Understanding The Triple Helix Model from The Perspective of the Developing Country: A Demand or A Challange for Indonesian Case Study?

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Abstract

This paper is based on the conceptual and theoretical analysis regarding the triple helix model as the demand or a challenge for developing country, particularly the Indonesian case study under investigation. The paper will discuss the essential stages required to establish a robust synergy between three different actors: the university, the industry and the government alongside the local context in Indonesia, mainly the role of university in providing help for SMEs in Indonesia together with the government or other institutional developing agencies. This paper will also explore the promotion of SMEs by clustering approach as the fact that Indonesian SMEs are scattered across the region.

Furthermore, this paper will analyse the potential strengths and weaknesses within Indonesian SMEs, of setting up appropriate strategic movements for the future of the triple helix paradigm itself. It will start with the lessons, learned from the implementation of the triple helix implementation in the developed countries then it will look at the local Indonesian context in order to bridge the gaps within the actors involved.

Key words: Triple Helix, Cluster Approach, SMEs (Small and Medium Sized Enterprises), University – Industry - Government Relations

Introduction

The phenomenon of the triple helix system has been recognised widely in developed countries (Etzkowitz and Mello 1994, Turpin et al.1993, Shinn1997, Leydersdoff 1997) as it has emerged from the needs of universities to work closely together with the industry (i.e. Double Helix) in order to improve the knowledge spillovers (Marshall 1920) and to maintain the sustainable development of the industry-university integration. Moreover, it is necessary for government to support this synergy as it will play the role of policy maker providing the necessary tools to encourage local region. The tools could be based on innovative policy or on incentives for the university and industry to develop on their research and development activities.

However, the new triple helix paradigm has been recognised as a new concept for some developing countries. Although, they have been developing this kind of joint partnership in 1990s (Tambunan 2005) but the progress has been considered to be relatively slow compared with similar partnerships in the US and some of the Western Europe countries (Leydesdorff 1997).

Therefore, in order to understand the triple helix paradigm from the viewpoint of the developing country, it is necessary to understand the story from the developed countries including the risks and the pitfalls which have already occurred during the implementation stage. Then, it might be beneficial for developing countries to take these

lessons as benchmarks in order to improve the existing triple helix embryo(s) that are arising in some of the developing countries.

The Emergence of the Triple Helix

The triple helix system has been said to be positive synergy among the three different actors in knowledge spillovers. The model engages the university as the centre of excellent with its academic-based research and development activities, industry as the provider of the customer demand based on its commercial activities as well as research and development, and the government as a policy maker. The integration of these different actors lies at the heart of the triple helix system that ideally will increase knowledge spillovers in the region; thus, increasing the competitive advantage of economic development, either regional or national.

The triple helix system was introduced by Professor Henry Etzkowitz who studied the importance of joining these three different actors in the economic activities to improve the regional development constantly. The Triple helix provides the ideal way for a traditional university to develop into an entrepreneurial university.

Such as 'hands-on' strategy, however, requires a greater science and technology policy capacity on the part of the state, industry and academia, since the judgements of the level and type of intervention in particular areas become more critical (Etzkowitz 1997). Therefore, the central issues are the synergy among the three different actors in societies reflecting different traditions of political economy, and different levels and types of economic development, including the macro and micro economics of each particular country.

Concept of the Cluster and Its Benefit for Indonesian SMEs

A cluster is a geographically proximate group of interconnected companies and association institution in particular field, linked by communalities and complementarities (Porter 1998). Furthermore, Porter (1998) argues that geographic scope of cluster ranges from a region, a state, or even a single city nearby or neighbouring countries which also relates to the distance over which informational, transactional, incentives, and other efficiencies occur.

Thus, cluster encompass an array of linked industries and other entities important to competition which include suppliers of specialised inputs such as components, machinery, and services as well as providers of specialized infrastructure. Additionally, many clusters include governmental and other institutions (e.g., universities, think thanks, vocational training providers, standards-setting agencies, trade association) to facilitate specialized training, education, information, research, and technical support.

Clusters occur in many types of industries, in smaller fields, even in some local industries, such as restaurant, car dealers, or antique shops. They exist in large and small economies, in rural and urban areas, and at several geographic levels (e.g., nations, states, metropolitan, regions, and cities). Moreover, cluster arises in both advanced and developing economies, although cluster in advanced economies tend to be far more developed (Porter 1998).

