Chapter-X

Conclusions, Findings and Recommendations

10.1: Conclusions

The knowledge, the ability to comprehend and utilize nature to our advantage contributes enormously to our growth and expansion processes. Knowledge and thus efficient utilization of knowledge are jointly contributing in our progress. Energy from wood and coal may be now regarded as primitive, even the utilization of potential difference of water flow into energy is superseded by nuclear energy. We have long been stepped into nuclear age. We want to develop commercial process to utilize sun ray. We are yet to imagine some other form of energy to substitute electricity. We have diluted the physical distance of communication and spread of information. Transforming knowledge into human use – technology is upheld. Philosophy and social sciences have contributed too but have not been adequately focused.

Creation of knowledge is not the end in itself. Technology helps us to widen our production frontier. That the pride of human civilization live and let live required for sustainability is a multidisciplinary sphere. Both wealth creation and judicious distribution are equally important. While the contribution of scientific knowledge (Physical Science and Mathematics) is relatively more in wealth generation, contribution of social science is greater in the latter field. It is therefore worthy to comprehend the concept of knowledge with particular reference to economic growth and development.

Defining knowledge economy is a difficult proposition like knowledge. However, understanding knowledge based economy is necessary. Primacy obviously lies with the latter one. Conceptualizing knowledge is difficult for its complexity but application or utilization of knowledge is within our perception – like air or quality. We have realized the novelty of knowledge in the forward march of civilization. In our personal life and in society, application of knowledge normally occurs without
being conscious about it. Utilisation of acquired (simple knowledge) focuses the ability of human mind or society as the case may be, to comprehend and to harvest benefits. Translation of knowledge into action in our life is complex, nevertheless we are continuously practicing.

Interpersonal and transnational differences persist. Explanation is various – two most significant factors are efficiency and stock of knowledge. Knowledge is to be produced – the end product of our enquiries which may be directed or in other words gained by conscious disciplined efforts. Human civilization has also been benefited by knowledge gained as by-product of some seemingly unrelated experiment or investigation. Invention of electricity is one of the classic examples.

Knowledge has also contributed by fashioning different stages of human bondage required for optimum wealth creation. Means of production is important but no less significant is mode of production at the aggregate level and organization and management at the grass root level. Good governance is prescribed at all micro and macro level for optimal harvesting. We are convinced about the power or necessity of good governance to influence the environment for productivity and to bring about more harmony in the society. However, relatively greater primacy is attached with productivity augmenting knowledge, that is, technology. In conceptualizing knowledge based economy, researchers have concentrated more on technology - application of knowledge for improving or influencing production frontier. Nevertheless, knowledge also contributes in changing economic order or socio-economic and political economy for example ameliorating various types of asymmetry in the world - inter and intra-regional inequality in the level of development.

Economic order of the society has been undergoing continuous (mutative) changes. Primitive – prehistoric society- has been modeled in the literature as traditional. Traditional Economic society was simple – technology was unheard. Collection, gathering and hunting were the means of production and survival. Utilizations of knowledge and experience were sublime. Agriculture society from scattered nomadic societies was born from Knowledge of how to use seed to sow and harvest. Development of agriculture society was influenced by discovery of variation of land fertility and crop suitability of land and understanding of seasonality.
Utilizations of knowledge or invention in the material world are continuously been supplemented by social science in the growth and development of human societies. Civilization marched forward by inventing the power of exchanging necessities and information in the society. Bartering was the centrifugal element. Primitive Traditional economy or barter economy has not completely been abolished. We experience mutative changes in many spheres; nevertheless we continue to brand it as traditional system.

Feudalism was born and successfully pushed forward production and productivity. Barter or exchange system became mostly inoperative – money and market mechanism replaced exchange of goods and services in kind. We rarely understand that market system is our powerful social invention. Regime of traditional economy is however continued to operate in which agriculture was the strength. Economists ignored the governance part which also underwent changes for efficient operation of market mechanism and early stage of economic expansion is univocally termed as agricultural economy. Feudalism prevailed for considerable part of agriculture economy in which land was the primary resource. Growth of market economy was facilitated by revolutionary changes in socio-political outlook on the one hand and scientific knowledge on the other.

