



Exploring the Barriers to the Development of Agricultural Businesses in Technology Incubators: A case Study of Razi University Incubator, Iran

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Abstract

The main objective of the present study was to explore the barriers to the development of agricultural businesses in the incubator of Razi University, Iran. The research was an applied study in terms of objective and an exploratory mixed method in terms of data collection methodology. The statistical population was composed of agricultural businesses and their personnel in the incubator of Razi University in the qualitative phase and of the agricultural experts in the quantitative phase, as well. The samples for both qualitative and quantitative phases were taken by purposive sampling method. Ten people were sampled for the qualitative phase, and three were sampled for the quantitative phase. In qualitative phase, data were collected by semi-structured interviews that were kept on until theoretical saturation. Then, the content of the interviews was analyzed to classify the data. In quantitative phase, a questionnaire was developed according to the results of the first phase and was administered to the experts. Data were analyzed by the Analytical Hierarchy process method using Expert Choice Software Package. The results revealed that in-incubator agricultural businesses are challenged with a lot of barriers to their development. They were classified in five main categories including knowledge-skill, structural-legal, business-production environment, support-facility limitations, and administrative-financial. Among these factors, support-facility limitations were ranked the first with relative importance (weight of 0.237).

Keywords:
business, development, incubator, content analysis, AHP

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INTRODUCTION

Human resources play the key role in sustainable development of the countries in the post-industrial era. The economic growth of the countries in recent years has been mainly the result of the relative accumulation of human capital. To attract, retain and increase human capital in a society, there should be a right platform in place for the growth of smart, creative and technological enterprises. An eminent example of such a platform is the science and technology incubators that can contribute greatly to the development of science, economy, and industries in countries by enabling synergies between these enterprises (Adibnia & Hosseiny, 2006). The establishment of technology incubators is one of the major supportive policies of the governments for entrepreneurship so that the entrepreneurs can pursue their own growth and wealth generation for the community by launching businesses (Tsai & Kuo, 2011). Incubator centers are creative and innovative organizations that can be used as a modern way to develop business space. Given their supportive role for emerging start-ups, these centers endeavor to provide supportive space for entrepreneurs in order to deploy value-generating, knowledge-based technological firms (Malekzadeh & Kazemi, 2011). The main goal of a business incubator is to encourage the development of new businesses within the local community. By assisting a local entrepreneur to start a company in the area, the community is likely to benefit from an increase in the number of available jobs in the area and the additional revenue that is brought to the city or town as a result of the new business activities. Both elements can help to revitalize a local economy and thus enhance the quality of life for everyone who lives and works in the area (Lesáková, 2012).

Given the importance and growing services of incubators in societies, special attention has been given in the literature to the assessment of the performance and success of policies supporting their establishment and the development of the SMEs in these incubators (Schwartz & Hornich, 2010). Universities can also resort to their educational and research capabilities to pave the way for the formation of knowledge-based firms, thereby facilitating the application of the skills learned by

their graduates (Aghajani & Talebnejad, 2011). Agricultural businesses are tussling with a lot of problems, and those operating in incubators are no exception when it comes to the development of their businesses. The main goal of science and technology parks and incubator centers is to help small, emerging start-ups to cope with the barriers and be enabled to compete in the marketplace. However, since these incubators in Iran are not fully developed yet, they have failed to thoroughly list the barriers. Accordingly, the present study aims to identify the barriers to the development of agricultural businesses operating in incubator center of Razi University.

Wonglimpiyarat (2016) studied the innovation incubators, university business incubators and technology transfer strategy in Thailand and concluded that planning in incubators is the key mechanism and policy for innovation support, and university business incubators should act as a link between academic realm and industry, fostering the interaction and promoting the effective use of academic research.

In a study on the role of university incubators in stimulating academic entrepreneurship, Stal et al. (2016) found that in spite of the fact that incubators preferred projects that had a high potential for interaction with universities, the firms resulting from the academic research were not in priority to be absorbed to incubators. Also, little attempt was made to recruit students, resulting in the failure of exploiting their potential for the transfer and commercialization of academic research.

In a study on firm survival with a focus on incubators and business characteristics, Mas-Verdú et al. (2015) found that when factors like innovation, appropriate size, exporting activities, and technology are combined, good conditions are provided for the survival of firms in incubators. This combination of incubators and the other noted factors is necessary to ensure the survival of the firms.

Tola and Vittoria (2014) focused on the diffusion of innovation to technology parks and incubators as an economic development model in a case study on Sardegna Ricerche and reported that planning of incubators provides a good chance for the establishment of firms and their support for their long-run survival and that they are considerably growing in number in contemporary

economy. According to Karimi et al. (2014) who worked on various mechanisms for the development of the SMEs, financial-facility, supportive, educational, administrative, and communicative mechanism were the most important ones for the development of the SMEs.

In a study on enabling factors for the strategic management of university business incubators, Somsuk and Laosirihongthong (2013) reached to four main categories of human, technology, financial and organizational resources containing 14 factors among which financial factors, managerial factors, and policy-making were prioritized the first.

