

## Role of Science and Technology Entrepreneurs' Parks (STEPs) towards Entrepreneurship Development in India

T. Manjunatha\*, Dr. N. Nagesha\*\*

\* Department of Mechanical Engineering, Sri Jayachamarajendra College of Engineering,  
Mysore – 570006, Karnataka, India.

\*\* Department of Industrial and Production Engineering, University B.D.T. College of Engineering,  
Davangere – 577004, Karnataka, India.

### ABSTRACT

India is the seventh largest and second most populous country in the world. A new spirit of economic freedom is now stirring in the country, bringing sweeping changes in its wake. A series of ambitious economic reforms aimed at deregulating the country and stimulating foreign investment has moved India firmly into the front ranks of the rapidly growing country in the Asian and Pacific region and has unleashed the latent strengths of a complex and rapidly changing nation. India's dynamic and highly competitive private sector has long been the backbone of its economic activity. It accounts for over 75 per cent of its gross domestic product and offers considerable scope for joint ventures and collaborations. Technology and knowledge are becoming the buzzwords of the new millennium. As the technology is leapfrogging beyond the speed of light, enormous activities are underway in research and development areas paving ways for new and newer technologies day by day and also resulting into the emergence of new areas of technology. These rapid paces of developments in the field of science and technology are also leading towards a new class of knowledge savvy entrepreneurs and knowledge/technology driven enterprises, which are being recognized as an important factor for the economic development of nations and a source of value-added employment generation.

*Keywords: Science and Technology Entrepreneurs' Parks (STEPs), Entrepreneurship, Entrepreneurship Development, Department of Science and Technology.*

### 1. Introduction

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 middle class whose size exceeds the population of the United States or

the European Union, provide India with a distinct cutting-edge in global competition.

Some of the key economic indicators are shown in the Table1.

Table 1: Indian Economic Indicator [1].