Technology is relatively more emphasized in the literature. We therefore mostly observe economic expansion with reference to traditional agriculture economy and industrial economy. Takeoff of Rostow is the classic example. The systems have always been complex- superimposed mapping of socio-political and scientific knowledge is ignored. Knowledge development in every sphere is contributory to socio-economic development and shaping the presently emerging Knowledge Based Economy. Scientific invention translated into technology has been at the centre and still dominating the underpinning of Knowledge Based Economy or Knowledge Economy.

We resolve that applications of knowledge are relatively more important than creation of knowledge in the forward march of human civilization – economic progress in particular. Economic development presupposes economic growth.
Indeed, knowledge is used since the time immemorial as a product or a tool for the creation of wealth leading to economic well-being. Knowledge is to be produced or procured like other factors of production or commodities. Continuous endeavor is required for extending the frontier of knowledge which in the literature is branded as research and development - R&D. It is naïve to state that education and training facilities are the centrifugal element in knowledge creation and transforming knowledge into human use – translation of scientific invention and discovery into technology. Industrial revolution bears the testimony which made manufacturing activity as the significant source of wealth generation and the world economy transformed from agriculture based to industry based. Indeed industrial revolution is the main contributor of asymmetry in the development process in the world economy. Without prejudice it may be said that colonial system of exploitation is a negative externalities of Industrial revolution in the western hemisphere. Legacy still continues.

That our country was overpowered by British – we are to experience colonial exploitation may at least partially be attributed to inefficient utilization of our knowledge. Indian continent is a land of culture and education. India has had a strong background of formal education dating back to fifth century BC. It stands among the world’s most favourite education accesses especially since the time of Taxila and Nalanda. It also had the Gurukul system of education. It was the earliest form of residential education prevailed in India since the Vedic Period. There has been a continued effort for expanding India’s education system-formal and informal starting from the Vedic Period to Ancient India and from the Medieval Period to the Colonial Era down to the period of national administration.

After gaining political power in 1947, a concerted effort has been made to expand the formal education network through setting up of schools, colleges and the universities. The establishment of the UGC in 1956 and technical institutes like the IITs, NITS, National Institutes of Sciences, professional institutes such as medical colleges, judicial colleges and universities, IIMS, engineering colleges and universities, national laboratories etc. throughout the country have created a benign atmosphere of sound knowledge base of the Indian economy and society.

The 86th amendment of our Constitution in 2002 has made education a fundamental right. Along with this, the passing of the Right of Children to Free and
Compulsory Education Act, 2010 has given a great fillip to our education system. According to this Act, it is obligatory from the part of the State Governments and local bodies to ensure education for all the children in the age group 6-14. Access to education is thus recognized as the most important element to the growth and sustenance of a knowledge economy. India has a strong, vibrant and mature education base available under formal and lifelong learning systems. We have derived dividends and gradually transformed our economy into Knowledge Based Economy.

Indian administrative effort has been rewarding. India has made a soft beginning of Knowledge Based Society and Economy. It is the connectivity that is vital circulatory system of a knowledge economy. Apart from ICT based connectivity, all other conventional methods of connecting people are addressed and organized effectively for the growth and expansion of a strong and sound knowledge economy.

Growth of service sector and that of a solid industrial base along with wider application of science and technology in agriculture and agri-business are providing a very strong enabling environment for the emergence of India as a Knowledge Economy. Beneficial changes are observed in various spheres in Indian economy – indeed we should not have any hesitation to state that we have Knowledge Based Economy. However we have to address lot more areas to facilitate acceleration of our Knowledge Based economy for maturity and to improve our global standing.

Performance of Indian economy is fluctuating, however praise worthy compared to third world economies. India since independence and especially since 1980s achieved moderate to high increase in income and standard of living of its population. Political maturity of India may be identified with social science research and adoption of planning process on the one hand and attention to scientific research in various spheres. It will be no exaggeration to state that Indian polity started preparing herself to encourage Knowledge Based Economy as early as the third quarter of the last century. However the process was very slow.

