Exploration of creative industry networks: the case of Binongjati knitting community

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Abstract. The creative economy is a term used to describe industrial activities that are traditional and innovative. Each creative economic activity in Indonesia has its own uniqueness, and in these activities skills, knowledge, and creativity are transferred through local and national links. The paper argues that the characteristics of similar artists are very different between the two types of industries. This paper aims to examine the business networks developed in the context of creative and informal economy in the production and sale of goods of creative kampongs in Bandung. The case study is the Binongjati, a historical creative kampong that specializes in the production of knitting crafts and related fashion products. This study was conducted by interviewing the key persons in Binongjati and distributing questionnaires to business owners. The study found that business networks in the Binongjati creative kampong are spatially wide and economically established. However, based on the production process, industries significantly relied on their production input to local suppliers. Thus, the industry is fragile to any disruption to the local economy in Bandung. However, there are at least two policy implications that need to be considered: the importance to capture local knowledge and innovation and the creative industry policy that should focus to expand the market by enhancing business network analysis and business database of both supplier and customer.

1. Introduction

Presently, creative industries and strategies of creative cities have been from and focused on the context of the Northern Global, especially related to the characteristics of industry and (formal) sectors. Little attention has been paid to the development of creative industries in the context of the Global South [1, 2] that reviews the relationship between creative industries and the informal economy, or on how informality and the informal economy must be recognized by planners and policymakers to support local economic growth in future.

In Indonesia, the creative economy is a generic label given to traditional and innovative industries that both accelerate the local economy. However, both economies are unique as skills, knowledge, and creativity are transferred through local and national linkages. In this sense, the determinant of the creative economy is beyond the classical economy. Rather, it relates to institutional, knowledge, and innovation of ideas within and beyond spatial boundaries. The paper by Fahmi et al [3] shows that the generalized term “creative economy” could not be copied to Indonesia as there is a clear distinction between cultural and creative economy, as suggested by Pratt [4] and Aritenang [5]. The paper argues that in terms of educational background and spatial proximity to similar artists, both types of industries...
are very different. As such, it is important to analyze the economic impact of each industry on regional development while considering spatial distribution.

In this paper, we examined the business networks that develop in the context of creative and informal economy in the production and sale of goods in creative kampongs in Bandung. The case study is Binongjati, a historical creative kampong that specializes in the production of knitting crafts and related fashion products. The kampong was chosen as a case study as it offers a complex and multi-stakeholder network that spatially expands from within the kampong to international networks in terms of trade.

Previous studies have highlighted the challenges in integrating creative economic strategies and policies with the existing (informal) economy and local communities [1, 2, 6] and re-branding the location of creative villages [3]. Other studies have also explored the kampong’s physical impact [7] and economic development as a tourism destination [8]. In Bandung city, informal enterprises have also flourished in the last three decades and developed as a stable and growing industry. Therefore, its existence can affect the urban economy more broadly. As such, this suggests that informal enterprises are strongly related to formal enterprises through produces for, trades with, distribute for, or provides services to the formal sector [9].

However, to date, there has not been a specific study examining the network in informal enterprises. Specifically, this study explores the production and market networks in Binongjati and identifies the policy implication for maintaining a business network in Binongjati. Thus, this study contributed to the creative economy literature by (i) examining network business in informal economies and (ii) exploring business network policies in the creative industry in the Global South context.

The paper is structured as follows: section two discusses the literature used in this study, section three elaborates research methodologies, and section four presents the analysis of the study. Finally, section five provides study discussions and a conclusion.

2. Literature context
As globalization progresses, the economic growth engine shifts from manufacturing to knowledge and a creative-based economy. The Cultural and Creative Industries (CCI) emerges as a new branch of the economic development model and has widely investigated the relationship and importance of cultural economy and human creativity. Studies of CCI emphasizes endogenous development that recognized the local endowments and institutions. The literature of policy transfers literature emerges from the political and urban studies that emphasize the exchange of information and networks among actors.

The CCI is conceptually related to the endogenous growth model that emphasizes the role of regional policy by promoting localities that acknowledges differences in local endowments and development policies. The model’s idea of increasing returns implies two characteristics of regional development, agglomeration, and geographical spillovers. First, agglomeration is a result of knowledge accumulation and distance proximity implying that as economic agents see the incentives to produce new ideas and knowledge for profit, technological progress is internalized in the production function, thus leading to economic activities. Second, geographical spillovers occur as knowledge is increasing marginal productivity that explains local education, and the transfer of knowledge is embedded and accumulates within each region.