India - Macro-economic Summary : 1999-2000 to 2011-12 (as on 1st April, 2012)													
Indicators	1999-2K	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12 (AE)
India's Real GDP Growth Rates (Factor Cost)	6.04	4.35	5.81	3.84	8.52	7.60	9.49	9.60	9.30	6.70	8.40	8.39	6.88
Agriculture growth (%)	0.5	-4.2	6.3	-7.2	10.0	1.6	5.1	4.2	5.8	0.1	1.0	7.0	2.5
Industry growth (%)	4.6	6.4	2.7	7.1	7.4	9.4	9.7	12.2	9.7	4.4	8.4	7.2	3.9
Services growth (%)	9.5	5.7	7.2	7.5	8.5	9.4	10.9	10.1	10.3	10.0	10.5	9.3	9.4
By Demand (%YoY)													
Consumption	7.2	3.0	5.3	2.3	5.4	2.3	8.6	7.9	9.3	7.6	8.1	8.1	6.0
Private Consumption	6.1	3.4	6.0	2.9	5.9	2.1	8.5	8.7	9.2	7.1	7.0	8.1	6.5
Public Consumption	13.2	0.9	2.3	-0.4	2.6	3.4	8.9	3.8	9.6	10.4	14.3	7.8	3.9
Gross Fixed Capital Formation	11.2	0.0	7.4	6.8	13.6	20.7	16.2	13.8	16.2	3.5	6.8	7.5	5.6
Consumption: Investments, Savings (%GDP)													
Consumption	79.4	78.5	78.9	77.2	75.9	70.3	69.3	69.3	67.4	68.8	69.4	68.4	67.9
Capital Formation	25.3	23.8	22.3	24.6	26.9	32.8	34.7	35.7	38.1	34.3	36.1	35.8	35.4
Gross Domestic Savings	24.2	23.2	22.9	25.7	29.1	32.4	33.4	34.6	36.8	32.9	33.8	32.3	33.0
Money Supply	14.6	16.8	14.1	14.7	16.8	12.0	21.4	21.3	21.1	19.3	16.7	16.0	17.0
Bank Credit growth	18.2	17.3	15.3	23.7	15.3	30.0	37.0	28.1	22.3	17.5	16.7	21.4	18.0
Deposit growth	13.9	18.4	14.6	16.1	17.5	13.0	24.0	23.8	22.4	18.0	17.0	15.8	17.0
Fiscal Indicators (% GDP)													
Centre's Fiscal Deficit	-5.2	-5.4	-6.0	-5.7	-4.3	-3.9	-4.0	-3.3	-2.5	-6.0	-6.5	-5.2	-5.8
State Fiscal Deficit	-4.5	-4.0	-4.1	-3.9	-4.2	-3.3	-2.4	-1.8	-1.5	-2.4	-3.3	-2.5	-2.5
Combined Deficit (Centre+State)	-9.0	-9.1	-9.5	-9.1	-8.1	-7.2	-6.5	-5.4	-4.1	-8.4	-9.6	-8.1	-8.3
Inflation - WPI (Average)	3.3	7.1	3.6	3.4	5.5	6.5	4.4	6.5	4.8	8.0	3.6	8.6	9.0
CPI (Average)	3.4	3.7	4.3	4.1	3.8	3.9	4.2	6.8	6.2	9.1	13.0	9.5	9.0
Exports (US\$bn)	37.5	45.5	44.7	53.8	66.3	85.2	105.2	128.9	166.2	189.0	182.4	250.5	288.0
% YoY	9.49	21.33	-1.76	20.36	23.23	28.51	23.47	22.53	28.94	13.72	-3.49	37.34	14.97
Imports (US\$bn)	55.4	57.9	56.3	64.5	80.0	118.9	157.1	190.7	257.6	308.5	300.6	381.1	457.3
%YoY	16.50	4.91	-2.76	14.56	24.03	48.63	32.13	21.39	35.08	19.76	-2.56	26.78	19.99
Trade deficit (US\$bn)	-17.8	-12.5	-11.6	-10.7	-13.7	-33.7	-51.9	-61.8	-91.5	-119.5	-118.2	-130.6	-169.2
Invisibles (US\$bn)	13.7	9.8	15.0	17.0	27.8	31.2	42.0	52.2	75.7	91.6	80.0	84.6	105.0
Current Account Deficit (US\$bn)	-4.1	-2.7	3.4	6.3	14.1	-2.5	-9.9	-8.6	-15.7	-27.9	-38.2	-45.9	-64.2
% to GDP	-0.9	-0.6	0.7	1.2	2.3	-0.3	-1.2	-1.0	-1.3	-2.3	-2.8	-2.7	-3.5
Capital Account (US\$bn)	9.5	8.8	8.6	10.8	16.7	28.0	25.5	45.2	106.6	6.8	91.6	62.0	62.1
% GDP	2.0	1.9	1.7	2.1	2.7	3.9	3.1	4.8	8.6	0.6	3.8	3.7	3.4
Foreign Assets (excl. gold) (US\$bn)	35.1	39.6	51.0	71.9	106.1	135.1	145.1	191.9	299.1	241.6	252.8	273.7	271.6
External Debt (US\$bn)	86.3	101.3	98.8	104.9	112.7	134.0	139.1	172.4	224.4	224.5	261.0	306.4	326.6
Short Term Debt	3.9	3.6	2.7	4.7	4.4	17.7	19.5	28.1	45.7	43.3	52.3	65.0	71.5

### 2. Entrepreneurship Development Initiatives in India

India has been encouraging entrepreneurship development through the Five-Year Plan since independence. A number of institutional mechanisms have been set up in the past to encourage entrepreneurship among the people. The Small Industries Development Organization (SIDO), through the network of Small Industries Service Institutes (SISIs) has been a pioneer in conducting Entrepreneurship

Development Programmes for various sectoral groups. National Institutions such as the Entrepreneurship Development Institute of India (EDII), Ahmedabad; National Institute for Entrepreneurship and Small Business Development (NIESBUD), New Delhi; and the National Institute of Small Industry Extension and Training (NISIET), Hyderabad are engaged in entrepreneurial activities since their inception. In addition, state level institutions such as the Centres for Entrepreneurship Development (CED) and Institutes of Entrepreneurship Development (IED) look after the entrepreneurial efforts in the States. The District Industries Centres (DICs) set up at the district levels are also engaged in entrepreneurial activities.