India took up new economic policy during 1990s and as a result of which a lot of changes have taken place in the spheres such as opening up sectors to private investment, encouraging foreign direct investment, reducing red tape, further
liberalizing trade policy and exchange rate regime and reforming capital markets leading to an improved investment climate. Central controls are receded for provinces to have more freedom to maneuver. Regional experience is asymmetric; 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. Globalization and the knowledge economy have lead to poverty, unemployment, inequality and marginalization in some countries. The biggest challenge before most of the developing countries (including India) is to channelize the forces of globalization and the knowledge economy for the alleviation of poverty and the empowerment of people to 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 1980’s. 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. Growing at about 3.5 percent from the 1950s to 1970s, India achieved a growth rate of about 5.5 percent during 1980s. It achieved an annual growth rate of 6.7 percent during 1992-93 and 1996-97. This was possible only because of adopting new economic policy in
1991 through which the economy was mere open 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. Good weather during 2003-2004 pushed up agricultural output and consequently the growth of the economy was 8.2 percent. This fact however focuses our inability to overcome the adversity of climatic factors.

India undertook a series of reforms during 1990s 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 centre have receded control for states to have 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. 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 and in so doing , to 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 ingredients for making this transition. It has a critical mass of skilled, English–speaking knowledge workers, especially in sciences. It has a well-functioning democracy and its domestic market is one of the largest in the world. 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
Chapter-X: Conclusions, Findings and Recommendations

In addition the development of ICT sector in recent years has been remarkable.

Discussing India’s educational and human resource advancements with the help of World Bank data, 2005 we see that there has been marginal improvement during 2000-2005. India leads South Asia and Africa regions, but lags behind Poland, Russia and Korea. It is successful in the progress of literacy but its average years of schoolings 5.06 years [(larger than Brazil (4.88) but less than 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. India’s position in human resource development compared with China, Russia and Poland is not satisfactory.

One that disturbs India is its huge migration of skilled human resources to abroad. Policy makers and economists require information on global trends in agriculture and competitive prices of commodities, legislation that will improve agricultural production and marketing. With such a wide spectrum of the various information needs of agricultural stakeholders, it is very clear that information professionals need to develop a strategy of information provision so as to satisfy the information needs of those information users in agriculture. With this in mind, we have analyzed agricultural marketing information system in Indian context.

A marketing information system (MIS) consists of people, equipment and procedures to gather, sort, analyze, evaluate and distribute needed, timely and accurate information to marketing decision makers (Kotler and Aamstrong, 2002). MIS distributes information to the concerned stakeholders in the right form at right time to help them make better decisions. We have seen that various media, radio, television, literature and newspapers are mostly utilized by the extension workers to transfer agricultural technology to the huge illiterate and literate segments of the rural people. There is a great transformation in agricultural extension approach in dissemination of knowledge. The advancement made in information technology is so fast that every areas of livelihood have to be well organized to tie up such technology. It has been seen that generally the benefits of information technology have restricted
primarily to the urban areas. This is only due to lack of understanding about the new Information Technology in rural areas. Now after the revolution of IT a new approach has come up which actually strengthening the communication and training centres like Agricultural Science Centres and Farmers Training Centres which have reinforced the overall agricultural scenario.

In Indian rural markets, private traders largely dominate the marketing activity. Farmers, especially the marginal and small farmers are generally inadequately aware of market information like supply, demand, prices prevailing in the market, market charges etc. These are indeed crucial for proper decision making. There is no system of disseminating market information for the benefit of the producers and consumers. As such, the farmers who are in the villages have no chance to know the prevailing prices in the neighbouring markets at subdivision and district levels. They are never sure what price they will get until they reach the market. Prices fluctuate particularly in the peak season, when many farmers try to sell their production, under such circumstances the rural producers largely accept the price quoted by the traders.

Due to various economic reasons like indebtedness, need for cash, insufficient storage, lack of adequate transportation and other infrastructure facilities farmers are also at a disadvantage in striking the bargain. As a result, they are engaged in distress sales. Farmers may enjoy better price realization, if they are provided with the full market information regarding the price and demand of the crops they grow on time. This will ultimately motivate farmers to move towards better decision regarding production and sale decisions. This will prevent the tendency of farmers to jump into a decision on the basis of ruling price levels and later on discover that the prices have crashed when they are ready to sell their produce at the end of the season.

Credible and timely information plays a crucial role in agricultural marketing, particularly for perishables. Due to lack of proper market information channel and interference of middle man, the farmers have been exploited often and forced to sell their produce at lower price in their nearby market. The harvested produce can be sold at a premium price; information of the nearest alternative markets is disseminated to farmers on demand and daily basis. They can make better decision to harvest the
produce at right time and send their consignment to particular market where the market price is higher for his/her produce.