However, SMEs particularly in developing countries for instance Indonesia is having difficulties in capturing these opportunities that require products with better quality and prices and good service, after sales service, larger production quantities, and homogeneous product standards (Tambunan 2005, Hill 2001). Therefore, many enterprises experience difficulties in achieving economies of scale, and they also experience significant obstacles to internalizing functions.

Accordingly, for SMEs, clustering is believed to offer opportunities to engage in a wide array of domestic linkages between users and producers and between the knowledge producing sector (universities and R&D institutes) and the goods and services producing sectors of an economy. Also, clustering allows SMEs to grow in risk able steps by sharing the costs and risks through collaboration.

Knowing and understanding clusters are the value to region only if that knowledge leads to actions that grow economies and raise standards of living. Unfortunately, there is no single recipe for less favoured regions to follow that will meet the needs of all clusters. But there is a menu of actions from which to choose. The choices regions make depend on many factors, including geography, stage of development, resource constraints, special societal needs, clusters priorities, market imperfections, and local preferences.

Moreover, Porter (2000) explains that firms, either small or large, within cluster are able to more clearly and rapidly perceive new buyer needs. By contrast, the isolated firm faces higher costs and steeper impediments to assembling insight as well as a greater need to create knowledge in house (Audretsch and Feldman 1996, Harrison, Kelley, and Grant, 1996, Jaffe et.al. 1993).

The Indonesian Context

The Three Elements in Indonesian Higher Education: Perspective from University

Universities have a unique role to play in this emerging environment particularly in the economic growth of the communities in which they exist (Gnuschke 2001, Hill 2001). Gnuschke (2001) believes that no great city exists without a great university where centre of economic activity and intellectual activity go hand in hand to support each other. In

contrast to the past, when university scholars were discouraged from becoming entrepreneurs, a new generation of university faculty is now closing the gap between the world of academic scholarship and economic activity. Therefore, the evolving university as centre of intellectual property can be seen as an engine for economic growth and prosperity (Gnuschke 2001).

Additionally, according to Gnuschke (2001), some universities have obviously responded by recognizing the value of campus-based intellectual activity, engaging in business partnerships from the commercial activities of their faculty and focusing their research activities on issues that have both academic and commercial applications.

There are, however, some universities which are locked in traditional structures, have not encouraged and even to discourage the development of entrepreneurial activities. They seem to fear that the traditional academic and research mission of the university either will be tainted or overrun by the for-profit component of entrepreneurial adventures (Gnuschke 2001).

Nevertheless, the truth probably lies somewhere in between these extremes as they can be complementary. Entrepreneurial activities can help to provide funding for both applied and theoretical research in order to balance and effectively manage the competing interests of for-profit or traditional academic activities (Gnuschke 2001). For that reason, the all entities, both universities and their partners will all benefit from the joint activities in which they are involved with.

Accordingly, higher education must act in response to this change not simply by improving quality through proper implementation of existing standards, but more fundamentally, as well as reviewing the relevance of the standards that have been used. It is the time to question the beliefs that the quality of higher education can be assured by meeting the criteria and following the procedures established by the Directorate General of Higher Education (DIKTI). Therefore through the TRI DHARMA PERGURUAN TINGGI, it is planned to improve the quality of the university's role in advancing the education in Indonesia alongside the industry sector and the government.

The university in Indonesia has three essential roles in term of delivering education to all Indonesian regions. The roles are called TRI DHARMA PERGURUAN TINGGI or The Three Elements of Indonesian Higher Education, which entail education, research and community service. Ideally, the university with its TRI DHARMA will work together in the company of the industry as a business partner to enhance the public society in developing productive business networks (either small or medium scale). The government encourages universities and industry to keep up this work by providing relevant policies and incentives (i.e. government loans)

Education - Research/study

The purpose of improvement in the teaching-learning process is to increase its effectiveness in accommodating the development of both the students and the faculty members' skills in learning and implementing management concepts and tools. Research should produce teaching materials, which also should be different from the materials used for academic program (Soehendro 1998). Therefore, the system is expected to develop the expertise and commitment to produce teaching-learning materials, including cases, exercises/games/management laboratory, as well as innovation in methodology (Peniwati 2000).