Another important idea that shapes this paper is the informal economy. Here we define informal economies as the production of goods or services that are not registered nor recognized as tax objects, but whose general production and sales activities remain legal. The literature further refers to the informal economy and focuses on the production of goods and services in areas outside of trade and service zones as well as outside the policies of taxation, health, safety, minimum wages, and other types of standards [10].
2.1. Binongjati Sentra
The Binongjati knitting industry center has been operating since the 1970s and was founded by several local workers who worked under the sub-contract system with Chinese entrepreneurs. Following the increasing demand for knitted products, the Chinese entrepreneurs asked them to work on knitting orders at home [11]. In the process, while working on their own orders, these first-generation knit workers also teach their families, friends, and neighbors to produce knitwear. This industry continued to develop using knitting machines and over time, the Binongjati knitting industry had a rapid increase in the 1990s to the 2000s. However, during the period from 2005 to 2008, the industry had a sharp decline in terms of income, production output, and the number of workers. From 2009 to 2011 there was an increase in the number of craftsmen, but again, from 2012 to 2016 there was a sharp decline which only left 34% of the craftsmen that shows as follows.

| Year | Total of Craftsmen |
|------|--------------------|
| 2009 | 350                |
| 2010 | 380                |
| 2011 | 400                |
| 2012 | 350                |
| 2013 | 300                |
| 2014 | 270                |
| 2015 | 200                |
| 2016 | 120                |
| 2017 | 200                |

Starting from 2017, the Binongjati knitting industry has slowly begun to grow and develop again as craftsmen began to adjust their production to what the market wants. The increase in the Binongkati knitting industry is also supported by the craftsmen themselves. Most of the knitting business actors in Binongjati now are the 3rd generation.

Presently, the Binongjati knitting industry has diversified its products with various types of clothing, cardigans, sweaters, jackets, and bags, with an annual production capacity of 984,426 dozen and investment value of 31.4 billion. The number of production houses is 293 business units with 2,200 workers [12]. Furthermore, the knitting production in Binongjati depends significantly on the machinery. The paper by Darusman and Rostiana [11] shows that an increase in machinery would lead to higher production and sales volume. In the long run, this would induce more employment demand in the Binongjati knitting industry.

According to Rosandi [13], business actors in Binongjati follow a specific scheme of the marketing process (Figure 1). First, the knitted business owner makes a sample of products. Then, they offer these design samples to several customers or the market. If the customer and the market respond and are attracted by the design, the knitted business owner will produce the product in large quantities. Second, knitted business owner distributes their products through collectors, then collectors sell products to consumers. Third, knitting businesses market their products through cooperatives, which then distribute the products to consumers. Fourth, customers come directly to the knitted business owner to buy knitted products. Usually, they also carry special designs to request the knitted business owner to make. The profit gained from this marketing system is greater than that of other marketing systems.
2.2. Network analysis

Social networks are a set of relationships that consist of a collection of entities or individuals by looking at relationships between individuals in them [14] or as individuals who are connected to each other through an information flow pattern [15]. Additionally, the level of importance of the relationship between individuals who interact also needs to be considered so that the relationship between individuals is a fundamental component of network theory is the basic assumption of forming social network analysis.

More specifically, in the analysis of social networks, graph theory is the basis of operations where a Graph is a model for social networks with dichotomous relations that are not directed (undirected), namely by seeing the presence or absence of bonds between actors. In graph theory, the nodes represent the actors involved and lines represent the relationships between actors. Graph theory is used in the analysis of social networks for several reasons which can show social structure, can quantify qualitative data through measurable mathematical ideas, and provide the ability to prove theorems about graphs that represent social structure.

For further analysis of social networks, a measurement of centrality is used in quantifying the interests and influences of actors as individuals in a network [14]. This approach consists of degree centrality, closeness centrality, betweenness centrality, and eigenvector centrality with the following explanation.

First, the degree of centrality is used to find out the number of contacts the actor has in a network, or in other words, the degree of centrality can be used to see the level of involvement of actors in activities in the network. In the communication relationship between factors, if an actor has the highest degree of centrality, then that actor is the main actor in conveying information on the network. In this degree of centrality can also be seen regarding indegree centrality and outdegree centrality. Indegree centrality is the number of bonds received by an actor from other actors, while outdegree centrality is the number of bonds given by an actor to other actors. In general, indegree centrality and outdegree centrality will have the same value because actors who have the highest indegree centrality are called prominent parties and those who have the highest outdegree centrality are called influential parties.

Second, closeness centrality is a measurement to see the independence of an actor in the network and the ability of actors to access information, through power and influence [14]. If an actor has the highest proximity value, then that actor can easily mobilize a network because it can easily reach other actors.

