

## **India as the knowledge Economy**

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*India started improving its socio-economic conditions especially since it adopted its new economic policy in 1991. The growth of the economy was not so much encouraging during the first three decades of planning. The momentum was noticed in an accelerated pace during 1992-96 when the growth rate of the Indian economy was very high (6.7 percent). Then it slowed down and again recovered and it reached a climax in 2003-2004 when we observed a huge growth rate of 8.2 percent. In this paper we have highlighted some of the performances of the Indian economy in some areas such as agriculture, industry and the service sectors. In this context, we have elaborated the concept of knowledge economy with reference to its global competitiveness. We have sorted out the relation between education and human resource development in Indian context.*

### **1. Introduction**

For the last two decades India has been trying to improve its social and economic development. This has in fact been reflected in the faster growth of the economy. The growth rate of the economy, for example was only 3.5 percent for the three decades since 1950s. It started improving during 1980s and reached the growth rate 5.5 percent at the end of this decade. 1992-1996 was the period when India's growth rate was very high i.e. 6.7 percent. This was because of the fact that India initiated its new economic policy and the impact of such a policy was witnessed on the overall growth of the economy. But the growth slowed down during 1997-2001 and 2002-2003 when it fell to 5.5 percent and 4.4 percent respectively due to bad harvest in agriculture, because of poor rainfall. The 2003-2004 was the good year for India when there was a tremendous agricultural output and due to which India experienced a huge growth rate of 8.2 percent because of exceptional growth of agriculture during this year. This paper highlights some of socio-economic performances of the Indian economy during the reformed regime. It explores the importance of Knowledge in the context of global competitiveness. It also investigates the opportunities and challenges India currently faces.

### **2. Performances of the Indian Economy**

India for more than three decades has been trying to increase its income and standard of living of its population. To understand this we need to analyze India's performances in the growth of income and also the living conditions of the population with the help of supportive quantitative data. First of all we will present here the income scenario during the 1990s and 2000s India took up new economic policy during 1990s and as a result of which a lot of changes took place in the

spheres such as opening up of sectors to private investment, encouraging foreign direct investment, reducing hurdle of red tape, further liberalizing trade policy and exchange rate regime and reforming capital markets leading to an improved investment climate. As central controls have receded states have also acquired more freedom to maneuver and some states such as Andhra Pradesh, Karnataka and Maharashtra have shown tremendous progress in encouraging private investment.

Every country in the world today is touched by the forces of globalization and the rise of the knowledge economy. Well-equipped countries are able to take the fullest advantage of these forces for the creations of wealth and the well-being of the people. But for the less equipped developing countries, globalization and the knowledge economy may lead to poverty, unemployment, inequality and marginalization. The biggest challenge before most of the developing countries (including India) is to channelize the forces of globalization and the knowledge economy towards the alleviation of poverty and the empowerment of people so that they lead a decent standard of living.

In an agrarian economy as we have in most of the Asiatic countries, land is the most critical factor of all factors of production. Similarly, in an industrially advanced country natural resources such as coal and iron ore are the main resources for its productive activities. Similarly in knowledge economy 'knowledge' itself is the key resource. A knowledge economy is one in which all the sectors of the economy such as agriculture, industry and services amply use knowledge in their productive activities. It is at all not a new concept. In every sphere of life knowledge is used and the use of knowledge has been increasing especially since the industrial and agricultural revolution. The whole world has seen an explosion in the application of information and communication technologies in all areas of production, marketing and community life especially since the onslaught of globalization in early 1980s. Knowledge economy does have effect on each and every aspect of the economy, on goods and services and on every aspect of business chain from research and development (R&D) to production, marketing and distribution channels. The marginal knowledge or information is virtually Zero. Naturally knowledge is being greatly intensified in all sorts of economic activities.

India is one of the world's largest economies which have made tremendous efforts in the growth of its economy and society in the past three decades. After growing at about 3.5 percent from the 1950s to 1970s India had achieved a growth rate of about 5.5 percent during 1980s. It achieved an annual growth rate of 6.7 percent during the period from 1992-93 to 1996-97. This was possible only because of adoption of new economic policy in 1991 through which the economy was opened to the global competition. The growth of the economy went down drastically during 1997-98 to 2001-2001 to 5.5 percent and further to 4.4 percent in 2002-2003. This was mainly due to poor rain and its impact on agricultural output. But due to huge rain and good weather for agricultural output the growth of the economy was 8.2 percent during 2003-2004.

India undertake a series of reforms during 1990's majority of which are opening up more sectors to private investment, encouraging FDI, reducing red tape, further liberalizing trade policy and the exchange rate regime and reforming capital markets. As central cannot have receded states have acquired more freedom to progress their respective economies. In this way same states such as Andhra Pradesh, Karnataka and Maharashtra have made tremendous progress in encouraging private investment.

India is now poised to realize even faster growth. It is thus an opportune moment for India to make further progress towards a knowledge economy one that creates, disseminates and uses

knowledge to enhance its growth and development. The knowledge economy is often taken to mean only high-technology industries or information and communication technologies (ICT's). The concept may broadly be used to improve the productivity of agriculture, industry and services and increase overall welfare of the people. Great potential exist in India for increasing productivity by shifting from low productivity and subsistence activities in agriculture, informal industry, informal service activities to more productive modern sectors as well as to new knowledge –based activities which will greatly help ot reduce poverty and touch every member of society. India has potential to become a leader in knowledge creation and use.

India has many of the key in gradients for making this transition. It has a critical mass of skilled, English–speaking knowledge workers, especially in science and technology. It has a well functioning democracy. Its domestic market is one of the world's largest. It has a large and impressive Diaspora, creating valuable knowledge linkages and networks. This list goes on: macro economic stability, a dynamic private sector, institution of a free market economy a well-development financial sectors and a broad and diversified science and technology (S&T) infrastructure. In addition the development of ICT sector in recent years has been remarkable. With this India has become a global provider of software services. India's gross domestic product (GDP) by sectors 1997 to 2003 has been shown in the table 1 below.

