



Community Empowerment in Magelang City through the Interaction of Innovation

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Abstract. The regional innovation system in Magelang City, Central Java, Indonesia, has successfully promoted community empowerment through tourism. Through the creation of Katagie, an artificial tourist destination aligned with the Regional Innovation System Roadmap, the system has utilized existing resources such as the Tofu Center, Tofu Waste Processing Installation, and Integrated Waste Treatment Site to transform Tidar Campur into a thriving tourist hub. Community-based tourism initiatives, including the development of Kampung Warna Warni, Taman Anggrek, and the adoption of Village Tourism Technology and Education, have further empowered the local community and improved their livelihoods. By generating additional income opportunities, the regional innovation system has demonstrated its potential for sustainable and inclusive economic development in the region. Overall, the study highlights the crucial role of the regional innovation system in fostering community empowerment and time-based regional superior product interventions in Magelang City.

Keywords: Innovation Interaction, Community Empowerment, Creativity And Innovation

1 Introduction

A regional innovation system (RIS) is a development process with the integration of related stakeholders into one of the leading areas in one region through an innovative approach. Several regions in Indonesia adopted RIS referring to a perspective that adapts to the character of affairs and regionalism, such as [1] in the City of Semarang by identifying the readiness of policy instruments to encourage the development of RIS and proposing recommendations for policy strategies in the development of RIS, meanwhile in the Central Government [2] explained that the RIS program is an empowerment program, both for the community and even empowerment for all elements such as academia, the private sector, government, and society. In the article [3] Batu City is

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one of the regions which is a division, a systemic study was carried out on Batu City after it was established as an administrative area of the city regarding the performance of regional competitiveness. Strengthening RIS by looking at the condition of the maturity level of the livestock innovation system in the Lima Puluh Kota Regency has been studied by [4]. Then [5] measures and describes the conditions of policy implementation, the conditions for the development of institutional development achievements, RIS networks, and resources. The regional approach in some of these studies explains that RIS works by adjusting the character of the region, both in terms of natural resources and human resources.

The city of Magelang, with the regional character of being included in a small town because it only has an area of 18.54 km² and the limited availability of natural resources, demands an increase in capability and capacity through strengthening RIS [6]–[11]. The RIS of Magelang City was set with the theme of a technology-based and environment-based tourism industry starting from 2016 to 2021, with a series of targets divided each year, although over time there have been changes in targets due to the dynamics of development and changes in the character of the region and society. In its development, one of the locations designated as the RIS Area is the Tidar Campur Area. This area is considered capable of contributing to regional management based on community empowerment [12]–[17].

In [1] it is stated that the innovation system is a network of institutions in the public and private sectors whose interactions initiate and diffuse new technologies [12], [14], [18]–[22], while [2] summarizes the definition of RIS by stating that the Innovation System is a system that brings together different institutions that contribute jointly/individually to the development and diffusion of technology and provide a framework, within which the central/local government forms and implements policies to influence the innovation process. Then [3] describes that the innovation system is essentially a system or a unit of various elements or elements (actors, institutions, linkages, networks, interaction processes [23], and policies) that affect the direction of development and speed of innovation, the diffusion of innovation and the process learning that occurs in a country or region. This system covers the fields of science, technology, and innovation. This innovation system must be continuously built or dynamically strengthened. The RIS concept in Magelang City has similarities with some of these references, at least it includes a system of interactions [23], elements, and technology/innovation applied in one area that has been standardized and limited to a certain period (five years).

The community's ability to respond to programs and activities launched by the government generally takes different forms, by adjusting the regional character and available human resources in the area. Human resources [8] are generally characterized by age, education level, gender, livelihood, and other supporting factors. But overall the community response is a form of community empowerment. In several articles, for example, [24] which makes community empowerment in local wisdom and innovation, [25] which relates to family empowerment posts, [26] which takes pictures of coastal communities, [27] through a development innovation approach, [28] with efforts to overcome disturbances due to iodine deficiency, [29]–[31] which discusses community empowerment strategy, then a village innovation approach [32], [33] which conducts

community empowerment studies with a tourist village locus, [34] examines community empowerment institutions, the field of entrepreneurship [35] as a form of empowerment as in [36], furthermore community empowerment has a definition which provides boundaries in the form of efforts made by a group of citizens using certain methods against p dynamics in an area leads to continuous changes for the better. Considering that RIS has an important role in integrating stakeholders related to time-based regional superior product interventions. RIS in Magelang City already has a roadmap for the 2016-2021 period, during which period community empowerment emerged which is in line with RIS. Therefore, this study aims to explore and analyze RIS in Magelang City in terms of institutional capacity and empowerment carried out by the community at the RIS location.