Education - Community service

The activities in community service should generate a sense of priority for specific knowledge relevant for the students to master, as well as improvisation and innovative applications of management concepts (Peniwati 2000). Therefore, education is also accountable for developing skills in simplifying and applying knowledge based on context, as well as communication skills required for delivering training, consulting, and facilitating the process of organizational change (Soehendro 1998)

Community service - Research/study

Peniwati (2000) believes that carrying out community service on business terms would better ensure relevance to the needs of the community as well as high quality work of the faculty members. More essentially, it would ensure lower priced programme because of the cost sharing involved. Therefore, activities in community service would identify topics or problems that need to be studied, as well as data and information, which should be used to conduct this study. The research outcome must be disseminated to the community.

Small and Medium-Sized Enterprises' (SMEs) Clusters in Indonesia: Perspective from Government

SMES are a clear and consistently stated Indonesian government priority. They feature prominently in key government documents, such as five-year plans (Repelita), the Broad Outlines of Government Policy (GBHN), and many official statements (Hill 2001). In addition, the government has planned VISI IPTEK 2025 or Indonesian Knowledge and

Technology Vision 2025 as the ideal outcome for the national development and prosperity of the Indonesian people (see appendices for Innovation Policy).

Indonesia values SMEs for being a significant economic driver as well as those drivers provided by Larger Enterprise activities. Indonesia recognizes SMEs as one of the significant economic drivers for enhancing its economic development as can be seen in the table 1 (see appendices), in 2003, SMEs could have 99.25% of the total industry in Indonesia. In term of employment opportunities, SMEs have absorbed 59.82% of the total industrial employment in Indonesia. It is therefore not a surprise that SMEs receive a lot of attention in Indonesia (Tambunan 2005).

SMEs are seen as a vehicle for promoting pribumi (indigenous Indonesian) business and therefore as a means of asset redistribution along ethic lines. It is most likely because ethnic relations are more responsive in Indonesia than in any other East Asian country that the gap between official pronouncements and implementation with regard to SMEs is the widest (Berry 2001).

More generally, there is a disjunction between the standard economist's approaches to policy intervention, which emphasizes market-oriented solutions as the key to rapid economic development (aside from specific justifications for intervention). As a result, it cannot be assumed that the same sorts of policies that are drawn up for larger industrial units will necessarily apply to SMEs.

Additionally, international experience suggests that an efficient SME sector is conducive to rapid industrial growth and a flexible industrial structure (Berry 2001). A particular strand of this argument emphasizes the importance of a well-developed SME sector in underpinning the key electronics, machine, goods, and automotive industries through the establishment of sub-contracting networks.

Furthermore, there is a particular current interest in SMEs in Indonesia since these firms appear to have weathered the economic crisis of 1997-98 better than larger industrial units. This proposition appears to be true both for intra country comparisons (i.e., large and small firms within a given country) and across economies (e.g., the Korea-Taiwan comparison) (Tambunan 2005).

SME clusters can be found in all provinces, and most of them are located in rural areas. The clusters were established naturally as traditional activities of local communities whose production of specific products have long been proceeding and the workers have special skills in making such products (Tambunan 2005). Clusters of batik, the traditional Indonesian textile, within the District of Java Island (i.e. Yogyakarta, Pekalongan, Surakarta and Tasikmalaya) are one of the examples that have long been existence. According to the table 2 (see appendices), in 2003 most of the SMEs have been concentrated in Java region with 69,05% compared to Sumatera region with less than 12% and less than 1 % for Maluku and Papua in East region. In Borneo, SMEs

concentrated less than 5%. Accordingly, due to these facts, Indonesian government must admit that there are imbalance distributions of economic development in each region.

Additionally, Tambunan (2005) describes the importance of clustering not only for the development of SMEs in the cluster, but also for the development of villages/towns in Indonesia. He gave the example of how the clustering of rattan furniture producers has absorbed an entire village in Tegal Wangi, West Java and created several small-scale industrial activities in neighbouring hamlets Similar evidence from wood furniture in Jepara, Central Java when the grow of this cluster in 1980s had transformed the town into a thriving commercial centre with many furniture showrooms and factories, modern hotels, new commercial banks, supermarkets, and European restaurants. Therefore, clustering is indeed important for the development of SMEs as well as for the regions, social and economic development.

