

## QUADRUPLE HELIX INNOVATION MODEL FOR RURAL DEVELOPMENT: THE CASE OF SUKARAJA TOURIST VILLAGE IN INDONESIA

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### ABSTRACT

*Tourist villages in Indonesia have a very important role in rural development. The village is the smallest unit of rural development in Indonesia that has its own autonomy in management. Even though there are many innovation models have been well developed in some parts of the world, but it has yet to be implemented in Indonesia. Quadruple helix innovation model has been introduced in developed countries to develop their countries. Thus, this model is seen suitable to be adapted in some villages in Indonesia to achieve prosperity and to improve the welfare of Indonesian society. In general, this research is aimed to adapt the quadruple helix innovation model for the tourist village in Tasikmalaya, West Java, Indonesia. Specifically, this research is aimed to (1) identify the driver for the village development, (2) examine the process of village development, and (3) adapt a model of the village process development. The design for this research is a case study. This case study is conducted in a Sukaraja tourist village in Tasikmalaya, West Java that is chosen purposely. Sukaraja Village is chosen as a study location because it has economic potential in terms of tourism and handicrafts. From the existing condition of socioeconomic and cultural in Sukaraja Village this study adapts a quadruple helix innovation model using soft system methodology to achieve prosperity and to improve the welfare of the village community. The results of this study show that (1) the driver for the village development is a tourism industry that have to manage professionally, therefore have to run by village-owned enterprise (2) the process of village development is a holistic process and cannot be done just by single institution, and (3) the model of process development called a quadruple helix innovation model, which is using synergies from four institutions in the village, there are the village government, the village industries, the village education system and the village industrial community. As a whole, the quadruple helix innovation model can be used to improve village welfare communities and in turn will enhance the prosperity of Indonesian society as a whole.*

**Keywords:** *Regional Innovation System, Village Innovation Model, Quadruple Helix, Soft System Methodology*

## INTRODUCTION

The village is the smallest unit of local government areas in Indonesia, which has the right to autonomy in the management of its territory, hence the efforts to develop the village became very important. If all villages in Indonesia have been developed independently and continuously, it is expected that the entire society will prosper.

Develop a region, as well as a village, can be done by implementing regional innovation system. The regional innovation system can be defined as a system stimulating innovation capabilities of firms in a region so as to enhance the region's growth potential and regional competitiveness (Lim, 2006). The model of regional innovation systems that often used, among others, are triple helix innovation model and quadruple helix innovation model. Both of these innovation models have the concept that innovation emerges through a process of interaction of the components that make up the helix. Interaction is a social process involving feedback at different stages of knowledge development, diffusion and deployment to stimulate innovation in a region (Cooke *et al.* 1998).

Triple helix model is an innovation model pioneered by Etzkowitz and Leydesdorff (1995) that adopt a spiral shape of the three components, namely industry, government, and universities.

Then the researchers added one more helix such as the community (Yawson, 2009), community-based media (Carayannis & Campbell, 2012) and so forth, and formed a quadruple helix.

Implementing an innovation model in a region, i.e a village, requires an operational model that fits into the area where the model is implemented. Especially because the village has its own characteristics that are not owned by a wider area, for example, there are no higher education institutions, industry owned by the village is a small industry with low technology and also rural communities have a strong social relationship. Therefore, it needs to develop a model of innovation that is appropriate for the village to be implemented in the village.

Generally, this study aimed to design an innovation model that is appropriate to be applied in villages in Indonesia based on their economic potential which is owned by the village. This case study focuses on the village that particularly has potential in the field of rural tourism and craft industry in West Java Province. The site selection is in accordance with the Fifth Mission of Jawa Barat province (2013-2018) that is: Improve Social Life, Art and Culture, Role of Youth and Sports and the Tourism Development in Frame of Local Wisdom (Pemerintah Provinsi Jawa Barat, 2013)

## OBJECTIVES

The objective of this study is to develop a village innovation model that corresponds to the villages in the province of West Java that has the potential of rural tourism and craft industry. This paper is aimed to (1) identify the driver for the village development, (2) examines the process of village development (3) describe the roles of the institutions involved and their synergies, and (4) develop a model of the village process development.