**Table-1:** India's GDP by sector, 1997-2003 (percentage of total)

Sectors	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003
Agriculture	26.5	26.4	25.0	23.8	23.9	22.0
Industry						
a) Mining	2.5	2.4	2.4	2.3	2.2	2.4
b) Construction	5.0	5.0	5.1	5.2	5.1	5.3
c)Electricity, Gas or Water	2.5	2.5	2.5	2.5	2.5	2.4
d)Manufacturing	17.7	17.0	16.7	17.2	16.8	17.2
Services	45.8	46.6	48.3	48.9	49.5	50.8

*Source: Planning Commission of India, Government of India,2004.*

We can understand some interesting changes in the structural composition of the Indian economy. We see that agriculture's contribution has been declining from 26.5 percent in 1997-98 to 22.0 percent in 2002-03. Also we notice a decline in the manufacturing sector from 17.7 percent to 1997-98 to 17.2 percent in 2002-03. But there has been a significant improvement in the service sector.

**Table-2: Sector-wise GDP growth rates in India (%), 2008**

Sectors	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Agriculture *	-7.24	9.96	-0.05	5.92	3.76	4.55
Industry	6.79	6.00	8.51	8.02	10.63	8.09
a)Manufacturing	6.81	6.63	8.65	8.98	12.00	8.78
b)Mining/quarrying	8.84	3.09	8.15	4.87	5.70	4.75
C) electricity	4.75	4.77	7.90	4.68	5.98	6.27
Services	7.52	8.84	9.87	11.01	11.18	10.66
a)Construction	7.95	11.98	16.14	16.46	11.98	9.81
b)Trade, hotels **	9.44	12.01	10.69	11.51	11.82	12.02
c) Finance/Insurance +	7.98	5.58	8.69	11.41	13.92	11.79
d) Community ++	3.93	5.41	6.85	7.21	6.89	7.25
GDP at factor cost	3.84	8.52	7.49	9.40	9.62	9.03

\*Includes Forestry & Fishing

\*\* Includes transport and communication

+ Includes real estate & business services

++ Includes social & Personal services.

Source: Planning Commission of India, Government of India, 2009.

In 1997-98 service sectors sectoral contribution was 45.8 percent. It increased to 46.6 (nearly one percent within a year in 1998-99. This again rose to 48.3percent in 199-2000. There was a continuous increase in the GDP growth of this sector in 2001-2002 and 2002-2003. In 2001-2002 Indian service sector's sectoral contribution to GDP was 49.5 percent which again rose to 50.8 percent in 2002-2003.

The table-2 shows India's sector-wise growth rate (in percent) during 2002-2007. The table-2 shows that India witnessed negative growth rate twice in agriculture sector - one in 2002-2003 (-7.24 percent) and the next in 2004-2005 (-0.05 percent). This was due to bad harvest (bad monsoon). It was spectacular during 2003-2004 (9.96) due to good monsoon. The growth rates were more or less within the range 4 to 6 percentages during 2005-2006, 2006-2007 and 2007-2008. Industry showed a moderate growth rate during 2002-2007 within 6 to 10.5 percentage points. Service sectors growth rates were high if compared with agriculture and industry. Service sector growth rates were 7.52 percent in 2002-2003. This rose to 8.84 percent in 2003-04 and in 2004-05 it increased to 9.87 percent. During 2005-2006 and 2006-2007 it touched 11.01 percent and 11.18 percent respectively. This slightly came down in 2007-2008 to 9.81 percent. GDP at factor cost showed a remarkable upward trend from 3.84 percent in 2002-03 to 9.03 in 2007-08.

The Gross Domestic Product (GDP) in India increased at 5.3 percent in the first quarter of 2012 over the same quarter of the previous year. Historically from 2000 till 2012, India's GDP growth rate averaged 7.37 percent reaching an all time high of 11.80 percent in December 2003 and a record low of 1.60 percent in December 2002. The GDP growth rate provides an aggregated measure of changes in value of the goods and services produces by an economy. India's diverse economy encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries and a multitude of services. Services are the major source of economic growth accounting for more than half of India's output with less than one third of its labor force.

The economy has experienced an average growth rate of more than 7 percent in the decade since 1997 which lead to reduction of poverty by about 10 percentage points during the same period.

### **3. Knowledge Economy and its Global Competitiveness**

Today the whole globe is in the grip of a deep recession of uncertain length. It has, in fact, reduced the overall growth of the economies of the world irrespective of their economic structures (more advanced, advanced and developing) that lead to increase in poverty, helplessness and uncertainty. The impact of recession on the economy can be accessed through different perspective such as a fall in employment in technology and knowledge based industries, decline in investment in intangible asset and a decline of the financial services industry. In the case of international trade there has also been a decline in overseas market for the exports of knowledge services. Since the late 1970s countries like the UK have given too much attention to the knowledge- based industries i.e., knowledge services (e.g. Financial sectors). Naturally a huge investment has been made on this sector. This in fact has slowed down the expansion of the more traditional sector like the manufacturing sector. Thus, the expansion of knowledge services is at the exposure manufacturing sector. But it is a fact that there has been a tremendous expansion of knowledge base industrial sector during the globalised regime especially across the industrialized world.

Data on the UK economy (collected Office for National Statistics, UK for 1970-2008) show that between 1970 and 2008 consumer spending on knowledge economy services such as business, high tech, financial, telecom, health and education services has grown much faster than consumer spending on other services (spending on knowledge services went up 3.1 times while spending on other services went up 1.7times). One important thing that has been observed (Report on: Enterprise and the Knowledge Economy – Brinkley, 2008 – SEEDA –South East England Agency Development).

