation no. 2 and for females $y=72.56$ from equation no.3.

So, by this method we can predict that in 2021, the literacy rates will be 81.74% for persons, 90.32% for males and 72.56% for females. Similarly, we can predict the literacy rates for any future year.

Region wise

If we look into the trend of growth in regional (urban-rural) literacy rates and applying the least square method to obtain the parameters of the line $y=a+ b t$, where y =literacy rates for persons, t = time in years, we obtain estimates of a and b as $a=17.06$, $b=9.24$, yielding the line

$$y=17.06+9.24 t \text{-----} (4)$$

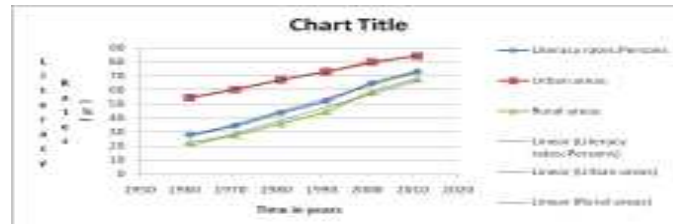
Similarly line for predicting the literacy rate for urban areas is obtained as

$$y=48.48+6.1 t \text{-----} (5)$$

Similarly line for predicting the literacy rate for rural areas is obtained as

$$y=10.14+9.37 t \text{-----} (6)$$

Equations (4), (5) and (6) are graphically represented in the figure on next page.



On this pattern, we may forecast the literacy rates for persons, urban and rural areas for the year 2021 by putting $t=7$ ($t=1$ to 6 is taken for the years from 1961 to 2011) in equation no. 4, 5 and 6 respectively. Thus we obtain for persons $y=81.74$ from equation no. 4, for males $y=91.18$ from equation no. 5 and for females $y=75.73$ from equation no.6.

So, by this method we can predict that in 2021, the literacy rates will be 81.74% for persons, 91.18 % for urban areas and 75.73% for rural areas. Similarly, we can predict the literacy rates for any future year.

The above analysis reveals that the nature of literacy growth is linear (not exponential). It means that the growth is occurring at a slow pace.

Future Projections of Literacy

According to the 2011 census, the literacy rate is 73%. In order to calculate the time period to achieve 100% literacy, we apply time series analysis

$$P_n = P_0 (1 + R/100)^n$$

Where $P_n = 100$ (literacy to be achieved), $P_0 = 73$ (present literacy)

$r = \text{rate} = 8.16$ (difference in literacy rates between 2011 and 2001)/10 = 0.816

Putting these values in the above equation and solving,

We get $n = 38.73$

This means that for achieving 100% literacy, it will take nearly 39 more years from 2011, if all the conditions remain the same in future. Thus India can achieve total literacy in year 2050. Moreover, India will take more than 100 years after independence to become independent from illiteracy.

Status of Illiteracy

International level

According to the UNESCO Institute for Statistics (UIS), the adult literacy rate is 84.1%. The UIS collects data on youth and adult literacy through its annual survey on literacy and educational attainment. Adult literacy rates concern the population groups aged 15 years and older, while youth literacy rates cover the populations between the ages of 15 to 24 years.

a. Global literacy rates and population numbers for adults and youth, 2011

| Parameter | Percentage/Population |
|---|-----------------------|
| Adult literacy rate, total | 84.1% |
| Adult literacy rate, male | 88.6% |
| Adult literacy rate, female | 79.9% |
| Adult illiterate population, total | 773.5 million |
| Adult illiterate population, female share | 63.8% |
| Youth literacy rate, total | 89.5% |
| Youth literacy rate, male | 92.2% |
| Youth literacy rate, female | 86.8% |
| Youth illiterate population, total | 123.2 million |
| Youth illiterate population, female share | 61.3% |

Source: UNESCO Institute for Statistics, Adult and Youth Literacy, UIS Fact Sheet, 2013

The Table above reveals that, 15.9% adults are illiterate at the international level. If we look at gender distribution, 11.4% male adults are illiterate while 20.1% female adults are illiterate. 773.5 million adults are illiterate in the whole world in which 63.8% females are illiterate. 10.5% youth are illiterate at the international level. 7.8% youth males are illiterate while 13.2% youth females are illiterate. 123.2 million youth are illiterate at the world level in which 61.3% females are illiterate.

b. Global adult illiterate population

There is 773.5 million adults are illiterate at the global level.