Next, betweenness centrality shows how often an actor is between two other actors, i.e. counts the number of times the actor is at the shortest distance connecting two actors. Measuring the degree of interdependence also requires that the actor be an intermediary if the actor is the central/main actor.
Furthermore, betweenness centrality can see how much an actor has potential control because it can influence the network by choosing to hold and forward existing information or distort information that has been received by the actor. Finally, Eigenvector centrality allows us to see a network of local actors directly adjacent to the main actors [14]. So, if there is an actor in the network who has the highest degree of centrality, the higher the eigenvector value of the main actor.

2.3. The project

The paper by Aritenang et al [16] argues that villages in Bandung City have special characteristics of the informal economy including household-based industries, creative industries (crafts, culture, and arts), and tourism industries. At the same time, these kampongs also have a considerable economic potential that plays an important role as the center of the informal economy in the respective kampongs. Thus, kampongs can be regarded as a part of an urban development strategy that aims to take advantage of the development of creative industries and provide opportunities for local economic growth and the commodification of existing economic activities. As such, research at the village scale could contribute to enhancing our understanding of how the village can influence the spatial patterns of urban development, the urban formal economy, and its relationship to formal authorities and governance structures within the city. Thus, we could find the development strategies of these kampongs in the Bandung City Government's initiative to support the development of creative industries by formulating formal urban policies and strategies for the Mid-term Regional Development Plans (RPJMD) of the City of Bandung 2014-2019 and 2019-2024.

This paper uses business network data collected as part of the INECIS project, a research consortium that studies several creative kampongs across Bandung with members including ITC – University Twente, ITB, and INISIATIF. The creative kampongs included in the research are kampongs Dago Pojok, Binongjati, and Cigadung. The INECIS project aims to understand and provide knowledge on the development of the creative sector in kampongs in Bandung, Indonesia. The project has three working packages which are examining creative city policies and its implications on informal economies and creative kampongs in Bandung, analyzing networks, and proposing theories of changes to improve the socio-economy of the business in these creative kampongs.

3. Data and methodology

The main source of data used in this paper comes from the INECIS project using a questionnaire survey. The survey questions are designed to gather both a broad overview of the creative sector and also examining informal local businesses in Binongjati. The survey was conducted by phone or tablet with the app to automatically obtain the geo-location of the business location. There is a total of 133 surveys are collected in Binongjati.

In this study, we develop a network analysis (conducted and visualized using the Gephi software) by looking at the location of suppliers and customers data, which are classified into 5 categories; within kampong, elsewhere in the city, outside the city, multiple cities, and other locations. The results are discussed with qualitative aspects and quantitative aspects of the kampong that include stakeholder identification, type of relation, subsector the business produce products within, spatial proximity, degree, and several relations to connect with other stakeholders. For research triangulation, we also conduct and analyze a semi-structured interview with the Binongjati firm association (KIRBI) representative. Also, the interview provided further information on the enterprise’s reasons for choosing suppliers or market expansions.

4. Binongjati production and market network

First, we identify the stakeholders in the Binongjati business network in addition to the 133 firms in our sample. The graph bellows depicts the supplier companies that provide input for Binongjati firms (Figure 2). The largest supplier company is the CV Pribumi that supplies more than half of the firms surveyed, 83 firms out of 133 firms. The following largest supplier company is Kurnia Baru and Kurnia Abadi that each supply 6 and 7 firms respectively. These supplier companies are located within the
Binongjati kampong so there is relatively no transportation cost for firms to obtain supplies from these companies for their production input. This was confirmed with the following quote from the Binongjati firm association representative

“We use yarn as main raw material from Kahatex that distribute through distributor which located in this kampong”

![Figure 2](image.png)

**Figure 2. Supplier Companies for Binongjati Firms**

According to the interview result, the supplier companies provide yarn as the main raw material and supplementary raw materials such as buttons and zippers. As we see in the graph (Figure 2), Kahatex and Indorama are a factory that produces yarn as raw material and the other companies are distributors.

An interview with the Binongjati representative reveals that there are several considerations for craftsmen in choosing suppliers, i.e. price, completeness of material and color, and payment facilities. In general, suppliers located within Binongjati provide a credit facility for 14 days in payment.

“There are a number of things that we consider in choosing suppliers including the completeness of color, price, completeness of materials, type of material (cotton, acrylic 52/2, acrylic wool synthetic 32/2, PE polyester) and the availability of installment, although the price is more expensive we can credit within 14 days. If not through a supplier, for example directly from the factory, the payment can be within 1 month, but we need to purchase on large scale”

Next, we visualize the business network analysis of firm suppliers in Binongjati. The first graph shows that CV (limited partnership) Pribumi as the main supplier for firms in the kampong with second-tier suppliers such as Otista and Kurnia Abadi, followed by smaller suppliers that supply to less than 3 firms (Figure 3). CV Pribumi and Kurnia Abadi are suppliers for yarn while Otista supplies both yarn and supplementary raw materials such as buttons and zippers. Based on the supplier network, we can
also see that some companies in Binongjati have connections to the formal sector (CV Pribumi) to fulfill their input supply.