From Brinkley report it becomes clear that the increase in employment in SMEs in the UK over the past decade is very strongly associated with the growth of knowledge based industries.

The critical area for the knowledge economy (and the wider economy) will be what happens to 'knowledge based' intangibles which include R & D, design, software, brand equity, and human and organizational capital. Intangibles investment increased substantially from 1980 onwards driven by rising investment in head technologies and firm specific human and organizational capital. In 2004, investment in intangible assets exceeded that in physical assets by 40% across the British economy as a whole and income sectors such as manufacturing by nearly 100 % (HMT October, 2007 BERR Manufacturing Review 2008). Research has such similar results for the US, Finland and the Netherlands, major exception has been Japan. Japan did not experience the rapid increase in intangibles investment in the 1990s that took place elsewhere. However the ratio between tangible and intangible assets in Japan is exceptionally land. Intangible assets were worth only 30 percent of investment in tangible assets compared between 100 and 120 percent in other economics studied. (OECD 2008, Intellectual Assets and Value Creation). The UK data for 1970-2004 show that intangibles have been less affected by recession than physical assets.

### **4. Education and Human Resource Development**

Knowledge economy has a basic component which is education- formal and informal education. Educated and skilled persons can well create, share, disseminate and use knowledge properly and

justifiably, 'Hard' and 'Soft' skills are the key to the successful operation and execution of the knowledge economy 'Hard skills' traditionally denotes literacy and recently it also includes ICT competencies. 'soft skills' is an important element denoting communicating skills, problem-solving skills, creativity and teamwork. Previously, 'soft skills' were very much required and used by the managers of large business houses. But now-a-days these are used in good measure by all workers in the emerging knowledge economy.

Theoretical knowledge and learning are the two important components in a knowledge economy. Peter Drucker (2001, "The Next Society" – in *The Economist*, November 1) clearly mention that doctors, lawyers, teachers, accountants, and engineers are the true knowledge workers who, in fact, do possess both the 'theoretical' as well as 'learning' knowledge. Apart from this, Peter Drucker gives emphasis on the role of knowledge technologists. 'Knowledge technologists', according to him, are the computer technicians, software designers, analysts in technical labs, manufacturing technologists, and paralegals.

Knowledge economy calls for a dynamic education system starting from primary level to secondary and tertiary levels. All the three levels of education system need to be developed in such a manner that they will not only provide the foundation of learning but also develop technical knowledge, skills and encourage creative and critical thinking. These are essentially required to solve all sorts of problems and are key to innovation and are extended into a system of life long learning. Learning starts from the childhood and extends up to retirement. It thus covers both the formal and informal trainings. Formal training, we all know, is an acquired learning from schools, college, universities and all other educational institutions and informal training is acquired from on-the-job training, and the knowledge or training learned from family members or people in the community and the environment (Physical and others).

A large number of highly qualified and technically efficient people in India are contributing to the growth process efficiently domestically and internationally. But in terms of total Indian population their proportion is quite negligible. What India requires is a very large pool of human capital base capable of creating huge number of knowledge workers who can create competitiveness in the global economy.

We will now discuss India's educational and human resource advancements with the help of World Bank data, 2005. World Bank data show that India has made marginal improvement during 2000-2005.

India, as the World Bank data show, leads South Asia and Africa regions, but lags behind Poland, Russia and Korea. India is successful in the progress of literacy but its average years of schoolings 5.06 years [(greater than that of Brazil (4.88) but less than that of China (6.35), Poland (9.84), Russia (10.03) and Korea (10.84)]. In case of secondary and tertiary education also India is far lagging behind.

World Economic Forum (WEF) made a qualitative rankings and this shows that India is ahead of many of the above countries in terms of science and math education, internet access in schools and management education. One that disturbs India is its huge migration of skilled human resources abroad.

In the following paragraphs we will analyse in detail India's trends in educational and human resource development.

First, India has been trying since independence, particularly since mid – 1980s to improve its literacy with the introduction of various education programmes like universalisation of elementary education (I to VIII) through Sarva Siksha Mission (SSM) Right to Compulsory Education (RTE).

As a result there has been a considerable enhancement in literacy rate. The literacy rate rose from 52.2 percent in 1991 to 65.4 percent in 2001 which again rose to 74.04 in 2011. The literacy during different census as recorded has been exhibited in table-3 below.

**Table -3: Literacy Rates in India 1951-2011**

Year	Male literacy	Female literacy	Total	Male-Female Gap in Literacy Rate
1951	27.16	8.86	18.33	18.30
1961	40.40	15.35	28.30	25.05
1971	45.96	21.97	34.45	23.98
1981	56.38	29.76	43.57	26.62
1991	64.13	39.29	52.21	24.84
2001	75.85	54.16	65.38	21.59
2011	82.14	65.46	74.04	16.68

Source: *Census of India (Different Issues), Government of India*

- Note: 1. Literacy rate for 1951, 1961 and 1971 Censuses relate to the population aged seven years and above
2. The 1981 Literacy rate exclude Assam where the 1981 Census could not be conducted due to disturbed conditions.
3. The 2001 Census, literacy rates exclude entire Kachehh district, Morvi, Maliya Miyana and Wankaner talukas of Rajkot district of Gujarat state entire Kinnaur district of Himachal Pradesh where population enumeration of Census of India, 2001, could not be conducted due to natural calamities.