2 Method

The research method uses exploratory and participatory descriptions. Participatory refer to [37] that highly rigorous, but reflective or interpretive, empirical research approach, the active involvement of individuals who are traditionally known as subjects as participants and contributors in research focus, integration of some practical results related to the real life of the respondents in this study which is presented qualitatively. The secondary data source is from the Research and Development Agency of Magelang City which has the capacity as the RIS secretariat of Magelang City. The RIS location in this study was limited to Tidar Campur Village, South Tidar Village, South Magelang District, Magelang City, Central Java Province, Indonesia. Primary data comes from the community in Tidar Campur village, North Tidar Village, South Magelang District, Magelang City. Community-based tourism is a tool used in analyzing studies.

3 Result and Discussion

The community empowerment [23], [38] carried out concerning RIS in Magelang City is to form a technology-based tourism area that educates the internal community and visitors with an integrated system, with the acronym Katagie. Originally, Kampung Tidar Campur in Tidar Selatan sub-district, South Magelang District, earned the nickname 'Colourful Village' because in every corner of the residents' houses, in the streets of the village, the walls of the buildings were painted in colours, 'like a rainbow', according to travellers. Who has stopped there? The murals beautifully painted on the walls of the houses will surely amaze the visitors who come. These range from simple to three dimensional, and make interesting places to be photographed. At the beginning of 2016, the idea of a colourful village was born. In 2016, the city government of Magelang declared the village of Tidarkampur as a RIS area with the theme of "Industrializing Tourism based on technology and eco-friendly", as standardized in the city's mayoral ordinance No. 070/105/112 of 2015. After coordination and synchronisation, it was agreed to focus on four aspects which were identified as key drivers for the implementation of the RIS theme: a) geographical, b) infrastructural, c) demographic, and

d) socio-economic. In addition, several activities to be carried out over a five-year period from 2016 to 2021 are outlined for the implementation of the RIS theme.

3.1 Innovation in institutions and society

Meanwhile, organizational [10], [39] management in Indonesia, including the City of Magelang, has influenced the structure of implementing RIS strengthening, both from an institutional standpoint and in strengthening the capacity and capabilities of R&D human resources [8], [12], [13], [19]. It is these two things that then need to be worked on to better understand the process of strengthening RIS and adjusting the RIS Roadmap that has been prepared previously. The organizational arrangement within the Magelang City Government regarding research and development matters is standardized in the Magelang Mayor Regulation Number 48 of 2016 concerning the position, organizational structure, duties and functions, and work procedures of the Magelang City Research and Development Agency. In this regulation, the Research and Development Agency has the task of assisting the Mayor in carrying out research and development support functions which are the authority of the Region.

The RIS programme has involved organizing the Tidar Campur area to become the Tofu Centre. and universities to support the success of RISs. Furthermore, the community of Tidar Campur has been socialized with information about the RIS program and guidance from the local government on RIS. Community empowerment in line with the RIS roadmap for Magelang City can be generated. It also corresponds to several previous contributions on the empowerment of communities through government intervention.

The formation of Kampung Warna Warni became a community empowerment that started in 2017: Tidar Selatan residents painted their private houses with attractive color combinations. His work inspired other residents to do the same, and seventeen houses joined. Currently, twenty-five houses are painted in vibrant colors. Painting the houses is not the only part of the colorful village concept. The local access road was also painted, murals were made and most uniquely, traditional games were provided for children. Getting to Kampung Warna Warni is very easy as it is located in the city and there are also directions to get there. In addition, there is an ample parking area that can be used to park large types of vehicles such as large buses and coaches. The local government responded by providing several prototypes of community innovation results that could be used as educational tools for visitors. The name Katagie, which stands for Technology and Education Tourism Village, was created at this stage. Katagie already has a number of facilities that can be used by the public and visitors, such as a tofu centre, a water tower, an integrated waste management site [40] and an orchid garden.

The tofu center area is the core area which is the initial attraction for the development of the tourism industry in the context of products, processes, and locations. The product context is based on the production results in the form of tofu with the expected handling according to government regulations. The problem that occurs is that the number of tofu craftsmen in the tofu center area has decreased both in terms of quantity and quality. Tofu craftsmen until 2019 totaled Twentynine craftsmen from thirteen heads of families in the Tidar Campur Tofu Center Area. In production, the main problem is the selling price which is still below the cost of production.

