



Business Incubators in Asian Developing Countries

Farhan Jamil^{1*}, Kamariah Ismail², Muhammad Siddique³, Muhammad Muddassar Khan⁴, Abdul Ghafoor Kazi⁵, Muhammd Imran Qureshi⁶

¹Faculty of Management, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia, ²UTM Technology Entrepreneurship Centre, Universiti Teknologi Malaysia, Skudai, Johor, 81310, Malaysia, ³Faculty of Management, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia, ⁴Faculty of Management, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia, ⁵Faculty of Science Technology and Human Development, Universiti Tun Hussein Onn, Malaysia, ⁶Faculty of Management, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia. *Email: farhanutm@hotmail.com

ABSTRACT

The purpose of this study is to review the literature of business incubators (BIs) particularly in developing countries context. The extensive literature in developing countries like China, India, Malaysia and Pakistan supports the concept of BIs as a part of their national innovation system and also for economic development. We further found from the literature that BIs contribute in achieving the commercialization targets, creating new startups, promoting the entrepreneurial culture, innovation and generating revenue. However, the concept is at initial stages of implementation particularly in Pakistan and Malaysia. The lack of human and technical expertise and financial constraints are the main reasons behind this slow progress. This study contributes to improve the understanding of business incubator's strategies, objectives, functionalities, implementation and outcome in developing countries. Additionally, this study provides the useful information to policy makers, government, academicians and practitioners about the BIs.

Keywords: Business Incubators, Technical Expertise, Financial Constraints

JEL Classifications: M10, J10

1. INTRODUCTION

Business incubators (BIs) are considered as a growth engine of the prosperity in both advanced and emerging society for the promotion of small-medium enterprises (SMEs) (Mahmood et al., 2016). Instead, the effective and well-integrated BIs also contribute in the development of entrepreneurial society (Jamil et al., 2015b). However, to achieve the status of entrepreneurial society, the coordination between government and private sector requires being well-integration (Jamil et al., 2015). Moreover, BIs are renowned for commercialization of research or product (Jamil et al., 2015a) and new startups (Al-Mubarak and Busler, 2011). In universities scenario, BIs are serving as an investment vehicle for the development of commercialization of universities technologies to increase job opportunities in community (National Business Incubation Association, 2014b).

Although the concept of BIs laid back to more than 50 years ago, it has gained much recognition in recent decade. The latest recorded number of incubators around the world is more than 7000 (National Business Incubation Association, 2014a). The first business incubator was founded in 1959 in Batavia, New York as a privately owned for-profit center (Brown et al., 2000). Until 1970s, the formation of new ventures falls in less priority list. In 1980s, only 12 incubators were in operation while the figure rise to 1250 by 2012 only in USA and then overall reaches beyond the mark of 7000 (National Business Incubation Association, 2014a). The numbers of incubators are increasing at a high rate. Thus, BIs have become a growing phenomenon around the world.

In addition, researchers identify the main functions of incubators are (1) Provision of conducive environment (2) access to advanced technical equipment's (3) managerial support (4) access to

financial capital (5) support the entrepreneur's in earlier age for their survival and growth (6) rationalize transaction cost (7) screening and selecting incubates (8) guidance in development of business plans. The purpose of this study is to better understand the phenomenon of BIs by reviewing it in context of developing countries i.e. China, India, Malaysia and Pakistan. This will help to understand the concept thoroughly and also to compare it in different developing countries.

2. BIS IN ASIAN DEVELOPING COUNTRIES

Although the concept of BIs originated in the US, BIs are now being functioning all over the world. They can potentially play a significant role in developing countries such as China, India, Malaysia and Pakistan. China and India are amongst the top beneficiaries of BIs especially in developing countries. Though, they are still struggling to compete in international markets particularly the US. Except few developing countries like China, India etc. others are struggling to cope up with innovation and entrepreneurial environment with lack of incubators particularly through university forum. Limited technical and business expertise, infrastructure, lack of resources are being the main obstacles to achieve the target (Al-Mubarak and Busler, 2010).

Asia, the largest and mostly developing region with around 50 countries, enjoys more than 2000 BIs. Out of 2000 incubators, most of the BIs are operating in the populous countries of Asia such as China and India.

2.1. China

From the late 1980s, it was realized by China that they need an environment that would be conducive for research and development (R and D), innovation and commercialization of research. Thus, to overcome these issues, BIs were seen as the solution. BIs are being expanding in China in a remarkable way especially during the last decade (Mahmood et al., 2015). China reportedly had the third largest business incubator program in the world. Whereas, the first BI in China was started in 1987 by an initiative of Ministry of Science and Technology (MoST) at Wuhan, Hubei Province.

According to the MoST statistics, by the end of 2012, there were 1,239 technology business incubators (TBIs) with over 22,000 service and management staff nationwide, of which 435 were at the national level (MoST, China).

This massive quantum of BIs has played a massive role in facilitating the China's transitions from a socialist country to a market economy. This is being done by promoting the innovation culture and commercialization of technological development (Lalkaka, 2003, 2006).