## METHODOLOGY

This research took place at Sukaruas Village, Tasikmalaya District in the West Java Province. This research conducted in two stages. The first stage is to find comparable data from the developed villages that have similar economic potential, and obtained from five villages in the Central Java province and a village in the West Java province. The data obtained is then used as consideration in determining the driver of innovation and in the modelling process. The data analysis and modeling process is done by using soft system methodology. Soft system methodology suitable to be used as a method of modelling the social processes. (Widjajani, 2011).

## LITERATURE REVIEW

The development of models of innovation cannot be separated from the human desire to be able to develop the

welfare of a region. Innovation models have evolved to the present, from the linear model of innovation to quadruple helix innovation model, quintuple, and n-tuple helix.

The linear innovation model has emerged from World War II (Edquist & Hommen, 1999). A linear relationship of the innovation process means that science leads to technology and technology intended to meet the needs of the market. This includes commercial research and development of applied science with a unidirectional process of fundamental scientific research to commercial applications. In this approach, innovation is seen as a great leap of knowledge achieved by talented individuals or groups of researchers. Innovation is also largely seen as a linear process from basic research to market applications. In fact, there is no feedback from the last stages of the innovation process (e.g product development, production, and marketing) to the early stages of research; also there is no feedback between stages.

This linear model was later found many shortcomings, therefore, appeared models that looked at the problem systemically. The next innovation theories emphasize that innovation usually takes place on social cooperation and normal economic activity. The focus has shifted to the non-linear innovation process that is interactive and in multi-actor innovation

networks (Schienstock & Hamalainen, 2001). The systems approach to innovation is also emphasis on prudence and the detail of the development of public policy for innovation (Edquist & Hommen, 1999).

The subsequent development of the innovation models is an emerging awareness of the importance of innovation in economic development of the region. Governments and institutions in the region are trying to encourage innovation so that innovation policy is put in the center of the policy of promoting regional and national economic development. At the regional level, regional innovation systems have been seen as a policy framework or model for the implementation of long-term development strategy, begin with the process of innovation based on learning, change, and improvement (Asheim, 2007). Moulaert & Sekia (2002) uses the concept of territorial innovation models as a generic name for a model of regional innovation which local institutional dynamics play an important role. Approach to regional development should be based on a multi-dimensional view of innovation, economic and government dynamic. Development of the region doesn't only mean enabling increased economic local and regional markets, but also empower other parts of the economy (eg public sector, socioeconomic, cultural sector, low productivity craftsmen) as well as the life of the community (e.g. The dynamics of

sociocultural, political order and social, as well as the natural life) (Moulaert & Sekia, 2002).

Triple Helix is a model of the regional innovations introduced by Etzkowitz & Leydesdorff (1995) and has been widely known in developed countries (Shinn, 1997; Leydersdorff & Van den Basselaar, 1997). Until now the model has also been deployed in developing countries. This model uses a positive synergy between government, industries, and universities (academics). The model describes the role of the three actors in the innovation development of an area, where the university as a center of research-based development activities, the industry as a provider of commercial activities based on the consumer needs and the government as the policy maker.

The model of the relationship between industry, government, and academia originally consisted of three types based on the type of relationship between the three related institutions namely (Etzkowitz, 2003):

1. The static model where government control of industry and academia.
2. The laissez-faire model where industry, academia, and government apart from each other, interacting only when necessary course.
3. The triple Helix model, in which each institution will maintain a relationship

with one another. Three forms of the model can be seen in Figure 1.