Water Tower is located near the Integrated Waste Management Site which is a water facility for tofu craftsmen at the Tidar Campur tofu center area. This building is one of the additions to the innovations carried out in the Tidar Campur tofu center area.

Temporary landfill Bojong which is often called the Bojong Integrated Waste Management Site [41], [42] is a main residential waste processing site. Three activities are carried out at this location, namely, waste sorting using a belt conveyor. Then the processing of organic waste is composted. Furthermore, specifically for plastic waste, recycling will be carried out in the future. A leachate pond was also built at that location to collect the water that comes out of the garbage. The facilities available are in the form of cells with a depth of about seven meters for each cell and a tolerance for waste heights of up to three meters. Every day the final landfill accommodates 350 m³ of waste or forty trucks. The rest of the land is used for leachate ponds, places for making and storing compost, gardens, and so on.

The thematic villages in Magelang City continue to grow. Most recently, the Orchid Garden of the Pillars of Fortune is in Tidar Campur, South Tidar Village, South Magelang District. The existence of this orchid garden adds to the liveliness of the village which is at the southern tip of Magelang City and borders Mertoyudan District, Magelang Regency. Previously there was Kampung Warna Warni which displayed mural art designs on the walls of residents' houses. The cultural tourism, because in that village they still maintain local wisdom [43] such as Grebeg Tahu, sadranan, and so on. Orchid garden began in 2014. Initially, this program was competency-based training from the National Community Empowerment Program which received assistance and could be developed. Apart from the orchid garden, this place is also facilitated with a wifi network, a gazebo, reptile animals, and selfie spots. Amid this pandemic, it is hoped that this location can become a learning place for students who need an internet [44], [45] network.

Katagie intends to create a tourist destination based on the RIS by involving the active participation of the local community and empowering local potential in a sustainable and integrated manner. The goal is to create a new community-based tourist destination in Magelang City; provide technology education for the public and visitors to the tofu center area, and empower the potential of the community in increasing income both directly and indirectly in the City of Magelang. The community's response to Katagie's existence has also shown positive results, which are shown quantitatively in Table 1, a visit to Katagie.

Community empowerment that has developed during RIS up to the formation of Katagie will at least get benefits; Katagie provides benefits to the community from the tourism sector in the form of tourist visits who are interested in the uniqueness of Katagie in Magelang City; Katagie provides learning about existing technology in society interestingly in Magelang City; Katagie documented the prototype of community creativity and innovation in the form of an indoor gallery which can be used as a reference for the community in carrying out innovation activities in the City of Magelang. In a scientific approach, Katagie has a model that has been developed in several areas, for example, Bedono Village, Sayung District, Demak Regency [46]; then Tourism Village, Batu City, East Java [47]; [48] Kulon Progo Regency, Special Region of Yogyakarta; [49] Nglanggeran Tourism Village, Patuk, Gunungkidul; meanwhile, Kawaliwu Beach, Sinar Hading Village, East Flores by [50].

Table 1. Data on the number of Katagie Visitors in 2020

No	Month	Visitor	
		Domestic	foreigner tourist
1	January	-	6 person
2	February	26 person	2 person
3	March	27 person	2 person
4	April	- person	- person
5	May	- person	- person
6	June	18 person	- person
7	July	3 person	- person
8	August	0 person	- person
9	September	0 person	- person
10	October	75 person	- person
11	November	15 person	- person
12	December	16 person	- person

Source: Kampung Warna Warni Tidar Campur, 2021 processed

3.2 Community Empowerment Interaction

In the Feasibility Study of the Tofu Tidar Campur Industrial Area as a Technology-Based and Environmentally Friendly Tourism Area – Research and Development Agency of Magelang City in 2017, seven recommendations must be made in support of the RIS Roadmap, including:

