Social networks and innovation (handicraft industry in Bantul, Yogyakarta)

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Abstract - This research found most of the handicraft producers have conducted various innovations during last five years. The newest innovations are managerial innovation, marketing innovation and product innovation. Meanwhile, product innovation and managerial innovation are the most important innovations in enhancing the business performance. Based on the actors, innovation in this case could be classified as producer driven innovation. The main information source of product innovation, process innovation, and service innovation is the producer's experiences itself. The study found that the role of social networks in the process of innovation activities is rather limited. This finding is also supported by a fact that the strongest social network of the producers is only the relation with family and close friend in term of their closeness, trust, and willingness to share information. Regression analysis also indicates the aggregate of social network elements does not influence the number of innovations. Components of social network that still show positive impact on the innovation are only the closeness with business partners and with members of other association. The study also suggest that research on the role of social network or social capital on innovations is need to consider more appropriate indicators of social networks. At the empirical level, differences in location or industry may require different indicators of social networks.

Key words **:** social network, innovation, handicraft industry**.**
JEL Class. **: O17, Z13**

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1. Introduction

Innovation is important for small industries. Sandee (1995) states innovation is an important strategy for small industries to strengthen their competitive position. There are many types of innovation. Van Geenhuizen & Indarti (2005) describe six types of innovation: product innovation, process innovation, service innovation, market innovation, logistics innovation, and organizational innovation. This classification is more detail than Sandee (1995) and Sandee *et al* (1991) that divided innovation only into two types: innovation product and innovation process. Innovation process refers to the changes in the production process that lead to increase productivity of labour and/or capital. This innovation does not always have an impact on the quality of output, but it reduces production costs so that competitiveness will increase. Investment for equipment repair, working capital, and raw materials are usually required in the innovation process. In this case, productivity also can be improved by organizational changes in the workplace or through a better labour division. Meanwhile, product innovation refers to the production of new products in better quality that can produce more benefit than the old ones. In practice, the adoption of product innovation requires new equipment, new inputs, changes in the division of labour within firms, and may also require the development of new trade networks that intended for the new consumer groups. Thus, basically the product innovation also includes the innovation process.

Van Geenhuizen & Indarti (2005) also mentioned that innovations can be conducted simultaneously. They emphasized that product innovation can not occur if there is no innovation process and organizational innovation since both innovations are basic requirements for product innovation. In their study on the traditional furniture industry in Jepara, Van Geenhuizen & Indarti found that the most important innovation is product innovation, followed by market innovation and logistics innovation. While Brata (2009) found that product innovation (new products, product designs and product components products) and innovation organizations (adoption of quality control of products) are the two most important forms of innovation in the case of bamboo craft industry in Sleman regency (Indonesia).

It is important to be mentioned that the process of innovation can be driven by the producers (producer-driven innovations) or by other actors (Sandee 1995: 26-33).

Therefore, there are other types of innovation based on its main actors: supplier-driven innovations, institution-driven innovations, buyer-driven innovations. Differences in the main actors of innovation can also cause differences in the process of innovation. An example of producer-driven innovations is the producers find a new production tools that can replace the traditional production process. Pioneer in this innovation is probably the advanced traditional producers who are willing and able to take the risks associated with innovation. Usually, they are producers who have good access to markets, information, government assistance, and so on. However, ordinary producers can be pioneers of innovation when they have a great opportunity to innovate if the risks and uncertainties of adoption of innovation are relatively low. In the supplier-driven innovations, suppliers of capital or technology are the main actors. They encourage producers to innovate because there is an increase of demand from producers to the suppliers. One of the important actors in the institution-driven innovations is government that provides subsidies or technological assistances to small producers. Whereas in the buyer-driven innovations, traders or other market participants (including the final consumers) is the most important actor who brought the changes. In this case, the economic size of the buyers will influence their opportunity in encouraging the producers to take innovation activities.

In other word, development of enterprises depends on their innovation activities that closely related to information or knowledge. As mentioned by Van Geenhuizen & Indarti (2005), new knowledge affects innovativeness of an industry. The new knowledge or information can be obtained from various sources such as the mass media, customers, or social networks. It indicates that in a community or cluster that has a good social capital, information will be distributed evenly and there are more opportunities for innovation.

It is consistent with Cope *et al* (2007) who underlined that the recent perspective is because economic activity deeply embedded in society, so that innovative entrepreneurs will develop their social capital by building networks that provide external sources of information, support, financial and expertise that allows for mutual learning and boundary crossing. For small or cottage industries, new information is important for innovation because innovation is essentially a knowledge-based phenomenon. A number

of studies have indicated that innovativeness of business activities is influenced by new knowledge (Van Geenhuizen & Indarti 2005).

One of the conclusions of the research conducted by the Bureau of Credit - Bank of Indonesia or BC-BI (2006) for the six clusters in Central Java is "the major challenge in cluster development in Indonesia is developing social capital or togetherness among the actors in the cluster and the resolution of conflicts that arise among actors, and this can be overcame by capacity building of actors involved in the cluster and the presence of influential local champion."

This conclusion is important in the effort to the development of micro, small and medium enterprises (MSMEs), at least for three reasons. First, the cluster approach has become a strategy in the empowerment of the MSMEs by the government institutions since small businesses or industries that are located at a cluster have a good chance to grow. Second, JICA's research (2004), as quoted by the BC-BI, stated that the clusters in Indonesia are sensitive to be dispersed by its social capital. Third, this finding supports the importance of social capital in community empowerment, including in developing small businesses. Recently, the role of social capital is increasingly noticed in various development policies.