![Figure 3](image_url)

**Figure 3. Locations of Supplier Companies for Binongjati Firms**

The graph suggests that locations of suppliers are mainly within the city of Bandung such as Kopo, Maleber, and Cicalengka. This is confirmed with the following quote from the Binongjati firm association representative

“All raw materials in the production process are available in Bandung unless we get special requests from buyers, such as buyers who ask for raw materials made of non-synthetic wool, which we need to import”

However, besides a crucial role in supplying raw materials, these suppliers also influence production costs. For example, when certain types of raw materials are in great demand, suppliers often raise the price of raw materials, thereby affecting the price of production.

The next graph depicts the business network analysis by the rank of suppliers (Figure 4). The red edges show the main supplier, the blue edges show the second supplier, and the green edges show the third supplier. Similar to the previous graph, this graph shows that the CV Pribumi remains as the main supplier for firms in Binongjati that supply the yarn. However, the graph also shows that the firm is also the main supplier for the firms. Additionally, as the main supplier, the firm also acts as a second and third supplier, each for one firm.
Finally, we identified the customers and the types of products manufactured in Binongjati. Based on the results of the questionnaire, there are four main categories of products produced in Binongjati (Figure 5), namely fashion for women, men, children, and accessories (bags, beanies, bandanas, scarves). Based on the results of the questionnaire, 23% of the firms in Binongjati have a specialization in their production. 14% focus on women's fashion, 4% on children's fashion, and 5% on accessories. However, most companies (77%) produce both fashion and accessories per customer orders so there is no specialization in the firm.

Furthermore, we provided a graph on the location of the customers of Binongjati firm (Figure 6). The graph reveals that the largest market for Binongjati products is customers within the city of Bandung, followed by Jakarta and Tanah Abang, to be more detailed. We can see that the distribution
process also has strong links with the formal sector, such as Tanah Abang. Interestingly, two firms with customers within the Binongjati only, firms 18 and 22, operate as a finishing product firm, which suggested that these firms received sub-contracted jobs from other individuals or firms in Binongjati, such as ironing and packaging.

The green edges also showed the presence of foreign customers coming from neighboring countries such as Malaysia, Singapore, Brunei, and also farther countries including South Korea, Taiwan, and also in Africa. The graph also reveals that firms that exported to abroad, also exported to other parts of Bandung and other cities in Indonesia, suggesting the wide and established market that Binongjati firms have. The use of marketing technology through online systems is one of the causes of the widening market in Binongjati. Based on the results of the interview from Binongjati representative, the shifting from the conventional market to online can shorten the market chain and promote firms to directly distribute/sell their products.

Our network analysis suggests the sustainable production and market network that Binongjati firms have for more than a decade as found by Soedarsono [7]. However, besides its wide and established market, Binongjati has a threat that affects its marketing. Most firms in Binongjati lacks the unique design of their products. They do not have their own product label and brand packaging. The products between the firms are mostly homogeneous, resulting in fierce price competition. Based on the interview from Binongjati representative, market segmentation among firms could be seen as a business strategy to sustain the existing market.

“We don’t have unique designs, labels, and specific packaging for our products. The products seem homogeneous between craftsmen that cause price competition. I guess that we need to make segmentation for each craftsman and make a different branding strategy for each firm due to avoid price competition/market competition.” Binongjati firm association representative
5. Conclusion
The paper shows that business networks in the Binongjati creative kampong are spatially and economically wide, which can be seen from the independence of the firms in meeting raw materials and the wide distribution of products. Despite its informality and traditional craft, the knitting industry in the kampong has reached the international market. We could also see that firms in Binongjati have a complex network in both input supplies and market distributions that also involved formal sectors. This shows that the informal sector has an important role in the urban economy that should be considered for its existence in the city. The paper also highlights that the Binongjati knitting industry significantly relies on local suppliers for its production input. Thus, the industry is fragile against any disruption to the local economy in Bandung.

The paper further argues two policy implications; first, the importance to capture local knowledge and innovation to accelerate product diversification and market segmentation among firms. Second, the creative industry policy should focus to expand the market by enhancing business network analysis and business database of both supplier and customer. Thus, the local government could support informal businesses such as in Binongjati by maintaining and extending these business networks through annual trade expo, business meetings, and product promotion domestic and globally. This study contributes to the urban planning by revealing the spatial distribution and the economic impact of Binongjati firms on the urban economy.

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