Nevertheless, it has been found that not all the clusters within District of Java Island are successful. Some of them have found it difficult to thrive because of market competition particularly those enterprises which have been established in rural areas. Therefore, it is urgent for government and university to reach these rural clusters in order to get involved in building up a cluster approach.

Clusters in Indonesia can be classified into four types, according to their level of development. The data from Central Bureau of Statistics explain that the first type is a*rtisinal*, indicating that the process of clustering is still at an 'infant' stage. The second type is a*ctive*; indicating that it has developed rapidly in terms of skill improvement, technological upgrading, and successful penetration of domestic and export markets. Examples of this cluster are roof tiles clusters, metal casting clusters, shuttle- cock clusters and shoe clusters. The third type is *dynamic*, indicating the decisive role of leading/pioneering firms, usually larger and faster growing firms, to manage a large and differentiated set of relationships between firms and institutions within and outside the clusters. Examples of this type are clove cigarette clusters in Kudus, tea-processing in Slawi, and tourism clusters in Bali. In the case of clove cigarette clusters, their products are able to outperform products from Phillip Morris and BAT. Tea-processing clusters led by big companies such as Sosro have grown to become market leaders in the Indonesian soft drink market, leaving giant Coca-Cola behind (Tambunan 2005).

Clusters of the fourth type are more advanced, more developed and more complex than the previous types. However, there are two of the well-known cluster agglomerations in Indonesia. The first is in Yogyakarta - Solo area with its tourism, furniture and interior decoration, metal processing, textile and leather goods, which all mutually benefit each other. The second one is Bali, known as a tourist destination with SMEs which produce traditional handicraft, furniture and interior goods, silver jewellery, and paintings.

Bridging the Gaps amongst University, Government and Industry to Support SMEs in Indonesian Context

The role of the universities in developing national industry, specifically small and medium enterprises (SMEs) is essential as the strategy to revitalize Indonesian universities to transfer know-how from laboratory to industry. The ineffective internal policy, weak funding base and lack ties with private sectors are the main problems of promoting SMEs in Indonesia through government and University (Hill 2001).

Researchers within universities are required to be the expert on their field and the utilization of the equipment. Consequently, to contribute technology transfer, research institutions (universities and research centres) have two main functions as 1) technological supporter for SMEs within areas and 2) research and development centre.

From the university perspective, SMEs development through a cluster approach is important because it is more effective and more efficient for the other institutions (i.e. university itself, government and other international agencies) to provide technical and management support, training, and general facilities to a group of firms located in one place than to individual firms in dispersed locations. Also, a cluster approach in a region will promote the development of other local sectors in that region, and hence promote the economic growth of the region.

The participation of the university in promoting SMEs is certainly helpful in implementing SMEs cluster development scheme for the regional government; therefore, with the support of university and the industry, which is located nearby the SMEs, the chance for the success of SMEs through cluster approach is higher than targeting individual forms in dispersed areas. A university does not generally operate on pure-free market competitive principles. Nevertheless, they have been found in many countries to actively participate and to contribute to marketing and production among the SMEs, as well as in training; these institutions contributed significantly to the cluster's growth and development (Tambunan 2005).

In Indonesia, particularly on Java Island, the strong role of the university has been played by Institut Teknologi Bandung (ITB) or Bandung Institution of Technology. It has a particular division in supporting SMEs through Pusat Inkubator Bisnis (PIB) or Centre of Business Incubator. This division has been developing SMEs particularly in the District of Java with the help of the government and other international supporting development agency (i.e. Japan International Co-operation Agency, Asian Development Bank, World Bank) alongside the Industry for providing practical marketing advice and helping SMEs to expand their local market.

This division is carried out by lecturers, researchers, and students in their own field of study and expertise. Laboratories are provided for these activities. The Business Incubator, together with the Institute of Research and Community Empowerment in ITB,

facilitate and coordinate unit that provide services such as research both for interest of society for internal programme; education and training for improving quality of human resources; consultation services which conduct activities of consultation involving: studies, surveys, planning and design, physical and service implementation, and project management supervision; and Intellectual Property Right Management to give consultation services in managing an intellectual assets, to conduct a training for business organization/enterprises in managing intellectual asset.