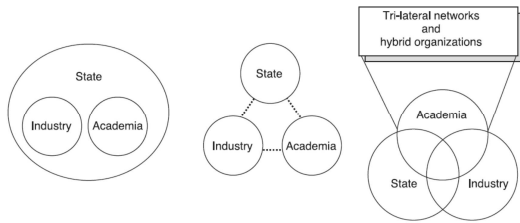


Figure 1. Three forms of Triple Helix Model (Etzkowitz, 2003)

In the static model, the government dominates the other two parties, so that the development of innovation system, institution, and partnerships controlled by the government. In the model *laissez faire*, three infrastructures separated by a clear line and very limited inter-institutional relations. Triple Helix Model describes the pattern of complex and dynamic relationships in the three institutions. The relationship of these three institutions forms a spiral of mutual overlapping knowledge infrastructure.

Triple Helix Model is basically a model to analyze innovation in a knowledge-based economic system, and is dynamic in accordance with the dynamics of change and the context. Taufik (2010) stated that the development perspective of shapes and relationships between the various actors in the system of innovation does not just happen, but is formed or developed in the evolution of social, technical and economic impacts of modern society that tends to transform themselves

and interact between them. Rearrangement configuration would then form a partnership topology as a function of communication and coordination between the relevant institutions.

Yawson (2009) states that the system of triple helix, state, university and industry missed an important fourth helix, namely the public. Therefore, in its development appears quadruple helix innovation model. Quadruple helix concept is the development of a triple helix with a fourth party which varies, for example education and entrepreneurial development manager (Rebernik, 2009); civil society (Carayannis & Campbell, 2012), the group of innovation actors (Fuzi, 2013).

The quadruple helix model has not been widely applied in studies of innovation and innovation policy (Arnkil *et al.* 2010). However, the innovation literature found many concepts that lead to a quadruple helix. Some quadruple helix concept close to the concept of the triple helix, some have vastly different concepts (Arnkil *et al.*, 2010). The same thing on these concepts is the addition of a fourth helix as an actor triple helix innovation model.

Delman & Madsen (2007) stated that the organization of the fourth helix leading to a quadruple helix structure is an independent, nonprofit and member-based. The fourth helix organization acts as a facilitator between the three other helixes.

They are usually independent, nonprofit organization and leveraging private and public investment to jointly fund research and development programs, and provide technical service products and services.

The regional innovation model can also be applied at the level of industrial agglomeration of small industries (small industrial cluster) as an effort to develop it. Small industrial cluster in Indonesia, almost all of which are craft-based clusters like the shoe industry, webbing, handicrafts, furniture, metal. In an effort to support the government policy to develop small industrial clusters, the core business of the cluster can serve as the leader of the trajectory of cluster development (Widjajani, 2008). This driver acts as a locomotive that will pull its carriages, which are the other industries in the cluster, towards progress. This concept of industrial cluster development can also be applied in the villages. The village small industry that's based on the village potential can serve as the driver of village development. The village small industries can be industrial products, services or a combination of both as the tourism industry.

## RESULT AND DISCUSSION

The final aim of this research is to develop a model for the village development in West Java province to improve the welfare of its rural communities. In order to conduct this

research, the first thing is to identify one of the villages potentials that can be used as a driver for the village development, examines the process of village development, describe the roles of the institutions involved and their synergies, and develop a model of the village process development.

### **Identify the driver of village development**

The potential of the village is handicraft industry and the tourism industry. The tourism industry is chosen as the driver of the village development. So that the driver is able to move forward, it needs to be managed professionally. Therefore, the village government should establish village-owned company engaged in rural tourism industry management services. If the driver is likened to the locomotive, then other village industries will be the carriages which together will go towards the development of the village.

The observed result from six villages came with findings that the process of village development is a holistic process and cannot be done just by a single institution. Therefore the village development model should be a holistic model that involves institutions that share decision process made in the village. Otherwise, each institution in the village has their own roles and also have their share roles. Therefore, each institution in the village should confirm about their roles

and use their each other synergies to be used as a power to solve villages' holistic problems.

