

PROMOTING BUSINESS AND TECHNOLOGY INCUBATION FOR IMPROVED COMPETITIVENESS OF SMALL AND MEDIUM-SIZED INDUSTRIES THROUGH APPLICATION OF MODERN AND EFFECTIVE TECHNOLOGIES IN INDIA*

A. Backdrop

The oracle of human development provides infallible clues that the knowledge society has begun to take shape. This change has to reorient our long-learned habits of work, learning, communication and culture. Human efforts to exist and to improve upon, have constantly and qualitatively changed from one phase to another. From food gatherers and hunters, humankind developed itself into a harmonious and artistic topped agricultural economy. The accumulation of wealth in the agricultural economy gave way to a more dynamic and vibrant industrial economy. The industrial economy further improved the support systems of the human society, including health, education and social security systems. The knowledge generated in the matured industrial economy gave birth to the possibility of a paradigm shift towards a knowledge society. The success factors for a nation in an agricultural economy have been land, labour and natural resources. Nations of the feudal world who were bestowed with these factors generated wealth and improved their quality of national life. In an industrial economy the winning edge of the nations and therefore quality of life of their populace came from capital, management and machinery. Obviously industrial economy saw those nations with these dynamic ingredients prospering. In a knowledge society the factors of success come from its strength in science and technology, entrepreneurship and innovation. Those nations developing and sustaining these capabilities shall emerge most prosperous. The factors ensuring success in the different phases of the evolution process though not completely new have to be reoriented and reprioritized to ensure the necessary momentum.

The global trend across developed and developing countries has shown that knowledge-based industries generate wealth and employment opportunities and bring prosperity to the nation. So, conscious and concerted efforts to develop suitable mechanisms for promoting knowledge-based industries have become the focus of science and technology and industrial promotion. It is estimated that around 3,000 incubators of various types exist around the world. Among them, the United States and Germany along with other European countries contribute more than 80 per cent of the incubator population. Among developing countries and areas, China, Taiwan Province of China, Republic of Korea and Malaysia have shown good progress in promotion of incubators for promoting knowledge-based industries.

Science parks, a new class of industrial promotion organization, developed alongside the higher institutions of learning, have been experimented throughout the world, only during the last 50 years as first generation. The science park as an organization is dedicated to encourage the formation and growth of knowledge-based industrial ventures and to be actively involved in transfer of technology and business skills to industries. In India, way back in 1980s, the Nayudammah Committee, taking cognizance of this new phenomenon worldwide, clinically analysed the Indian situation and reiterated the need for a new Indian model of science park. After careful deliberations, considering the prevalent industrial and cultural situation in our society, sharper focus was brought to this and the STEP concept was born. While the broad framework of the worldwide science park is maintained, the focus had been more sharpened towards entrepreneurship development for our society which lacks the intensity of an entrepreneurial culture, that is prevalent in some of the successful western and eastern counterparts. In addition to this, the objective of ushering in a technocrat society is added to unfold the mission canvas peripheries to include a much broader mission to the Indian STEPs.

NSTEDB, under Ministry of Science and Technology, Government of India has responded to this situation by promoting STEPs as a first phase for promoting knowledge-based industries and is now, developing TBIs as a smaller but more focused initiative to promote hi-tech start-up companies. The main source of creative ideas

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for new activities should emanate from the environs of the knowledge source that is educational/research institutions, using the facilities and expertise of educational/research institutions.

This should be taken to the marketplace by the entrepreneurs for the benefit of the society. So, in order to maintain our competitive advantage globally, science and technology parks and incubators are indispensable and have been the call of our time. Department of Science and Technology, Government of India taking an early lead has promoted 15 STEPs in India within leading educational institutions such as Indian Institutes of Technology and Regional Engineering College together with the state governments and financial institutions. Now, Department of Science and Technology is in the process of promoting 5 to 7 TBIs in different parts of the country. While STEPs shall remain as the multidimensional developmental projects, taking up many development projects such as skill development, industrial promotion and other activities along with business incubation, technology business incubators on the other hand shall focus mainly on knowledge-based initiatives. For this shared sophisticated facilities are being established by Department of Science and Technology, in specific technology areas in the educational/research institutions in India.

India is the second most populous country in the world and the seventh largest. Liberalization policies have been opening up new threats and opportunities in India at a mind boggling pace. A series of ambitious economic reforms aimed at deregulating the country and stimulating foreign investment has moved India steadily into the front ranks of the rapidly growing Asian and Pacific region and unleashed the latent potential of a complex and rapidly changing nation. Its political institutions have fostered an open society with strong collective and individual rights and an environment supportive of free economic enterprise.

India's time tested institutions offer foreign investors a transparent environment that guarantees the security of their long-term investments.