Knowledge or research and development efforts play a key determinant role in shaping trade pattern in manufactured goods (Raymond Vernon, “International Investment and International Trade in the Product Life Cycle”, Quarterly Journal of Economics 80, 1966, pp. 190-207). It begins with the analysis of new trade theories explaining the impact of R&D (knowledge) on international trade, ICT application in trade facilities, and e-commerce and trade facilitation at global level.

IT and Internet transaction help to minimize the adverse intervention of intermediaries in the business activities and consequently results in cost reduction. E-Commerce becomes more effective in enhancing international trade and commerce. Administrative efforts are required to develop infrastructure for faster and bigger capacity of communication such as phone, cable, and radio and satellite network. Strong general as well as technical education base of a country widen the scope of E-Commerce. The assurance of education is thus a priority for the growth of learning and research process. Administrative steps in this sphere are required for furthering the progress in India.

Contribution of knowledge in Industrial economy of our country is praise worthy. External influence in the industrial economy of India though can not be overlooked. It is naïve to state that western industrial revolution influenced industrialization in India. Political sub-judication by industrially developed western world is equally significant. India experienced a discrete jerk from the western countries – Great Britain in particular, the economy most fortunate to harvest early gains from industrial revolution. Results of western influence is mixed – industrial economy of India was shattered and at the same time we owe much to west for large scale industrial operation and widening of industrial sector. Resource base of the country started improving but west harvested maximum benefit. In what follows, Indian entrepreneur class could successfully utilize the available technology in the international market. In consequence we have moderately developed industrial sector at the time of transfer of power. Scientific research and planning process in India immensely helped industrial development during the post independent period and ultimately industrial sector of the country started becoming more knowledge
intensive. Corner stone of knowledge based economy – in particular knowledge based industrial sector – is quality human capital.

Human resource development has evolved as a critical element of broader business and human resource management strategies. The importance of an appropriately skilled and developed workforce is recognized by many in business as essential to the implementation of continuous improvement programs. An educated and empowered population resulting from proper human development strategies contributed significantly to increased productivity.

Human Resource Development (HRD) is the precondition for attaining progress in developing a knowledge-based society, reducing skills mismatches in the labour market, and promoting a country's international competitiveness thereby supporting social and economic development and well-being of the people.

Indian experience suggests that the focus of human resource development policies has been on promoting knowledge and skills through education and training and enhancing the employability. Indian administration emphasized improving access and equality of opportunity to all to live and work in knowledge and information based society as suggested by ILO, 2001. We have seen that HRD or education and skills of the labour force, is singled out as a fundamentally and centrally important dimension for a country’s development into a Knowledge Based Economy.

Although India has a high pool of science and technology graduates capable of competing with any country (e.g., USA, China, Brazil and the like) Indian software companies have so far failed to master the own brand product model in any substantial measure. What specifically India lacks is its inability to develop complementary capabilities in marketing. This is essential otherwise India will face serve competition from American and European firms in future. Increasing interdependence of flows of trade, investment, technology and capital is now the order of the day. Thus particular attention is needed to integrate trade with investment and technology strategies for great coordination. It is also necessary to achieve a higher level of integration among the domestic and international policies. India moves from creating, acquiring and adapting knowledge to become a generator and user of new
knowledge and technologies. India needs to create some special issues that are essential in terms of broad business environment.

**10.2: Significant Findings and Observation**

Following are some of the significant observations and findings of our investigation:

i. India has been successful in transforming its economy into a knowledge economy.

ii. India possesses a large pool of highly educated and vocationally qualified people (Chapter-IV). We have found that industrially advanced economies have been able to take the fullest advantage of the forces of globalization 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 (although this might not always be true). 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 to lead a decent standard of living. This calls for educational attainment of every citizen and human resource development through quality training and education.

iii. Marketing information plays a vital role in the functioning of the whole market, by regulating the competitive marketing process. It ensures that each marketing transaction is a fair one, and that all participants share the risks and benefits. However, this does not happen in India and in many developing countries. This is because of the fact that marginal and small farm communities do not have marketing information as has been in the case of big and medium farmers. Thus, it is observed that distribution of marker information to farmers is asymmetric.