**Table-4: Crude Literacy in India by Sex: 1901 to 2011**

Census Year	Crude Literacy Rate			Change in Percentage Points		
	Males	Females	Persons	Males	Females	Persons
1901	9.83	0.60	5.35	-	-	-
1911	10.56	1.05	5.92	0.73	0.45	0.57
1921	12.21	1.81	7.16	1.65	0.76	1.24
1931	15.59	2.93	9.5	3.38	1.12	2.34
1941	24.9	7.30	16.1	9.31	4.37	6.68
1951	24.95	7.93	16.67	0.05	0.63	0.57
1961	34.44	12.95	24.02	9.49	5.02	7.35
1971	39.45	18.69	29.45	5.01	5.74	5.43
1981	46.89	24.82	36.23	7.44	6.13	6.78
1991	52.74	32.17	42.84	5.85	7.35	6.61
2001	63.24	45.15	54.51	10.2	12.98	11.67
2011	71.22	56.99	64.32	7.98	11.84	9.81

Source: *Census of India (Different Issues), Government of India.*

The improvement in crude literacy rate is phenomenal in post-independent India which is 48.22 percentage points. The increase is 49.69 percent for females and 46.32 percent for males.

Many steps have been taken by the government to reduce illiteracy. But there are several problems in reducing illiteracy. The first hindrance is the size and the diversity of Indian

population. Secondly, the conventional methods to teach an adult person how to read and write take relatively longer time. Thirdly, in spite of adopting various governmental measures drop out rates are very high. This is due mainly to poverty, parents' illiteracy, lack of awareness of the importance of education etc. Fourthly, the infrastructures are very poor in the schools. Many of India's primary and upper primary schools do not have a classroom for a class of students. Toilets for boys and girls are not found in many of the schools. Also there is a problem of pure drinking water in most of the schools. Finally, lack of trained teachers also is a constraint to reducing illiteracy in India.

Second, for creating as efficient human resource base in order to enhance the level of productivity and efficiency in every sphere of life it is of paramount importance to create a sound basic education system and for that matter a huge investment is needed in this system. Along with this emphasis on secondary and tertiary education is strongly demanded. The table-5 shows students' enrolment in primary, upper primary, secondary and tertiary stages in India.

**Table-5: Enrollment in India, 1990-91 and 2001-02 (Millions)**

Stages	1990-91	2001-02
Primary (grades 1-5)	97.4	113.9
Upper primary (grades 6-8)	34.0	44.8
Secondary (grades 9-12)	19.1	30.5
Tertiary	n.a.	9.2*

\* Includes more than one million students enrolled in open Universities.

n.a. = not available

Source: Education Statistics, Deptt. of Education, Government of India. ([www.education.nic.in](http://www.education.nic.in))

Tertiary education figures are taken from the UGC.

Table-5 shows that there has been a substantial growth in primary, upper primary, secondary and tertiary education in India during 1990-91, 2001-02 and 2011-12 in terms of increase in enrollment students at different stages. Though enrolment at all stages has gone up during 1990 – 91 to 2001 – 02, the huge enrolment gaps between primary and upper primary and between upper and secondary stages is a harsh point to the increase in the drop-out rate from primary to upper primary to secondary stages. These data bears testimony to the poor state of knowledge economy in India.

We will now look at the primary and secondary school education in India under different types of management. This is shown in Table-6 below.

**Table-6: Schools under Different Types of Management in India (%)**

Category of Schedule	Years	Types of Schools				
		Government Local	Local Body	Government & Local Bodies	Private Aided	Private unaided
Primary Schools (Grades 1-5)	1973-74	50.88	42.47	93.35	5.01	1.64
	1986-87	41.37	51.71	93.08	4.34	2.57
	1996-97	47.78	43.88	91.66	3.34	5.00
	2001-02	47.45	43.47	90.92	3.07	6.01

Upper Primary Schools (Grades 6-8)	1973-74	50.71	26.86	77.57	17.75	4.67
	1986-87	42.79	32.33	75.12	16.30	8.58
	1996-97	46.41	29.13	75.54	10.25	14.20
	2001-02	47.36	29.05	76.41	7.81	15.77
Secondary Schools (Grade 9-12)	1973-74	26.54	10.85	37.39	57.02	5.59
	1986-87	37.49	7.73	45.22	44.79	9.99
	1996-97	38.96	6.74	45.70	36.20	18.10
	2001-02	36.16	6.29	42.45	33.99	23.56

Source: Education Statistics, Department of Education, Government of India, 2002

According to the education statistics provided by the Government of India we notice that there are four types of schools – schools run by the government (Central, state or local government), schools run by the local bodies, schools run by the local management but largely funded by the government grants-in-aid and known as the aided schools and the schools run purely by private management and also funded privately and known as “private unaided”. The data presented in the above table show that among different categories of schools majority of schools especially the primary schools are run by the government (central, state and local level governments). But the percentage of the schools under this management category has been steadily declining since 1973. For example it was 93.35 percent in 1973-74. It came down to 90.92 in 2001-02. On the other hand, the number of schools under ‘Private aided’ and ‘Private unaided’ categories has been rising although their number together remains within the range 6-9 percent. In the upper primary category, the number of school ranges between 75 percent and 77 percent and in the case of private aided and private unaided together it ranges between 22 percent and 25 percent. The number of secondary schools ranges between 37 percent and 46 percent during the same period of time. But the number of private aided secondary schools has been slightly going down. It was 57 percent in 1973-74 and it came down to 34 percent in 2001-2002. The complete different picture is noticed in the case of private unaided secondary schools. This shows an upward trend. It was only 4.67 percent in 1973-74 and their came up 15.77 percent in 2001-2002.

### 5. Literacy Rate in EAG States

Table 7 shows the effective literacy rates for eight Empowered Action Group (EAG) states and non-EAGs states Data show that literacy rates for all the three categories i.e. person, male and female are higher in non-EAG states than those in the EAG states during 1991, 2001 & 2011. But the literacy rates in EAG States are higher for these categories during 2001-2011 than those in the non – EAG states in percentage points. Hence the EAG states are catching up with non-EAG states.