Van Cann (2013) reported that universities and incubators are very effective on student entrepreneurs and the start of spin-offs so that entrepreneurship courses in universities influence entrepreneurial activities among graduates. Meanwhile, the main and most crucial role is assumed for incubators that can be considered a main, important indicator.

In a study on the factors inhibiting the development of entrepreneurship and the role of the government in its facilitation, Seyedi and Taghikhani (2011) concluded that the slow economic growth of private sector can be attributed to not only the lack of entrepreneurship culture but also the institutional and structural barriers in all three steps of an entrepreneurial activity. These steps are as below:

a. Barriers to entrepreneurship in training and preparation phase including higher education, more expectation from the government, risk aversion, incorrect view towards wealth, and neglect of in-service training and empowerment.

b. Lack of motivation in entrepreneurial mobility phase rising from the lack of proper behavior patterns, the lack of mental support network, the lack of specialized support network, and the lack of job security.

c. Barriers to entrepreneurship in growing phase (resources and opportunities) rooted in state monopoly and private property insecurity.

In a study on factors underpinning entrepreneurship development from the viewpoints of Tehran University graduates and entrepreneurs of Tehran, in which the researchers were trying to provide an appropriate curriculum for educational management and programming at bachelor's

level, Ouladian et al. (2010) listed these factors as personal control source, creativity, risk-taking, motivation for progress, educational process, attention to human resources and educational facilities, and educational goals and concepts.

Malekzadah and Kazemi (2011) conducted a case study on factors affecting the performance of small firms in Iranian Science and Technology Park incubators at initial growth stages. They reported that marketing capability and the attendance of managers in training courses had a clear and significant effect on their performance. Also, they stated that when measuring with profit and earning, performance was found to relate to two managerial dimensions of marketing and financial/operational.

MATERIALS AND METHODS

The present research was an applied study in terms of objective and an exploratory mixed method in terms of data collection methodology. In qualitative phase, data were collected by semi-structured interviews that were kept on until theoretical saturation which occurred in the tenth interview. Then, the content of the interviews was analyzed to classify the data.

In quantitative phase, a questionnaire was developed according to the results of the first phase. Data were analyzed and factors were prioritized by the AHP method using Expert Choice Software Package. The content analysis method is based on the premise that by analyzing linguistic messages, one can discover the meanings, priorities, attitudes, and ways to understand world organization. This procedure is highly flexible, making it appropriate for variable conditions (Tabrizi, 2014).

Analytic Hierarchy Process (AHP) is a powerful multi-criteria decision-making technique that was introduced by Thomas Saaty, a professor at the University of Pittsburgh, in 1980 and was extensively welcomed by academia in spite of some criticism. This method reflects the natural behavior and thinking of human being and enables the decision maker to present the interactions between different criteria in complex, non-structured situations. AHP is one of the most comprehensive processes designed for decision making with multiple criteria because it allows formulating the problem as a hierarchy

and including different quantitative and qualitative criteria in the problem (Ataei, 2014). The method allows sensitivity analysis, and it is based on pairwise comparison of criteria and sub-criteria which facilitates the judgments and calculations and reveals the consistency or inconsistency of the decisions (Ghodsipour, 2012).

The population was composed of the incubator of Razi University including all in-incubator agricultural businesses and their personnel in the qual-

itative phase and of all agricultural experts in the quantitative phase. Purposive sampling practice was used in both qualitative and quantitative phases. Ten people were sampled for qualitative phase, and three were sampled for quantitative phase.

RESULTS

Analysis of interviews

When interviews were finished and the data were collected, they were analyzed, encoded,

Table 1

Barriers to the Development of Businesses in Razi University Incubator.

Categories	Conceptual codes	Sr. No
Knowledge-skill	Regular attendance of businesses in technical courses held by the incubator and the few number of courses	1
	The lack of skill and expertise in the personnel of the businesses and the shortage of professional people with labor market literacy	2
	Unawareness of regulations enforced for business space	3
Structural-legal	Businesses' inadequate awareness of the tasks of incubator and their unrealistic expectations from the incubator	4
	The weakness of the units in the use of information technology and e-commerce and its capacities to promote the sale of products/services	5
Business-production environment	The time-consuming procedure to obtain licenses for the production and service provision and the lack of agility and resilience of the government for swift decision-making to support businesses	1
	Inappropriate business rules and complex regulations for budget allocation to the businesses	2
	The ambiguous organizational position of incubator in the organizational chart of the university which is a barrier to budget allocation due to unknown position in organization hierarchy and the accountability to upstream managers	3
Support-facility limitations	The lack of delegating authority to incubator managers for the spending of the budget dedicated by the Ministry of Science to incubators.	4
	The blocking of the budget allocated by the Ministry of Science and its unavailability for solving the problems of incubators because of the poor regulations and directives	5
Administrative-financial	The sanctions that prevent the purchase of equipment for the development of agricultural businesses	1
	High costs of adoption of new technologies and high prices of products/services owing to imperfections of supply chain	2
	Traditional attitudes towards business in society which had led people to give less importance to knowledge-based products/services of agricultural businesses	3
	Low quality of products/services of the businesses and their inability to compete with products/services available in marketplace	4
	The lack of support of incubator businesses by university officials, the Ministry of Science, and other agencies	1
	The lack of visiting the businesses by the official of the Ministry of Science to learn their problems	2
	The lack of facilities like equipment, supplies, and laboratories in incubator and the small, inappropriate space dedicated to the businesses, especially agricultural businesses	3
	The lack of monitoring the businesses and their activities and problems after their recruitment	4
	The failure in informing and promoting about incubator with respect to the activities of businesses and their introduction to public and private organization and public people	5
	The adoption of poor and uneconomical ideas in incubator	1
The lack of perspective, mission statement, and appropriate agenda	2	
Low capacity to recruit businesses for loans and capital financing	3	
Insufficient work experience and financial ability to participate in biddings	4	
The weakness of incubator officials to solve the problems of the businesses and to monitor their performance	5	