Global adult illiterate population by country, 2005-2011

| | |
|----------------------------------|---------------|
| World total illiterate | 773.5 million |
| India | 37% |
| Indonesia | 2% |
| Brazil | 2% |
| Egypt | 2% |
| Ethiopia | 3% |
| Nigeria | 5% |
| Bangladesh | 6% |
| Pakistan | 6% |
| Democratic Republic of the Congo | 2% |
| China | 7% |
| Rest of the world | 28% |

Source: UNESCO Institute for Statistics, Global Literacy Profile 2011

It is noteworthy from the above table that 37% of the world's illiterate adults live in India. 50% of the world's illiterate adults live in India, China and Bangladesh. 10 countries (India, Indonesia, Brazil, Egypt, Ethiopia, Nigeria, Bangladesh, Pakistan, Democratic Republic of the Congo and China) are the home to 72% adult illiterate population of the world.

National level

a. State wise Statement of Population, Literates and Illiterates of Age Group 7 and above (Census 2011)

| Sl. No. | India/State/Union Territory | Population | Literates | Illiterates |
|---------|-----------------------------|------------|-----------|-------------|
| 1 | India | 1046091423 | 763498517 | 282592906 |
| 2 | Jammu & Kashmir | 10522397 | 7067233 | 3455164 |
| 3 | Himachal Pradesh | 6086704 | 5039736 | 1046968 |
| 4 | Punjab | 24667119 | 18707137 | 5959982 |
| 5 | Chandigarh | 936016 | 805438 | 130578 |
| 6 | Uttarakhand | 8730478 | 6880953 | 1849525 |
| 7 | Haryana | 21970741 | 16598988 | 5371753 |
| 8 | NCT of Delhi | 14775487 | 12737767 | 2037720 |

| | | | | |
|----|---------------------------|-----------|-----------|----------|
| 9 | Rajasthan | 57898933 | 38275282 | 19623651 |
| 10 | Uttar Pradesh | 169021010 | 114397555 | 54623455 |
| 11 | Bihar | 84965488 | 52504553 | 32460935 |
| 12 | Sikkim | 546466 | 444952 | 101514 |
| 13 | Arunachal Pradesh | 1171539 | 766005 | 405534 |
| 14 | Nagaland | 1687431 | 1342434 | 344997 |
| 15 | Manipur | 2232136 | 1768181 | 463955 |
| 16 | Mizoram | 928675 | 848175 | 80500 |
| 17 | Tripura | 3215903 | 2804783 | 411120 |
| 18 | Meghalaya | 2398353 | 1785005 | 613348 |
| 19 | Assam | 26567446 | 19177977 | 7389469 |
| 20 | West Bengal | 80694649 | 61538281 | 19156368 |
| 21 | Jharkhand | 27598639 | 18328069 | 9270570 |
| 22 | Odisha | 36701024 | 26742595 | 9958429 |
| 23 | Chhattisgarh | 21883509 | 15379922 | 6503587 |
| 24 | Madhya Pradesh | 61817414 | 42851169 | 18966245 |
| 25 | Gujarat | 52662430 | 41093358 | 11569072 |
| 26 | Daman & Diu | 216313 | 188406 | 27907 |
| 27 | Dadar & Nagar Haveli | 292814 | 223230 | 69584 |
| 28 | Maharashtra | 99047816 | 81554290 | 17493526 |
| 29 | Andhra Pradesh | 75437975 | 50556760 | 24881215 |
| 30 | Karnataka | 53934264 | 40647322 | 13286942 |
| 31 | Goa | 1313934 | 1165487 | 148447 |
| 32 | Lakshadweep | 57218 | 52553 | 4665 |
| 33 | Kerala | 29933106 | 28135824 | 1797282 |
| 34 | Tamil Nadu | 64723198 | 51837507 | 12885691 |
| 35 | Puducherry | 1115095 | 957309 | 157786 |
| 36 | Andaman & Nicobar Islands | 339703 | 294281 | 45422 |

Source: IAEA Newsletter

Hypothesis: Whether proportion of literates and illiterates varies from state to state:

To verify whether their proportion of literates vary or remain same from state to state.