### 2.1 National Science and Technology Entrepreneurship Development Board (NSTEDB)

The NSTEDB was established by the Government of India in 1982 “as an institutional mechanism to promote gainful self-employment in the country and to link idle S&T manpower with the underutilized institutional credit facilities”.

The major objectives of the NSTEDB are:

- To promote and develop entrepreneurship through the use of science and technology
- To facilitate and conduct various informational services relating to entrepreneurship development using S&T
- To network various central and state government agencies and NGO’s in entrepreneurship and self-employment developments using S&T with special focus on backward areas as well
- To act as a policy advisory body to the Government in regarding entrepreneurship based on S&T and conduct studies supporting policy evolution

The major activities that have evolved during the past and is being implemented by the Board is shown in figure below.

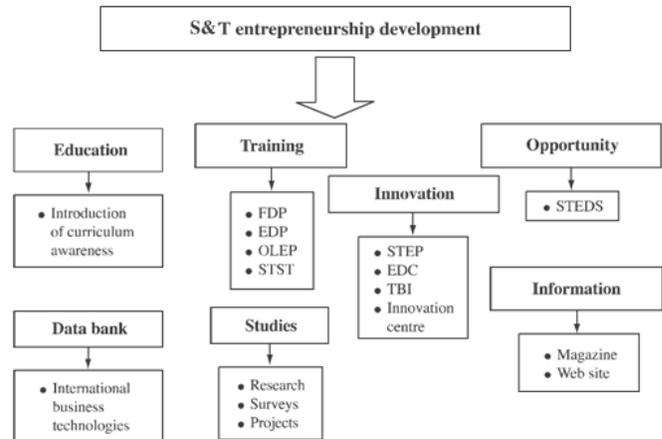


Fig.1: Schematic diagram of the Science and Technology activities in India

As result of the multifaceted activities spreading around the country, awareness among S&T persons to take to entrepreneurship as a career has been created. The academics and researchers have started taking a keen interest in such socially and economically relevant roles and have engaged themselves in several ventures. More than 100 organizations, most of which are academic institutions and voluntary agencies, were drafted to the task of entrepreneurship development and employment generation [2].

NSTEDB is the nodal agency in India for promoting STEP, TBIs and other mechanisms of high-tech enterprise development.

### 2.2 Science and Technology Entrepreneurs Parks (STEPs)

The science park and similar initiatives in the developed countries are the latest in the evolutionary line to create an atmosphere for innovation and entrepreneurship; for active interaction between academics and industries; for sharing ideas, knowledge, experience and facilities for the development of new technologies and their rapid transfer to the end user. The STEP programme was initiated by NSTEDB in 1984. STEP provides a reorientation in approach to innovation and entrepreneurship involving education, training, research, finance, management and government. It has been promoted jointly by the DST, state government, financial institutions and the host institution [3].

Objectives of STEPs:

- To forge a close linkage between universities, academic and R&D institutions on the one hand and industry on the other
- To promote entrepreneurship among science and technology persons, many of whom were otherwise seeking jobs soon after their graduation
- To provide R&D support to the small-scale industry mostly through interaction with research institutions
- To promote innovation based enterprises

Facilities and services provided by STEPs:

- ❖ Offers facilities such as nursery sheds, testing and calibration facilities, precision tool room/central workshop, prototype development, business facilitation, computing, data bank, library and documentation, communication, seminar hall/conference room, common facilities such as phone, telex, fax, photocopying;
- ❖ Offers services like testing and calibration, consultancy; training, research, prototype development/ process development, human resource development (short-term courses), technical support services, business facilitation services, database and documentation services, quality assurance services and common utility services.

### 2.3 STEPs - Processes and Actions

The STEP has a primary mission of ushering in a technocrat industrial society through human resource development (HRD) inputs enhancing the managerial and technical capabilities in particular and providing infrastructure and expertise support for enhancing productivity, quality, finance, R&D personnel, management capabilities, etc. during the establishment, sustenance, and growth of the incubating enterprise in general.