**Table-7: Effective Literacy Rate in EAG and Non EAG states**

Indian States/ India	1991			2001			2011		
	P	M	F	P	M	F	P	M	F
India	52.21	64.13	39.29	64.83	75.26	53.67	74.04	82.14	65.4
Non EAG States	60.09	70.34	49.2	70.64	79.25	61.53	78.24	84.76	71.4
EAG States	41.65	56	25.56	57.22	70.09	43.21	68.86	78.96	57.9

Source: Census of India, 1991, 2001, 2011

- Notes: 1. Figures for 1991 census do not include Jammu & Kashmir, as no census was held in the State.  
2. See notes behind 'Figures at a Glance'.

Table 8 indicates the male-female gap in effective literacy rate for EAG and non EAG States for Censuses of 1991, 2001 and 2011. The male female gap in literacy is declining at faster pace in EAG States. The decline is 5.92 percent in EAG States as compared to 4.38 percent in case of non-EAG States during 2001-2011.

**Table 8: Male –Female Gap in Effective Literacy Rate**

Indian States/ India	1991	2001	2011
India	24.85	21.59	16.68
Non EAG States	21.14	17.72	13.34
EAG States	30.32	26.89	20.97

Source: Censuses of India, 1991, 2001 and 2011

- Notes : 1. Figures for 1991 census do not include Jammu & Kashmir, as no census was held in the State.  
2. See notes behind 'Figures at a Glance'

The increase in the number of literates in all the EAG States is encouraging. Bihar (74.83 percent) tops the list followed by Jharkhand; (54.24 percent) ; and Uttar Pradesh (56.40 percent), Rajasthan (40.68 percent) and Chhattisgarh (39.61 percent) are in the middle and the third category states are Madhya Pradesh (38.73 percent). Uttarakhand (37.05 percent) and Orissa (36.68 percent).

**Table 9: Effective Literacy Trends in EAG States, 2001-2011**

Rank	India/ States Union Territories #	No of Literates in 2011	No of Literates in 2001	Absolute increase in the No. of Literates 2001-2011
1	2	3	4	5
	INDIA	77,84,54,120	56,07,53,179	21,77,00,941
1	Bihar	5,43,90,254	3,11,09,577	2,32,80,677
2	Jharkhand	1,87,53,660	1,17,77,201	69,76,459
3	Uttar Pradesh	11,84,23,805	7,57,19,284	4,27,04,521
4	Rajasthan	3,89,70,500	2,77,02,010	1,12,68,490
5	Chhattisgarh	1,55,98,314	1,11,73,149	44,25,165
6	Madhya Pradesh	4,38,27,193,	3,15,92,563	1,22,34,630
7	Uttarakhand	69,97,433	51,05,782	18,91,651
8	Orissa	2,71,12,376	1,98,37,055	72,75,321

Source: Census of India, 2001, 2011

- Notes : See notes behind 'Figures at a Glance'.

Table 10 represents population aged seven and above, the absolute number of literates in 2011 and their decadal absolute and percentage difference between 2001-2011. Data show that majority of children who attained the age of seven are literate.

**Table-10: Population aged 7 and above, literates in 2011 and their decadal difference and percentage decadal difference during 2001-2011**

State/ UT Code	India/State/ Territory Union	Population aged 7 and above in 2011	Decadal difference in population aged 7 and above during 2001- 2011	percentage decadal difference during 2001-2011
1	2	3	4	5
	India	1,05,14,04,135	18,65,04,094	2
01	Jammu & Kashmir	1,05,40,284	18,82,387	2
02	Himachal Pradesh	60,92,645	8,07,882	1
03	Punjab	2,47,62,666	35,75,496	1
04	Chandigarh	9,36,733	1,51,711	1
05	Uttarakhand	87,87,908	16,58,591	2
06	Haryana	2,20,55,357	42,46,330	2
07	NCT of Delhi	1,47,82,725	29,49,067	2
08	Rajasthan	5,81,16,096	1,22,59,910	2
09	Uttar Pradesh	16,98,53,242	3,52,79,949	2
10	Bihar	8,52,22,408	1,90,29,962	2
11	Sikkim	5,46,611	83,955	1
12	Arunachal Pradesh	11,79,852	2,87,755	3
13	Nagaland	16,94,621	5,737	-
14	Manipur	23,68,519	4,00,989	2
15	Mizoram	9,25,478	1,80,639	2
16	Tripura	32,26,977	4,64,220	1
17	Meghalaya	24,08,185	5,57,342	3
18	Assam	2,66,57,965	45,00,512	2
19	West Bengal	8,12,35,137	1,24,73,162	1
20	Jharkhand	2,77,28,656	57,39,654	2
21	Orissa	3,69,11,708	54,65,858	1
22	Chhattisgarh	2,19,56,168	46,77,281	2
23	Madhya Pradesh	6,20,49,270	1,24,83,461	2
24	Gujarat	5,28,89,452	97,50,839	2
25	Daman & Diu	2,17,031	79,405	5
26	Dadra & Nagar Haveli	2,93,657	1,13,366	6
27	Maharashtra	9,95,24,597	1,63,17,096	1
28	Andhra Pradesh	7,60,22,847	99,84,697	1
29	Karnataka	5,42,74,903	86,06,441	1
30	Goa	13,18,228	1,16,528	-
31	Lakshadweep	57,341	5,782	1
32	Kerala	3,00,65,430	20,17,202	-
33	Tamil Nadu	6,52,44,137	1,00,73,618	1
34	Pondicherry	11,16,854	2,59,668	3
35	A & N Islands	3,40,447	29,076	-