In conjunction with ITB, Universitas Gadjah Mada (UGM) or Gadjah Mada University has played a central role to support SMEs alongside District of Java Island particularly in Central Java where there are batik and furniture clusters. Gadjah Mada University has an established division known as the institute for community service as a part of its business incubation service. In partnership with other international supporting development agencies (i.e. Japan International Co-operation Agency and Asian Development Bank) and support from local government, Gadjah Mada University has been actively promoting SMEs by being their intermediary to deal with these international institutions particularly in business plan development and technical assistance funded by these international institutions.

In supporting SMEs toward clusters, ITB and Gadjah Mada University through their particular divisions have found that there are several considerations to take into account which can undermine the development of SMEs in a cluster approach. These considerations can cause significant failure to the development of SMEs if they are not tackled. Therefore, these universities together with SMEs have been actively engaging with the government to support this cluster approach by policy.

Furthermore, the government should provide a comprehensive development package, including technical upgrading through the provision of a common service facilities, export training and investment in the improvement of regional infrastructures (container facilities, roads, telephone connection) that will help the clusters, particularly those in rural areas, to gradually develop their markets both local and export.

The triple helix model is that the university-industries-government interaction should also improve the conditions for innovation in a knowledge-based society. These universities, particularly ITB, with its special expertise in technology, have been trying to create applied technology in terms of devices for local SMEs together with industry. ITB has been helping SMEs toward technical assistance funded by certain industry (mainly the automotive industry) to produce spare part for this industry (Irfan et al. 2004). As a result, this joint partnership has mutually benefited all involved.

In addition, ITB created a new intelligence system to promote SMEs known as CEVIC Centre (Centre of Technology Watch and Competitive Intelligence). Researchers in ITB believe the fact that SMEs in Indonesia must be more sensitive to the use of information. The CEVIC will concentrate its activities on research and development in the regional strategic industry sectors which aim to play a key role in promoting ITB itself as a higher

educational institution as well as a business partner with SMEs and industry. CEVIC centre is designed to provide a commercial interface between the industries and other institutions under ITB which can help SMEs get access to necessary information and create a shared of knowledge for action. This could be very important particularly for very large and widely distributed countries like Indonesia (5000 km long and more than 18,000 islands). Platforms for the creation of knowledge will certainly help people particularly SMEs to think differently and speed up their entry to the information society (Irfan et al. 2004)

However, universities in Indonesia still have difficulties in delivering technology transfer to be used by SMEs. In Indonesian context, there are two models of technology transfer from university. First is the indirect mode: creating graduates who will bring knowledge, skills and entrepreneurial attitude to their later jobs and their community. The second is the direct mode: technology transfer directly from university to industry (Hill 2001, Peniwati 2000, Berry 2001).

Additionally, Indonesia faces difficulty in technology transfer between researchers and industry. As the result, they could not perform to transfer their knowledge properly. Universities in Indonesia have not created researches based community. Universities have only been stressing on education activity much more than research. Many universities still have not addressed a priority for research.

In general, universities in Indonesia are facing several major problems in R & D. The first is ineffective internal policy such as education curriculum at university, high load of the lecture, improper evaluation system etc. As a result, many researchers in university could not do research because of the high load for the lecture. The second is weak funding base which affects the capability to hire qualified staff. The third problem is the lack of integration with private sector (Berry 2001). Accordingly, R&D programmes are not responding to demand from firms and industries but are rather performing the ideas of politicians and bureaucrats.

Therefore, it is essential for the researcher to be aware of their roles in engaging with the SMEs for transferring their engineering frontier technology (laborator's inventions) to economic knowledge (industries such as SMEs). Researchers should understand technological problems in SMEs located in their area. Visiting and investigating them actively by researchers may solve their problems. Accordingly, technologies developed in universities are match with technologies needed in SMEs (technology demand side). Technology transfer will be accomplished once researchers have possessed technology and mastered in utilization of equipment. For that reason, getting the SMEs involved in training course will speed up the process of technology transfer as some of them do not be familiar with universities. Experientially, many industries are closed and not co-operated with such activities.