iv. It has been observed that in the rural markets, the marketing activity is largely dominated by the private traders. Farmers are generally not aware of market information like supply, demand, prices prevailing in the market, market charges etc., which are crucial for proper decision
making (Chapter-VII). Indian economy is striving to improve the environment for advancing her knowledge based rural economy.

v. India is addressing the issues to accelerate the process of knowledge based industrialization. The nation has fostered an Industrial and S&T policy since the introduction of its planning process. Indian policies have been rewarding. This is particularly noticed in eradicating poverty and building infrastructure (human and social). This can be substantiated from the fact that India has attained some maturity in the area of science and technology. Still India’s overall performance is below optimal.

vi. There are cases of application of information and communication technologies in extension that have made a difference in the delivery of extension services in rural India. Some of these include the Warana Wired village Project in Maharashtra; Milk collection in dairy cooperatives (National dairy Development Board); Information Villages Project (MS Swaminathan Research Foundation-International Development Research Centre); Information Technology application for Indian Rural Postal System (CMC Limited, Hyderabad); Knowledge Network for grassroots innovations (IIM, Ahmedabad); Application of Satellite Communication for Training Field Workers and Extension Workers in Rural Areas (ISRO); Computerisation of Mandal Revenue Offices (MROs) and computer aided administration of revenue department in Andhra Pradesh. But these services should be evenly distributed across the Indian villages.

vii. On the basis of overall analysis we may infer that India has made a stride in all the spheres of the economy—in agriculture, in industry and in services, which, in fact, have improved the quality of life and ultimately the well-being of its population.
Chapter-X: Conclusions, Findings and Recommendations

10.3: Recommendations

On the basis of our analysis we may make the following recommendations:

i. Skills, knowledge and connectivity are some of the important forces for development of any economy. These are not equally distributed to all parts of the globe. Even within a country there remains variation in their distribution. This is more so in the developing countries like ours. In India for example, rural people are weakly connected with knowledge. To improve their conditions, it is of utmost importance to spread education, infrastructure facilities to all the people living in rural areas too.

ii. In software, India is an export-oriented powerhouse. But India lacks in domestic market if compared with other competitors like China and Brazil. Steps to be initiated for creating a vibrant domestic market. Administration should play more active role. We plead to strengthen intellectual property rights and their enforcement. Second, India needs to improve access to venture capital. Third, private sector should be encouraged for increased investment, productivity and employment opportunity. The ultimate object is thus to expand opportunities for the poor. Fourth, measures are required to attract more foreign direct investment in order to contribute strongly to the economy and society. Fifth, very often it is cited that India’s infrastructure is very poor. This in fact is a major obstacle to economic growth. It requires improving transportation, access to reliable power. Power sector reform is urgently required to improve business performance in India.

iii. Satisfactory production and economic results in agriculture can best be achieved through forming production cooperatives which should address formation of a complete production chain beginning with primary production, over getting a number of half-products, to finalization. Ultimately, these cooperatives would work as a multipurpose cooperatives starting from primary producers to the suppliers of inputs for agricultural production, buying agricultural crops, providing finance at a reasonable rate of interest.
iv. India produces more than two lakh scientists, engineers and technocrats every year. In spite of this, it has not been able to harvest full economic benefit because of mismatch between education and labour market.

v. It is also essential to initiate measures to control brain drain from India.

vi. It is necessary to improve the quality and skills of India’s current and future pool of technical manpower both from private and public institution for scientific R & D.

vii. We plead for increasing university-industry partnership to ensure consistency between research and the actual needs of the country.

viii. We also need to establish partnership between Indian and the foreign universities in order to attract and retain highly qualified faculty. This also provides opportunity to Indian students to acquire internationally recognized credentials.

ix. Asia spends alone more than 30 percent of world R & D expenditures. China for example has shown remarkable achievement in respect of R & D expenditure linking between the R & D and the market (World Bank, 2005). India may learn lesson from Brazil which has shown larger development effectively utilizing public funding and a large networks of partners to conduct R & D activity.

x. Our overall analysis shows that India has gained praiseworthy achievements in the IT domain. Data on the use of Internet, Telephone and Computers show that India has progressed lot in information and communication technology (ICT), but its overall information infrastructure needs to be further strengthened in order to become truly a knowledge economy.