Table 1 and 2 indicates China with most incubators in the region though is being facing financial constraints to promote knowledge commercialization through start-ups whereas a compatible financial model is conceptualized as essence for industrial growth (Chandra et al., 2007). Although new programs are initiated and huge investment is made in last few years. The tech program of

MoST has contributed a lot in this transition (Chandra and Fealey, 2009). The purpose of Tech Program is to support the creation and growth of incubators in China. Accordingly, Chinese government has allocated the dedicated funds for incubators.

2.2. India

BIs have also contributed in the economic development of India. BIs have been framed as the agenda of government's science and technology policy. Technology advancement is the essence of India's economic development. Most of the BIs support software companies. The facilities and benefits available to sponsor are income tax exemption, duty free imports of equipment, royalties and reimbursement of know how fees (Lalkaka, 2006). However, well conducive environment with state of the art infrastructure are the main shortfalls in their business incubator model to commercialize R and D (Al-Mubarak and Busler, 2010). In response, several programs are introduced to handle these barriers including TBIs scheme. UNDP's Technology Management Program Support has supported this program, resultantly two TBIs are being established. By the end of 2009, the figure of TBIs in India was approximately 120 (Tang et al., 2013). Out of these 120, 40 TBIs were established in software technology parks (STPs). STPs are being promoted by the ministry of information and communications technology. While about 30 TBIs are being supported by other government departments, banks and financial institutions, and private companies.

BIs in India are mostly associated with universities and research institutes with the objective to assist entrepreneurs and commercialize the research. In India, incubation period is of 2 years and have a structure periodic performance assessment criteria for tenants. BIs provide diversified services includes infrastructure, conducive environment, business support and funding.

2.3. Malaysia

The third industrial master plan (2006-2020) of Malaysia emphasizes the promotion and support of small enterprise sector. This demands more effective programs and initiatives of BIs to strengthen their support for development of startup companies. The adoption and application of advance technologies, encourage research and development activities, linkages with universities and research institutes, enhancing human capital, nurturing innovative enterprises and continued support for technology and innovation through these BIs. However, lack of funding causes a big problem among technopreneurs (Jusoh, 2006).

In Malaysia, incubators are mainly set up by government-owned or government-related organizations. The SIRIM industrial incubator scheme plays an important role in the nation's system of innovation through transfer of technology and commercialisation efforts (Ghazali, 2010). According to him, the first-generation technology incubator scheme provides basic facilities and a conducive environment to aid the early growth of technology-based enterprises. Whereas, the second-generation incubation concept provides a complete process of incubation from technical concept moving to its commercialisation through

Table 1: Some statistics relevant to BIs

Year	Number of BIs (unit)	National TBIs	Space area (10,000 m ²)	Number of tenants (unit)	Total income of tenants (100 million yuan)	Accumulated number of graduated tenants (unit)	Number of employees of tenants (10,000 person)
2000	164	48	339.5	8653	207	2790	14.4
2003	431	98	1358.9	27,285	759.3	8981	48.3
2006	548	168	2008	41,434	1926	19896	79.3
2009	772	279	2901.3	50,511	2000.8	32301	101.2
2012	1239	435	4375.8	70,217	4958.3	45160	143.7

Ministry of Science and Technology P.R. China, TBIs: Technology business incubators

Table 2: Types and role of business incubators in China

University based incubators	University based incubators are a special type of business incubator that exist in China. Universities in China facilitate their students and industry through new innovations. University based incubators are similar to general business incubators but they have some unique characteristics; employment opportunities for own students, commercialization of university research, academia industry linkages
Innovation centre	Innovation centres are the latest invention of business incubators in China. Mostly, innovation centres are sponsored by local government to promote innovative culture
Technology business incubators	Technology business incubators are technology focused incubators. They seek to combine technology, resources and know-how to leverage entrepreneurial talent, speed up the development of nascent business, and thus expedite up the commercialization of technology
Over sea student enterprise park	These incubators have different kinds of objectives, the main objective of this incubator to reduce the brain drain and attract top Chinese students and experts in foreign countries to contribute their knowledge and capacity to motherland
Industrial business incubators	These are generalized industrial nurseries for nurturing new business start-ups with a view to promoting entrepreneurship and stimulating the emergence of industrial establishments at the small-medium enterprise level. There are no restrictions on tenant admission beyond the minimum basic requirements as may be stipulated in the admission procedure
International business incubator (IBI)	There are 9 IBIs in 9 cities of China. IBI has become a platform for international cooperation and communication. They promote the local SMEs to explore the over sea market. On the other hand, IBIs help the foreign SMEs to develop in China
China over sea science park	Chinese government has set up several over sea science parks in Manchester UK, Cambridge UK, Maryland USA, Moscow Russia, Vienna Austria, Singapore as well as Australia

Source: Mahmood et al., 2016. IBI: International business incubator, SMEs: Small-medium enterprise

Table 3: Business incubator/science park in Malaysia

Name/location of business incubator/science park	Size (acre)	Year set up	Number of firms	Technology focus
Technology park Malaysia Kuala Lumpur	750	1995	120	ICT, biotechnology
Technovation Park UTM Campus, Skudai, Johor	130	1995	21	High tech activities
Kulim Hi-Tech Park Kulim, Kedah	630	1996	33	High-tech manufacturing
UPM-MTDC technology incubator centre one	18	1997	32	IT and multimedia
UKM-MTDC Smart Technology Centre	6	1999	10	Biotechnology, pharmaceuticals
UTM-MTDC technology innovation centre one	NA	1999	NA	Advanced electronics, advanced manufacturing
MSC central incubator	NA	2000	35	IT and multimedia
Selangor science park	478.4	2001		

Source: Malairaja and Zawdie, 2008

entrepreneur development, enterprise creation and market development.