1. Attractiveness. The first recommendation is desirability, which is divided into three items. The action plan for attractiveness involves the relocation and acquisition of land for 10 houses on the banks of the river, a colourful village with painted buildings, the creation of tour packages on the process of tofumaking, the socialization of tofumaking in terms of clean, beautiful, orderly tofu making, and the construction of a community sewage system on the banks of the Elo; Repairing the Elo River gorge, constructing the Elo River inspection road, constructing paths, providing rafting equipment, providing tools, constructing paths, constructing the Tarzan crossing arena, constructing a double line bridge area, constructing a repellent arena, constructing a cargo net arena, constructing a suspension bridge arena, and planting trees on the river banks.
2. Unique characteristics. In terms of unique features, there are five recommendations. They are: improving the quality of environmental roads by providing drainage; constructing new environmental roads and drainage; improving the quality of roads, sidewalks, and drainage to the tofu home industry area; constructing parking areas; constructing the Gandekan River Land Retainer; constructing the Gandekan River Inspection Road; procuring medium-size pots; procuring small pots; procuring fruit and vegetable plants in medium-size pots; procuring fruit and vegetable plants in small pots; and procuring fruit and vegetable plants in small pots; Planting fruit and vegetable plants in medium pots; Procuring small pots; Planting fruit and vegetable plants in small pots; Providing shelves for fruit and vegetable plants in small pots; Providing planting boxes; Providing garden lights; Providing meeting places; Building tofu tourism entrance gates; and Developing tofu tourism landmarks.

3. **Supporting Infrastructure.** The recommendations submitted in the area of supporting infrastructure consist of 6 things that will be collaborated with the relevant regional apparatus. The same thing happened with the recommendations for attraction and main features that were submitted previously. Improvement of the quality of environmental roads by providing drainage, construction of new environmental roads and their drainage, improvement of the quality of roads, pavements, and drainage in the Tofu Home Industry Area, construction of parking lots, construction of the Gandakan River Land Retainer, construction of the Gandakan River Inspection Road; Procure medium pots; Plant fruit and vegetable plants for medium pots; Procure small pots; Plant fruit and vegetable plants for small pots; Provide shelves for fruit and vegetable plants in small pots; Install flower boxes; Install garden lamps; Create meeting areas; Build tofu-tourism entrance gates; and Build tofu-tourism landmark.
4. **Market Potential,** There are two recommendations on the market potential to encourage this area to develop from a commercialization aspect. The action plans being pursued are making a showroom for home industry products; the Provision of promotional media and organizing production exhibitions.
5. **Management of Visitors.** The results of the recommendations on this aspect are two follow-up plans that need to be carried out by regional officials, namely vehicle parking arrangements and travel route arrangements.
6. **Clean Water** is one of the most important recommendations in maintaining the continuity of the tofu production process and for the secondary primary needs of residents in the area. The action plan to be carried out is the construction of a land retainer and the construction of a road to the spring.
7. **Visitor Arrangements.** In anticipating this area to become a tourist destination, it is necessary to prepare a mechanism for managing visitors, so that this aspect becomes one of the recommendations that need to be submitted. The follow-up plans include setting visitor schedules and setting tourist attractions and tourist tools.

This model is referred to as Community Based Tourism (CBT). In [51] explains there are at least nine stages in encouraging the growth of areas that focus on tourism by involving community empowerment. CBT analysis (Figure 1) in this study can then be carried out by adjusting the stages in CBT, as follows 1) Katagie has an initial process by conducting various forms of Community Needs and Readiness Assessments for Tourism, Technology, and education by utilizing the Tidar Tofu Mix Center Area; 2) Katagie identifies and determines local excellence in the form of regions, traditional culinary, and foods that are unique from the past; 3) Katagie conducts education and prepares communities for tourism, technology, environment, and society; 4) Katagie prepares and develops community organizations in the tofu Tidar Campur Center Area into an integrated area with support from the City Government of Magelang; 5) Katagie develops partnerships [52] with internal potentials in the Tidar tofu Mix Center Area; 6) Katagie adopts an integrated approach [53] based on the RIS from the Magelang City Research and Development Agency; 7) Katagie plans and designs quality products that can be used as the mainstay of the Tidar Campur Area as a tourism and technology destination with education for visitors and the community; 8) Katagie developed a Marketing Strategy by utilizing information technology and technology in the form of prototypes resulting from community creativity and innovation through support from the

Magelang City Research and Development Agency; 9) Katagie identifies market demand so that from time to time it has facilities and destinations that are dynamic and increase every time by adjusting the capabilities and capacities of its residents.

4 Conclusion

This study shows two findings, first community empowerment by forming Katagie as an artificial tourist destination can complement and adapt the RIS Roadmap. RIS was able to turn the Tidar Campur Area into an artificial tourist destination by raising existing potential, such as a Tofu Center, Tofu Waste Processing Installation, and Integrated Waste Treatment Site. RIS was able to encourage the emergence of community empowerment in the field of tourism in Kampung Tidar Campur which is useful in increasing income, such as Kampung Warna Warni, Taman Anggrek, and the process towards Village Tourism Technology and Education. Community empowerment grows and develops with community empowerment in the tourism sector.

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