Today, India is one of the most exciting emerging markets in the world. Skilled managerial and technical manpower that match the best available in the world and a vibrant middle class whose size exceeds the population of the United States or the European Union, provide India a distinct edge in global competition.

B. Policy framework related to S&T and SMEs

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C. STEPs and TBIs in operation in India

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D. Conclusions and recommendations

1. Policy care

1. We are at a historic crossroad in industrial development, where new ventures especially knowledge-based ventures and entrepreneurs have to be groomed right from conceptualization till realization of the ventures and this process cannot be viewed as a spontaneous phenomenon. Knowledge-based ventures have proved beyond doubt, worldwide that they can generate wealth and employment for the nation. The return on investment for cultivating and harvesting the benefits of knowledge-based ventures needs to be measured and investments for knowledge venture farms/STEPS/TBIs have to be made based on these returns for the society. As of now we have no system to measure the multifaceted benefits of TBIs/STEPS and cursory glance would reveal the results produced by them far out weigh the investments made. The benefits of the TBIs/STEPS have a real snowballing effect over a period of time, this has been hardly recognized and so, not properly utilized for the benefit of our societies.

2. TBI experience in STEPs in India have provided us with shining examples of knowledge-based ventures promoted by our entrepreneurs. Many new ventures were created through the STEPs in the past one-decade and these ventures are truly growing exponentially. Some of them shall upscale into large-scale

industries within this decade providing growth, employment and hope for our nation. As a pure investment opportunity alone STEPs have provided more returns to the government in terms of direct and indirect taxes and employment opportunities and therefore the investment made on incubators/STEPS as such are commercially more lucrative when seen from a long term societal point of view.

3. Academia provides another excess intellectual capacity available with the nation for grooming new knowledge-based ventures. The intellectual capacity of academicians should be deployed to produce new ventures and add more value for our society. New innovative intervention strategies need to be devised to ensure participation of academicians in the process of knowledge-based venture creation.

4. Entrepreneurship is an inspiring phenomenon and nations demonstrating the spirit of entrepreneurship and innovation have demonstrated that this spirit provides physical well-being of the society as whole. The practice of entrepreneurship therefore naturally paves the way to a culture of entrepreneurship. Since some of the entrepreneurs in knowledge-based ventures in STEPs/TBIs are shining role models they need to be catwalked to a larger audience to inspire them to at least appreciate and encourage the culture of entrepreneurship. At present, proper packaging and presentation of products of STEPs/TBIs has been paid very little attention. This has to become part of the objective of STEP/TBI development.

5. Awareness about TBIs among important related sectors such as academicians, policy members, developmental institutions need to be strengthened. This shall create an enabling ambience and gather support for the mission.

6. Ventures promoted by STEPs/TBIs have the inherent potential to promote more new ventures by virtue of their experience and acquired skill levels in the process. This needs to be understood and the concept of 'serial entrepreneurship' should be recognized and supported.

2. Institutional mechanisms

1. The potential of the academia is largely undermined and unexploited at least in practice, in the process of TBI in developing countries. Entrepreneurs and academicians working together are a winning combination. However, such combinations are of very rare occurrence in STEP/TBIs. In the absence of a suitable mechanism to facilitate the participation of academicians in TBI process, it is more likely to remain a rare occurrence in the future also. So, new institutional mechanisms are needed in this direction.

2. There is a need for more intensive participation of the host institutions. It is imperative that the host institutions should also redefine some of its internal structures and reward recognition system in order to appreciate and promote participation of academicians in TBI process. This requires coordination at the apex levels, unveiling new mechanisms and recognition systems for facilitating academia participation in TBIs.

3. TBIs/STEPS needs to be self-supporting organizations after initial start-up support, in order to demonstrate high-level entrepreneurial credibility. This alone can ensure confidence and credibility in the eyes of the budding entrepreneurs. The culture of a self-supporting organization can also appreciate the efforts of growing entrepreneurs more readily. Entrepreneurs and incubators develop closer ties to each other if they become co-travelers towards the same objectives of business.

4. The relationship between STEP/TBIs with the knowledge-based ventures need to be revisited at this point. If knowledge-based ventures are getting leveraged because of Incubators, then Incubators also need to be benefited by the relation. Equity participation is one such mechanism which shall ensure a symbiotic relationship between incubators and the promoted knowledge-based ventures.

5. STEP/TBIs need to evolve into entrepreneurial organizations among developmental organizations. This is possible only by developing innovative facilitating system in place of management control systems. For this management knowledge is as important as new technology.

6. STEP/TBIs need to develop "angeling" mechanisms for promoting future entrepreneurs by the already bloomed knowledge-based ventures. This again shall be a mechanism for leveraging entrepreneurial growth.