The STEP model, therefore, has been designed in striking a balance between development and self-sustenance. The areas of activities such as entrepreneurship training, product development, database, information, servicing, consultancy, quality assurance, business facilitation, continuing education and skill development training, etc. are grouped under three

categories as follows: promotional, cost and profit activities.

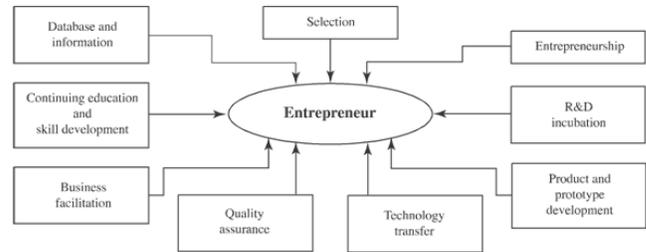


Fig 2: STEPs Processes and Actions

The Government of India has set up 15 STEPs in the past and out of which 14 are now undertaking business incubation activities in different sectors of science and technology, (one has been closed due to management problems) depending on the core strength and industrial milieu existing in the vicinity. Each STEP also follows its own particular model depending on the local needs and the environment.

The number of start-up units, technologies developed, employment generated, total turn-over by companies are shown in table below [4].

Table 2: STEP's locations showing number of start-up units, technologies developed, total turnover and employment generated

Step locations	Number of units	Technologies developed	Turnover (Rs in million)	Employment
Mysore	110	25	300.00	800
Trichy	153	26	300.00	1 700
Kharagpur	31	59	30.00	313
Ranchi	51	60	105.00	695
Pune	25	60	10.00	160
Roorkee	18	40	15.50	150
Ludhiana	95	53	110.00	680
Kanpur	16	10	30.00	200
Bhopal	63	08	15.00	1 458
Suratkal	106	04	103.30	298
Coimbatore	55	05	150.00	1 090
Hyderabad*	4	03	-	24
Bagalkot*	3	01	-	15
Patnala*	1	03	-	6
<b>TOTAL</b>	<b>731</b>	<b>357</b>	<b>1168.80</b>	<b>7 589</b>

Note: \* New locations.

### 3. Conclusions and Suggestions

Technology/Business Incubation is an institutional mechanism to develop an atmosphere for innovation and entrepreneurship; for active interaction between academics and industries; for sharing ideas, knowledge, experience and facilities and for the development of new technologies and its rapid transfer to industries through setting up of start-up companies in the emerging areas of

technology. As we enter into the 21<sup>st</sup> century, both industrialized as well as industrializing countries are arguably poised on the threshold of a major economic transition from manufacturing based economies to knowledge-based economies.

Effective planning and execution of STEP incubator alone would not make it a success. The presence of an outstanding R&D institution alone does not cause the development of high-tech start-ups. The incubator is envisaged as a service function and a facilitator that can encourage the development of high technology enterprises, but it cannot create the trend. The catalytic factors for technology incubation include, among others, (i) national policies and legal frameworks for TBIs and enterprises, (ii) financial support system including venture capital, (iii) a society open to innovation and entrepreneurship, and (iv) the support services provided by the incubators to the enterprises. If TBIs are to be of significant value in promoting new technology-based enterprises and generating jobs, the economic and cultural seedbeds need careful preparation to receive the entrepreneurial seed.

The key factors that can affect growth of technology-based enterprises are: (i) access to skills and competencies, (ii) access to financing, (iii) access to market, and (iv) conducive environment for innovation.

#### **References:**

- [1] Economic survey 2009-10, Ministry of Finance, Government of India. (<http://indiabudget.nic.in/>)
- [2] Menon P.K.B., Policies and support for promotion of business and technology incubation in India, ISBN: 92-1-120353-9, 2004. (ST/ESCAP/2323)
- [3] Ms. Anita Gupta, Indian experience on promoting business and technology incubation for improved competitiveness of Small and medium-sized industries through technological developments, ISBN: 92-1-120353-9, 2004. (ST/ESCAP/2323)
- [4] Shivaram M. N., Promoting business and technology incubation for improved competitiveness of small and medium-sized industries through application of modern and effective technologies in India, ISBN: 92-1-120353-9, 2004. (ST/ESCAP/2323)