The running of the driver that brought the village towards progress is using the Quadruple Helix model of innovation, which is exploiting synergies between the government system of the village, the village industrial systems, industrial systems rural communities and rural education system. Quadruple Helix Model describes the process that must be carried out in implementing this model to the Village, that are the purposeful activities of the synergies between these systems. This model is a model with emphasis on cooperation between systems so as to provide more energy to the progress. The purposeful activities have a common goal of promoting the locomotive, so that if the locomotive has advanced, then the next carriage-carriage will also be developed. The quadruple helix model can be seen in Figure 2.

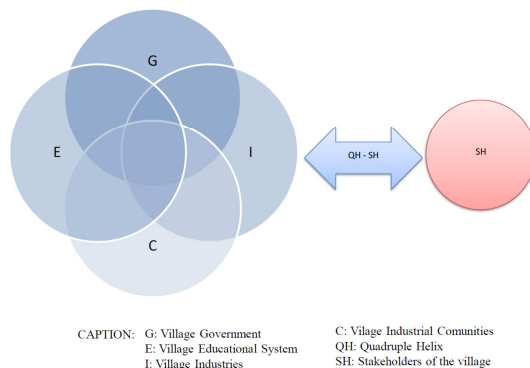


Figure 2. The Quadruple Helix Model for Rural Development

The operationalization of the quadruple helix in developing educational tourism industry is by forming village tourism industry management organizations, in the form of village-owned enterprise (Badan Usaha Milik Desa - BUM Desa). The company will manage the Village Tourism in a professional manner. The village tourism management enterprise will be assisted by the communities of village industry that will provide sources of tourism services, e.g. community of homestay provider (providing homestay services), community of craft industry (providing educational training services on making crafts), community of culinary industry (providing services on serving the typical culinary of the region), and communities of other industries supporting tourism. Tourism Village will attract tourists to come and in addition, it also introduced the industry's existing products so as to provide ample opportunities for the development of industrial product marketing of the village. The village tourism management enterprise and representatives from each community Industry Village then work together in a working group known as Pokdarwis (Tourism Awareness Group) or Kompepar (Tourism Activator). This group is set jointly agreements to work together in developing the village with win-win solution principle.

In the process of internal synergies, any member of the quadruple helix system has the following roles:

1. The Government of the Village:
  - a. As a regulator, facilitator, catalyst
  - b. Founder of village tourism management enterprise so the village government also serves as supervisor and controller.
2. The Rural Industries serves as rural producers in the form:
  - a. Small industrial products for example woven, culinary, other products
  - b. Services industry for tourism, e.g. training, homestay, guide, culture, outbound.
3. Communities of Rural Industries has the role includes:
  - a. Coordination role with similar rural industry
  - b. Acts as a liaison between the rural industries and the village tourism management enterprise
  - c. Acts as representatives of rural industries in the working group (Pokdarwis/Kompepar)
4. Village Education System with their young generation has a role, among other things:
  - a. Maintain rural industry sustainability by implementing the local content of the rural industry knowledge on the school curriculum

- b. Source of Rural Creativity and Innovation, done, e.g. by a contest or festival among others to bring creativity and innovation

In addition to the synergies between internal systems which form the quadruple helix, these models also utilize synergies between the quadruple helix with rural stakeholders such as universities, higher government system, suppliers, marketers, corporate travel services, transportation companies, and so on. Synergies with stakeholders conducted mutually beneficial cooperation so as to establish long-term cooperation.

## CONCLUSION

The village is the smallest region of the country which has autonomy in its management. If the village can be developed to be prosperous and independent, it will enhance the welfare of Indonesian society as a whole. Rural development in order to advance independently and sustainably should be based on the potential of the village. For the villages in the West Java province with potential for rural tourism and handicrafts, village tourism industry has been chosen as a driver of rural development. Then quadruple helix innovation model is used as means to develop the driver in order to go ahead and pull the other village industries and ultimately can create prosperity of rural communities.



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