**Table- 11: Ranking of States and Union Territories by Literary Rate 2011**

Rank	Persons		Males		Rank
	India/State/union Territory	Literacy rate	India/State/union Territory	Literacy rate	
1	2	3	4	5	1
1	Kerala	93.91	Lakshadweep	96.11	1
2	Lakshadweep	92.28	Kerala	96.02	2
3	Mizoram	91.58	Mizoram	93.72	3
4	Tripura	87.75	Goa	92.81	4
5	Goa	87.40	Tripura	92.18	5
6	Daman & Diu	87.07	Puducherry	92.12	6
7	Puducherry	86.55	Daman & Diu	91.48	7
8	Chandigarh	86.43	NCT of Delhi	91.03	8
9	NCT of Delhi	86.34	Himachal Pradesh	90.83	9
10	Andaman & Nicobar Island	86.27	Chandigarh	90.54	10
11	Himachal Pradesh	83.78	Andaman & Nicobar Island	90.11	11
12	Maharashtra	82.91	Maharashtra	89.82	12
13	Sikkim	82.20	Uttarakhand	88.33	13
14	Tamil Nadu	80.33	Sikkim	87.29	14
15	Nagaland	80.11	Gujarat	87.23	15
16	Manipur	79.85	Tamil Nadu	86.81	16
17	Uttarakhand	79.63	Manipur	86.49	17
18	Gujarat	79.31	Dadra & Nagar Haveli	86.46	18
19	Dadra & Nagar Haveli	77.65	Haryana	85.38	19
20	West Bengal	77.08	Nagaland	83.29	20
21	Punjab	76.68	Karnataka	82.85	21
22	Haryana	76.64	West Bengal	82.67	22
23	Karnataka	75.60	Orissa	82.40	23
24	Meghalaya	75.48	Punjab	81.48	24
25	Orissa	73.45	Chhattisgarh	81.45	25
26	Assam	73.18	Madhya Pradesh	80.53	26
27	Chhattisgarh	71.04	Rajasthan	80.51	27
28	Madhya Pradesh	70.63	Uttar Pradesh	79.24	28
29	Uttar Pradesh	69.72	Assam	78.81	29
30	Jammu & Kashmir	68.74	Jharkhand	78.45	30
31	Andhra Pradesh	67.66	Jammu & Kashmir	78.26	31
32	Jharkhand	67.63	Meghalaya	77.17	32
33	Rajasthan	67.06	Andhra Pradesh	75.56	33
34	Arunachal Pradesh	66.95	Arunachal Pradesh	73.69	34
35	Bihar	63.82	Bihar	73.39	35

Kerala, Mizoram, Lakshadweep and Tripura have indeed shown a consistent improvement in effective literary rate for both the census of 2001 and 2011 census. Improvement in ranks was more than 5 points in 2011 census over 2001 in states like Tripura and Dadra and Nagar Haveli. States like Punjab, Chhattisgarh, Sikkim, Madhya Pradesh and Rajasthan have shown a decrease in rank by more than 4 points from 2001 census.

**Table 12: Ranking of States and Union Territories by Literary Rate, 2001- 2011**

State/ UT code	India/State/ Union Territory	Literacy rate		Rank		Decadal difference in literacy rate
		2001	2011	2001	2011	
1	2	3	4	5	6	7
	INDIA	64.83	74.04	-	-	9.21
1	Jammu & Kashmir	55.52	68.74	32	30	13.22
2	Himachal Pradesh	76.48	83.78	11	11	7.30
3	Punjab	69.65	76.68	15	21	7.03
4	Chandigarh	81.94	86.43	5	8	4.49
5	Uttarakhand	71.62	79.63	14	17	8.01
6	Haryana	67.91	76.64	19	22	8.73
7	NCT Delhi	81.67	86.34	6	9	4.67
8	Rajasthan	60.41	67.06	29	33	6.65
9	Uttar Pradesh	56.27	69.72	31	29	13.45
10	Bihar	47.00	63.82	35	35	16.82
11	Sikkim	68.81	82.20	17	13	13.39
12	Arunachal Pradesh	57.34	66.95	33	34	12.61
13	Nagaland	66.59	80.11	20	15	13.52
14	Manipur	69.93	79.85	22	16	9.92
15	Mizoram	88.80	91.58	2	3	2.78
16	Tripura	73.19	87.75	13	4	14.56
17	Meghalaya	62.56	75.48	27	24	12.92
18	Assam	63.25	73.18	25	26	9.93
19	West Bengal	68.64	77.08	18	20	8.44
20	Jharkhand	53.56	67.63	34	32	14.07
21	Orissa	63.08	73.45	26	25	10.37
22	Chhattisgarh	64.66	71.04	23	27	6.38
23	Madhya Pradesh	63.74	70.63	24	28	6.89
24	Gujarat	69.14	79.31	16	18	10.17
25	Damn & Diu	78.18	87.07	9	6	8.89
26	Dadra & Nagar Haveli	57.63	77.65	30	19	20.02
27	Maharashtra	76.88	82.91	10	12	6.03
28	Andhra Pradesh	66.64	75.60	21	23	8.96
29	Karnataka	60.47	67.66	28	31	7.19
30	Goa	82.01	87.40	4	5	5.39

31	Lakshadweep	86.66	92.28	3	2	5.62
32	Kerala	90.86	93.91	1	1	3.05
33	Tamil Nadu	73.45	80.33	14	14	6.88
34	Puducherry	81.24	86.55	7	7	5.31

Source: Census of India, 2001, 2011

### 6. Literary Rates by Gender

According to Census of India, 2011, Kerala has a literary rate of 93.91 percent (highest in India) followed by Lakshadweep (92.28 percent) and Mizoram (91.58 percent). Bihar's position is the last with the literary rate of 63.82 percent preceded by Arunachal Pradesh (66.95 percent) and Rajasthan (67.06 percent). Maharashtra ranks 2nd (82.91) among the major states followed by Tamil Nadu (74.04 percent). Jammu and Kashmir, Rajasthan, Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Bihar, Jharkhand, Orissa and Arunachal Pradesh and Assam have literary below the national average of 74.04 percent.