Table 2
Relative Weight of Criteria and Sub-Criteria

Criteria	Relative weight	Sub-criteria	Relative weight	IR
Knowledge-skill	0.198	KS ₁	0.198	0.03
		KS ₂	0.277	
		KS ₃	0.164	
		KS ₄	0.188	
		KS ₅	0.171	
Structural-legal	0.206	SL ₁	0.15	0.03
		SL ₂	0.233	
		SL ₃	0.183	
		SL ₄	0.223	
		SL ₅	0.210	
Business-production environment	0.151	BPE ₁	0.186	0.01
		BPE ₂	0.257	
		BPE ₃	0.203	
		BPE ₄	0.354	
Support-facility limitations	0.237	SFL ₁	0.193	0.04
		SFL ₂	0.161	
		SFL ₃	0.232	
		SFL ₄	0.231	
		SFL ₅	0.182	
Administrative-financial	0.208	AF ₁	0.195	0.04
		AF ₂	0.216	
		AF ₃	0.165	
		AF ₄	0.173	
		AF ₅	0.25	

and categorized by content analysis method. Finally, 24 codes (sub-criteria) and five general categories (criteria) were yielded after eliminating repetitive codes and merging closely related codes. Table 1 presents the categories and the pertaining codes.

Table 2 presents the analysis of decisions and the pairwise comparisons by three agriculture experts. The pairwise comparison questionnaires were analyzed by Expert Choice Software Package, according to which it was found that 'support-facility limitations' was the most important and 'business and production environment' was the least important criteria with the relative weights of 0.237 and 0.151, respectively. Since the inconsistency rate (IR) of decisions was <0.1 for all criteria, we can say that they were consistent.

DISCUSSION AND CONCLUSION

Incubators are a good place for fostering and preparing startups to enter the domestic or even

international markets. After several years in these incubators, these businesses may leave the incubators with a record of success or failure. To have a desirable output, incubators should plan to identify the barriers and driving forces of the development of these businesses and to help their viability.

Agricultural businesses are also a part of the businesses in incubators, and they are struggling with a lot of challenges to develop and get prepared to enter the market and compete with highly capable businesses. This study revealed that these businesses are faced with shortcomings and obstacles to the development of their businesses. The studied population believed that agricultural businesses are challenged with five main categories of barriers including knowledge-skill, structural-legal, business-production environment, support-facility limitations, and administrative-financial.

Among these categories, the experts mentioned

'support-facility limitations' to be the first priority and 'business-production environment' to be the last priority with relative weights of 0.237 and 0.151, respectively. This shows that agricultural businesses of incubators need support and facility more than anything else to be able to develop their activities because they are in short of hardware and software facilities since they are at the beginning of their life. Lacking facilities such as laboratory, workshop, supplies, and adequate raw materials, these startups are destined to fail in concluding their research and commercializing their products. Indeed, one can claim that facilities and laboratories form the foundation of an agricultural business. Nonetheless, financial and managerial issues are of high importance too. This reflects the fact that agricultural businesses must be able to acquire the required resources and skills in order to survive and keep working. Other main categories are important for the development of agricultural businesses too. They should be considered with respect to their priorities and their ranks.

We need sound planning and structuring as well as the delegation of authority, monitoring, and empowerment as well as skill training in order to create an atmosphere consistent with the rationale of incubators and the development of in-incubator businesses. All in all, given the rather short history of incubation establishment, sound decisions are required to cope with their drawbacks and to improve their strengths by the official at the macro level.

RECOMMENDATIONS

According to the findings, the following recommendations can be put forth:

1. Deploying an efficient system for the performance appraisal of in-incubator agricultural businesses in terms of such criteria as knowledge level, value creation, and income generation.
2. Meeting hardware requirements by the supply of facilities and software requirements by holding technical courses and empowering the businesses.
3. Establishing a proper monitoring system, developing an agile and resilient organizational structure, and delegating the authority.

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