In fact, universities have such kind of programme where students must get training from an industry to fulfil their credit for graduation. Nevertheless, their assistance (researcher

or lecturer) do not go with them to know the real situation of industry where they got the training. The training result is also not followed up. Essentially, such good opportunity should be taken as a momentum to have beneficial relationship among SMEs and institutions (Berry 2001).

Conclusion

Universities contain much of the formal and organizational technology needed for economic development. Mutual and joint partnerships are where universities and economic enterprises have collaborated and focused on particular issue due to economic and social concern in developing country.

The facts in this Indonesian case study have been presented to describe in detail the role of the university in dealing with SMEs, particularly in promoting the cluster approach to enhance their capability technically and economically. Most official statements emphasize the importance of SMEs as a means of generating employment, achieving greater equality through a more diverse ownership structure in business, promoting rural and regional development, providing a basis for entrepreneurial development, and redressing the perceived ethic imbalance in business ownership.

As SMEs in Indonesia are regarded as one of the economic drivers in addition to the Large Enterprises (LEs); hence, it is beneficial to engage universities together with other institutions (i.e. industry, government, international supporting development agencies) to provide technical and other particular areas of interest in order to upgrade SMEs to be more competitive either in local or global market competition. Therefore, Indonesia must strengthen the national industries and to be able to stay alive toward globalization era, except by give a significant change in technological capability in the national industries.

The triple helix originated as a model of discontinuous innovation and it is defined as the ability to renew innovation systems across technological paradigms (Etzkowitz and de Mello 2004). In developing country, universities increasingly need the ability to transfer existing knowledge to lower levels on the technology scale within their societies and also to provide inputs into the development of high-level technologies that have been done through training process complemented by consulting, incubation and transfer capabilities. Therefore, the triple helix system places the role of the academic sphere in relation to small and medium-sized enterprises to engage in joint networking with other supporting institutions.

Indonesia has been trying to engage all actors to start this bottom-up model of innovation, where university, industries (either SMEs or LEs) and government together support

regional development and prosperity. The triple helix thesis is that this university-industries-government interaction is the key to improving the condition for innovation in a knowledge-based society where the university as a source of new knowledge and technology; industries are the locus of production; and the government as the source of contractual relations that guarantee stable interactions and exchange (Etzkowitz and de Mello 2004). However, this complementary concept is introduced in developed countries; therefore, to make it as sensible concept for developing countries such as Indonesia, it is necessary to construct a vigorous science and technology infrastructure linked to the productive structure of the society (Etzkowitz and de Mello 2004). Then the outcome can eventually be expected.

The Triple Helix and cluster approach have been regarded as suitable and practicable approaches for Indonesia where the SMEs are spread and located in diverse areas. Therefore, it will be effective and efficient for universities and other institutions if they want to engage and develop these clusters by providing technical assistance or service. In conjunction with the cluster approach, the triple helix concept is a complementary thesis in supporting this programme. Implementation of the Triple helix requires active role from university, industry and government to support each other in order to enhance economic and social development in the developing countries. In particular, Indonesian universities should involve actively in bridging the gaps between government and other international supporting development agencies for developing SMEs.

The role of the university in promoting SMEs in Indonesia has been represented by Institute Teknologi Bandung (ITB) or Bandung of Technology Institute and Universitas Gadjah Mada or University of Gadjah Mada. These universities have particular division as a community based research and business incubation to serve SMEs in the District of Java Island. However, the role of government is also significant in order to provide the necessary policy and infrastructure which can be worth for the development of SME clusters in Indonesia.

Promoting the triple helix and cluster approach for SMEs is not a trouble-free and short programme as it will involve many actors from different backgrounds. It must be taken into account that a joint programme should be of value for all actors involved, based on consensus among them, all entities should support each other in order to achieve economic and social development within the developing country as different countries, (either developed or developing) experience different cases because of different local contexts. Consequently, different approaches to applying the triple helix in different countries should be considered. Other essential roles in technology transfer are good government and institutional policies by giving priority to research and education mission and responsive non-bureaucratic. Technology transfer is a by-product that should not distort the long-range mission of institutions.

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