In terms of female literary Kerala ranks the first position. Rajasthan's female literary is the lowest that is 52.66 percent preceded by Bihar which is 53.33 percent. Male literary is highest in Lakshadweep (96.11 percent). Kerala ranks second in terms of male literary which is 96.02 percent. Male literary is the lowest in Bihar (73.39 percent) preceded by Arunachal Pradesh (73.69 percent).

### Effective Literary Rate: Gender Gap

The gender gap during 2011 census is 16.68 which was 21.59 during 2001 census. The decadal difference in literary rates for males and females stand at 6.88 and 11.79 percentage points respectively. This indicates a substantial improvement in literary among the females. The gender gap was higher than the national average in 12 states and Union Territories in Census 2001. It was below the national average for 23 states and Union Territories during the same period. During 2011, the gender gap in 11 states is higher than the national average. For 24 states the gender gap is below the same period. Meghalaya and Mizoram (North-Eastern states) and Kerala (Southern State) have shown a minimum gender gap both during 2001 and 2011. Gender differential in literary both at 2001 and 2011 censuses are huge in Rajasthan, Jharkhand, Chhattisgarh, Madhya Pradesh and Jammu & Kashmir. These states are in fact at the bottom in terms of achieving effective literary rate.

### 7. A Comparison of Effective Literary Rate with NSSO Data (64th Round)

During 2011 census the effective literacy stands at 74.04 percent. The NSSO (64th Round) reports this at 71.70 percent. The NSSO conducted its 64th Ropund Survey in 2007-08. The Male literacy gap between the census 2011 and NSSO survey (64th Round) is 1.64 percent i.e., the NSSO reports it at 82.14 percent. The female literacy gap is 3.16 percent i.e., NSSO reports it at 62.30 percent and the census 2011 at 65.46 percent. All the states/Union Territories have shown increases in literacy rate in the Census 2011 as compared to NSSO. The exceptions are the North Eastern States of Assam, Nagaland, Manipur, Mizoram, Meghalaya, Arunachal Pradesh and Sikkim. Daman and Diu also shows a lower literacy rate during 2011 census. The implication of the above analysis is that India is far behind attaining full literacy of its population. Efforts are, no

doubt being made to achieve the objective of full literacy, but many more things yet need to be done. This means that India has yet to make full use of the knowledge economy to boost the growth of its competitiveness.

The comparison of literacy rates of 2011 census with NSSO survey (64th Round) is shown below in table -13.

**Table-13:** Comparison of Literacy Rates of Census 2011 with NSSO survey (64<sup>th</sup> Round) by gender:

Sl. No.	India /State / Union Territory	Literacy rate			Literacy rate			Difference between 2011 census and National Sample Survey		
		2011 Census			National Sample Survey (64 <sup>th</sup> round)			National Sample Survey		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
1	2	3	4	5	6	7	8	9	10	11
	INDIA	74.04	82.14	65.46	71.70	80.50	62.30	2.34	1.64	3.16
1	Jammu & Kashmir	68.74	78.26	58.01	67.70	77.70	57.10	1.04	0.56	0.91
2	Himachal Pradesh	83.78	90.83	76.60	80.40	87.70	73.20	3.38	3.13	3.40
3	Punjab	76.68	81.48	71.34	76.10	81.30	70.40	0.58	0.18	0.94
4	Chandigarh	86.43	90.54	81.38	82.80	87.10	77.00	3.63	3.44	4.38
5	Uttarakhand	79.63	88.33	70.70	76.00	85.70	66.60	3.63	2.63	4.10
6	Haryana	76.64	85.38	66.77	73.50	82.90	62.70	3.14	2.48	4.07
7	NCT of Delhi	86.34	91.03	80.93	85.20	91.40	77.30	1.14	-0.37	3.63
8	Rajasthan	67.06	80.51	52.66	61.70	75.80	46.60	5.36	4.71	6.06
9	Uttar Pradesh	69.72	79.24	59.26	66.20	76.80	54.70	3.52	2.44	4.56
10	Bihar	63.82	73.39	53.33	58.10	69.90	45.00	5.72	3.49	8.33
11	Sikkim	82.20	87.29	76.43	83.90	88.70	78.50	-1.70	-1.41	-2.07
12	Arunachal Pradesh	66.95	73.69	59.57	70.50	76.20	64.30	-3.55	-2.51	-4.73
13	Nagaland	80.11	83.29	76.69	91.60	94.60	88.30	-11.49	-11.31	-11.61
14	Manipur	79.85	86.49	73.17	83.00	89.90	75.60	-3.15	-3.41	-2.43
15	Mizoram	91.58	93.72	89.40	95.90	97.00	94.80	-4.32	-3.28	-5.40
16	Tripura	87.75	92.18	83.15	78.40	83.10	73.40	9.35	9.08	9.75
17	Meghalaya	75.48	77.17	73.78	92.60	93.80	91.50	-17.12	-16.63	-17.72
18	Assam	73.18	78.81	67.27	83.80	89.10	78.00	-10.62	-10.29	-10.73
19	West Bengal	77.08	82.67	71.16	75.60	82.20	68.60	1.48	0.47	2.56
20	Jharkhand	67.63	78.45	56.21	64.60	76.40	51.40	3.03	2.05	4.81
21	Orissa	73.45	82.40	64.36	68.30	76.90	59.70	5.15	5.50	4.66
22	Chhattisgarh	71.04	81.45	60.59	71.00	80.50	61.00	0.04	0.95	-0.41
23	Madhya Pradesh	70.63	80.53	60.02	70.40	79.90	59.60	0.23	0.63	0.42
24	Gujarat	79.31	87.23	70.73	74.90	84.60	64.40	4.41	2.63	6.33