State wise growth in respect of literacy and to verify homogeneity of literacy, we apply chi square test, θ_i = literacy rate in the i^{th} state, $i=1 \dots 35$,

To test

$H_0: \theta_1 = \theta_2 = \dots = \theta_{35} = \theta$ where θ is unknown and can be estimated by

$$\hat{\theta} = 763498517/1046091423 = 0.73$$

Against H_1 : at least one of θ_i 's is different from the rest.

We compute

$$\chi^2 = \sum_{i=1}^{35} \left[\frac{(x_i - n_i \hat{\theta})^2}{n_i \hat{\theta} (1 - \hat{\theta})} \right] \quad \text{with (k-1) degree of freedom,} \quad (1)$$

Source : (Freund & Walpole, 1987)

$$x_i \sim B(n_i, \hat{\theta})$$

$$E(x_i) = n_i \hat{\theta}$$

$$V(x_i) = n_i \hat{\theta} (1 - \hat{\theta}), \text{ here, } i = 1, 2, \dots, 35$$

Let

$$Z_i = \frac{(x_i - n_i \hat{\theta})}{\sqrt{n_i \hat{\theta} (1 - \hat{\theta})}} \sim N(0, 1)$$

$$\hat{\theta} = \sum_{i=1}^{35} Z_i^2 \sim \chi_{34}^2$$

Using the data given in the above table we compute χ^2 from equation 1.

$$\chi^2 = 28858694.70 > \chi_{.01, 34}^2 = 56.061$$

Where $\chi_{.01, 34}^2 = 56.061$ (Source: Meyer, 1970)

Since, $\chi^2 > \chi_{.01, 34}^2$

Hence, H_0 is rejected at 1% level of significance. Thus the difference in literacy rates in different states is highly significant. It reveals that there is heterogeneity in the literacy rates. So, this heterogeneity needs to be addressed to achieve equitable and uniform growth of literacy.

Looking at the distribution of illiterate persons, BIMARU (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) has 44.47% of total illiterate population in the country. So, there is an urgent need to focus on these four states.

b. Household wise distribution of illiterates (Census 2011)

| Area Name | Number of households | Number of illiterates | Average number of illiterates per household |
|-----------|----------------------|-----------------------|---|
| India | 246692667 | 282592906 | 1.15 |
| Rural | 167826730 | 229524146 | 1.37 |
| Urban | 78865937 | 53068760 | 0.67 |

If we look at the distribution of illiterate persons in the households, the table above reveals that there are on an average 1.15 illiterate persons per household in the country. If we look at the geographic distribution, it is found that on an average, there are 1.37 illiterate persons per household in the rural areas while 0.67 illiterate persons per household in the urban areas.

c. Illiterate Population in India

(The Table presents the status of illiterate persons in absolute numbers)

| Parameter | Population/Percentage |
|--|-----------------------|
| Total illiterate persons in India | 282592906 |
| Uttar Pradesh has maximum number of illiterate persons | 54623455 |
| Lakshadweep has minimum number of illiterate persons | 4665 |
| Male illiterates in India | 102705594 |
| Female illiterates in India | 179887312 |
| Illiterate persons in rural areas | 229524146 |
| Illiterate persons in urban areas | 53068760 |
| Average number of illiterate persons per state/union territory | 8074083 |
| Average number of illiterate persons per district | 441551.4 |
| Average number of illiterate persons per household | 1.15 |

Conclusion

The paper presents empirical analysis of illiteracy in the country by analyzing the trend of growth of literacy rates in the country. It concludes that the growth is linear (not exponential) in nature meaning that the growth is slow. In addition to it, the paper projects the status of literacy in future and

concludes that it will take another 39 years to achieve 100% literacy in the country. The paper also examines the nature of growth of literacy in the states and reveals that it is not equitable and uniform. This analysis identifies key areas so there is an urgent need to focus on heterogeneity in literacy rates prevalent in different states, women and rural areas along with BIMARU states in the literacy drives to add momentum and accelerate the process of development. Moreover, literacy is the most significant indicator of development. On the contrary, illiteracy undermines efforts to eliminate a number of social ills like poverty, employment avenues, health efforts, corruption and participation in the democratic institutions. Furthermore, illiteracy is a threat in achieving Millennium Development Goals. However, in the presence of such a huge number of illiterate persons in India, development is impossible. This is a threat to the international efforts initiated by the United Nations and other organizations as well. Therefore, in addition to Saakshar Bharat Mission, some more significant efforts from government along with nongovernmental organizations are needed to realize the dream of literate society.

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