The relative success of the Malaysian incubation programme to date is due in large measure to the convergence of services offered and to continuing government support – an emerging triple-helix of university, state and business collaboration. The problems to be tackled are: Raising scientific research productivity and technological innovation, developing good incubator managers, promoting an entrepreneurial culture, and transiting from dependence on government subsidy to reasonable sustainability (Ghazali, 2010). Table 3 shown the Business incubator/science park in Malaysia.

2.4. Pakistan

Although BIs are also operationalize in Pakistan, the terminus is still too away to achieve the maximum output in shape of economic development, job creation, innovation and R and D commercialization. According to Higher Education Commission of Pakistan (2014), currently 8 university incubation centers are established with the objective to support the development of spinoffs and entrepreneurs access to desired financial and technical resources along with value added services such as intellectual property rights. Higher Education Commission of Pakistan is mainly responsible for expansion of incubation program at universities and associated research institutes of Pakistan. The criteria laid down by HEC, Pakistan for selecting

Table 4: General features of some BIs in Pakistan

Name	Founder	Mission	Year	Location	Facilities
TBIs		<ul style="list-style-type: none"> • Promote entrepreneurship culture • Create and support startups to become a profitable and self-sustainable enterprise. • Excel innovation capabilities • To commercialize the research • Academic and industrial development • To contribute in economic development 			<ul style="list-style-type: none"> • Networking • Infrastructure • Trainings, workshops, seminars, conferences • Linkages between academia and industry • Patenting • Intellectual property rights • Business support services • Consultancy • Managerial support • Financial support • Legal advice • Technical equipment • Process and product development technologies
Plan 9	Punjab information technology board		2012	Lahore	
Business incubation center	COMSATS institute of information and technology/HEC		2010	Islamabad	
Technology incubation center	National University of Science and Technology/inistry of Science and Technology		2005	Islamabad	
UIs					
Business incubation center (BIC)	University of agriculture/HEC		2009	Faisalabad	
Business incubation center (BIC)	University of engineering and technology/HEC		2010	Lahore	
Center for entrepreneurial leadership and incubation	IBA Sukkur/HEC		2012	Sukkur	
Small and medium enterprise development authority	Ministry of industry, Government of Pakistan		1998	Lahore	
National Industrial Parks Development and Management Company (NIP)	Ministry of Production, Government of Pakistan		2006	Karachi	
Pakistan council of scientific and industrial research (PCSIR) laboratories complex	Govt. of Pakistan		1953	Karachi	

PCSIR: Pakistan council of scientific and industrial research, NIP: National industrial parks, BIC: Business incubation center, BIs: Business incubators, SMEs: Small-medium enterprises

the universities for human and financial support to functionalize incubators at their locations are mainly include strong R and D activities, availability of entrepreneurial support and industrial area (see Table 4).

Pakistan remains less attractive region for researchers in studying and evaluating the incubators position for economic and entrepreneurship development. Although incubators in Pakistan are also acknowledged as a public policy tool for entrepreneurship development (Shahzad et al., 2012), still lacks quantitatively as

well as qualitatively with regard to other developing countries such as China, India, Malaysia, Thailand.

Fortunately, Pakistan has realized the significance of BIs. And similar to other developing countries, Pakistan is also institutive to support the incubation system for the economic uplift, reducing unemployment, promoting industrial culture, grooming leaders and establishing institutes. A delay with limited scope initiative, still appreciable and a positive sign for the country. In Pakistan, currently around 28 incubators of different types including

academic incubators, technology incubators and industrial incubators are functioning on the mission.

3. CONCLUSION

BIs are contributing to the developing economies. They are playing a key role in economic recovery and then also in smarter growth. Although the types of incubators in developing countries slightly vary, they have consensus on the objectives. The objectives are to achieve the economic development, reducing unemployment, uplifting standard of living, encouraging entrepreneurs, supporting creation and survival of new startups and fostering innovation to commercialize R and D. Relevantly, BIs are in early stages in developing countries. They are struggling to cope with the human and financial capital. This paper describes the BIs model in developing countries. Through the review of the published literature, the study supports the previous stance that well-planned and quality control with sustainable financial and human capital may help to nurture the economic development of developing countries. In future, this study by having theoretical foundation will help the authors to conduct more studies especially case studies and empirical studies and particularly in developing countries.

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