25	Damn & Diu	87.07	91.48	79.59	93.00	96.30	88.10	-5.93	-4.82	-8.51
26	Dadra & Nagar Haveli	77.65	86.46	65.93	72.50	87.10	51.50	5.15	-0.64	14.43
27	Maharashtra	82.91	89.82	75.48	80.90	88.20	73.40	2.01	1.62	2.08
28	Andhra Pradesh	67.66	75.56	59.74	63.50	72.30	54.90	4.16	3.26	4.84
29	Karnataka	75.60	82.85	68.13	71.20	79.30	62.90	4.40	3.55	5.23
30	Goa	87.40	92.81	81.84	82.40	87.60	77.20	5.00	5.21	4.64
31	Lakshadweep	92.28	96.11	88.25	91.20	96.40	85.80	1.08	-0.29	2.45
32	Kerala	93.91	96.02	91.98	93.90	96.20	91.80	0.01	-0.18	0.18
33	Tamil Nadu	80.33	86.81	73.86	80.00	88.00	72.30	0.33	-1.19	1.56
34	Puducherry	86.55	92.12	81.22	86.00	91.70	79.90	0.55	0.42	1.32
35	Andaman & Nicobar Islands	86.27	90.11	81.84	85.90	90.30	80.90	0.37	-0.19	0.94

Sources: Census of India, 2011 & NSSO (64<sup>th</sup> Round, 2007-08), Government of India

### 8. A Note on India's Traditional Knowledge

Traditional knowledge (TK) includes knowledge about traditional technologies of subsistence like tools and implements used previously or at present for hunting or agriculture by the indigenous or local communities. In most cases, there has not been documentation of traditional knowledge and it has been orally passed from person to person from time immemorial. In most cases traditional knowledge has come to us through stories, legends, folklore, rituals, songs and laws (Traditional Knowledge, Wikipedia). Traditional knowledge plays an important part in the daily lives of people of developing countries in matters of food security and health. Many international organizations such as world Intellectual Property Organisation (WIPO), International

Labour Organisation (ILO), United Nations Educational, Scientific and Cultural Organisation (UNESCO), Food and Agriculture Organisation (FAO), and World Health Organisation (WHO) and conventions such as Convention on Biological Diversity (CBD), the United Nations Conference on Trade and Development (UNCTAD) have come up with the issue of protection of traditional knowledge, bio-piracy and fair and equitable sharing of benefits arising out of utilization of traditional knowledge.

International community such as WIPO and UNESKO in 1981 sought to recognize and protect traditional knowledge through the adoption of a model law on folklore and in 1989 the FAO introduced the concept of Farmers' Rights into its International Undertaking on Plant Genetic Resources. The CBD also in 1992 emphasised the necessity of promoting and preserving traditional knowledge. In spite of such concerted efforts for the last three decades or so little has been effectively done on the preservation and conservation of traditional knowledge.

India, being a bio-diversity rich country has taken steps along with other countries for the protection and preservation of traditional knowledge at the national and international levels. In 1992 also the Convention on Biological Diversity (CBD), emphasized the importance of promoting and preserving traditional knowledge. Thus many developing countries who are the holders of traditional knowledge and international organizations campaigning for protecting TK are continuously pressing for the creation of an international organization which ultimately led to

the setting up of an Intergovernmental Committee on Intellectual Property and Genetic Resources Traditional Knowledge and Folklore in WIPO.

The preservation, protection and promotion of traditional knowledge and practices of local communities are extremely important for developing countries which play a critical role in their health care food security, culture, religion, identity, environment and ultimately in improving their trade and commerce. But it is a matter of great concern that this knowledge is largely used and patented by third parties without prior consent of traditional knowledge holders. It is seen that few of such benefits are being shared by the people of such local communities in which this knowledge originated and exists.

India has a rich traditional knowledge of ways and means practised to treat diseases afflicting people. A part of this traditional knowledge has been found in ancient classical and other literature. But this is not easily accessible to the general public. Documentation of this knowledge was felt very urgent in order to protect it from being misappropriated in the form of patents on non-original innovations. In 1999, the Department of Ayurveda, Yoga & Naturopathy, Unani, Sidha and Homeopathy (AYUSH) constituted a Task Force for establishing a Traditional Knowledge Digital Library (TKDL). The TKDL project was initiated in 2001. The purpose of TKDL is to provide information on traditional knowledge existing in the country, in languages and format understandable by patent examiners at International Patent Offices (IPOs). It is a collaboration project between Council of Scientific and Industrial Research (CSIR), Ministry of Science, AYUSH and Ministry of Health and Family Welfare, Government of India. TKDL involves documentation of traditional knowledge available in public domain from the exiting literature related to Ayurveds, Unani, and Siddha in digitized format. This documentation is done in English, French, German, Spanish and Japanese languages. It includes about 2.12 lakh medicinal formulations from 148 books and the database exists in 34 million A4 size papers. The government of India, on June 29, 2006, approved to provide the access of TKDL database to International Patent Offices, under Non-disclosure Agreement between CSIR and respective International Patent Offices.

The TKDL Access Agreements gave long-term implications on the protection and preservation of traditional knowledge and global intellectual property systems. This has also enhanced negotiating strengths of India and the developing countries at the international fora. The European patent office also appreciated the usefulness of this database. Many developing countries and international organizations such as South Africa, African Regional Industrial Property Organisation (ARIPO), Mongolia, Nigeria, Thailand, and Malaysia have come forward for creating their own TKDL-type database to protect their own traditional knowledge.

## **9. Conclusion**

We have seen that every country in the world today is influenced by the forces of globalization and the rise of the knowledge economy. Developed economies have been able to take the fullest advantage of these forces for the creations of wealth and the well-being of people. For the less equipped developing economies, globalization and the knowledge economy may lead to poverty, unemployment, inequality and marginalization. The challenge before these economies, including India, is to channelize the forces of globalization and the knowledge economy for the alleviation of poverty and the empowerment of people so as to enable them to live a decent standard of living. This calls for educational attainment of every citizen and human resource development through quality training and education.

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