In their study, BC-BI defined social capital as human values and society, such as mutual trust, honesty, and internal bonding, which can be grown through collective action for the common interests. It is consistent with Cope *et al* (2007) who underlined that the recent perspective is because economic activity deeply embedded in society, so that innovative entrepreneurs will develop their social capital by building networks that provide external sources of information, support, financial and expertise that allows for mutual learning and boundary crossing. For small or cottage industries, new information is important for innovation because innovation is essentially a knowledge-based phenomenon. A number of studies have indicated that innovativeness of business activities is influenced by new knowledge (Van Geenhuizen & Indarti 2005).

This paper explores the relationship between social capital or social networks and innovation in handicraft industries in Bantul, Yogyakarta, as an empirical case. A survey was conducted of 60 respondents at the Gabusan Art Market. There are two research

issues which will be discussed. First, what types of innovation occurred in these industries? Second, whether social capital plays an important role on the innovation as a channel of new information or knowledge?

2. Various sources of knowledge

Beerepoot (2007) mentions there are at least four important channels of informal knowledge absorption. These channels are observing similar producers, negative action, transmission along the value chain, and joint action. By observing similar producers in a cluster, the producers may obtain new knowledge which can be combined with their own ideas. The negative actions occur, especially when there are no friendly relationship and collaborative environment in the cluster. In situation, free-riding behaviour, pirating workers or stealing designs are form of negative actions in absorbing information at low cost although they may be seen as thieves in their clusters. The choice whether to do a negative action actually depends on this trade-off and the degree of social embedded-ness of the producers. Meanwhile, transmission along the value chain is influenced by integration in the international value chains. This integration provides more opportunity for product development or production process, but at the same time may inhibit the development of corporate functions. In this case, foreign buyers play an important role, especially if they are willing to deliver their knowledge to their suppliers. The fourth channel, joint actions among the producers are important in clusters in which the producers are concentrated in a certain location. But it is also influenced by other factors such as relations of trust among the producers, and the common language used in the cluster.

Innovation is closely related to information or knowledge. As mentioned by Van Geenhuizen & Indarti (2005), new knowledge affects innovativeness of an industry. In a community that has good social capital, information will be distributed evenly and there are more opportunities for innovation. This is an important aspect of social capital, especially as a bridging social capital. With outward looking orientation, it is possible to develop community connections and working networks with other groups that give benefit for all participants, therefore achieving a progress will be easier because there is a

continues process of ideas exchange and stimulate the development of groups and members of the community (BPS, 2006: 29).

In the case of the Europe that using a cluster analysis, Anneli *et al* (2007) for example, concluded that the differences in the dimensions of social capital brings a different impact on the innovation activities. Dakhli & De Clercq (2004) also found a positive relationship between trust and associational activity on innovation, although not as strong as the influence of human resources. Other study by Tsai & Ghoshal (1998) states that social interaction and trust were significantly related to levels of resource sharing among the business units of a large scale multinational electronics company.

Study conducted Kristiansen, Mbwambo & Wahid (2005) discuss the sources of information and relevant strategies for improving access to information that can increase adaptability and competitiveness of small enterprises in Tanzania. One of important aspects that seriously observed is the social network in which hypothesized that the extent of social networks owned by small enterprises will positively correlate with the adaptation ability. In the cases of wooden and garment entrepreneurs in Tanzania, they found that there are strong social networks. These networks are relationship with family and friends, colleagues and business associates, and religious affiliation. In the urban areas, social networks play an important role on the access to information while in other areas emphasizing the value of information about various things such as raw materials and supervision obtained through social networking. Statistical analysis also indicates that size of social networks is significantly correlated with the development of business and the number of changes made by small enterprises. The importance of social networks in determining the success of small businesses both in the early stages of business and further development was also found by Premaratne (2002) in the case of Sri Lanka.

In a study on the furniture industry in Jepara (Indonesia), Van Geenhuizen & Indarti (2005) found that innovation process is associated with the knowledge gained from in-house learning-by-doing, experiment, and from customers. In this case, business association as a formal relationship was less important as a source of knowledge because only a few of the producers joined the association since this institution was not able to meet the expectations of the members. It means that informal social network more important position than the formal one in the process of innovation in small industries. In

practice, the formation process of formal organization can be determined by external parties, such as government, not the industry itself and then lower the closeness of relations among the members. Other study in the case of entrepreneurs in the export furniture industry in Metro Cebu (Philippines) also found that the main knowledge sources for innovation are foreign buyers, trade shows (also foreign show), and magazines (Beerepoot 2007).

Wu (2008) studied the mediating role of information sharing in relation to the dimensions of social capital and competitiveness of Chinese family-owned company in Hong Kong. By using the regression approach, this study found that information sharing played an important mediating role between the three dimensions of social capital (trust, networks, and continuous transaction) and the improvement of corporate competitiveness. This finding is consistent with Atuahene-Gima & Murray (2007), also with the case in China, that the managers of companies need to pay attention to the role of social capital in improving the performance of new products because social capital have significant relation with exploratory learning and exploitative learning.

2.2. Types of Innovation

3. RESEARCH METHOD

This study focuses on the handicraft producers in Bantul district who have shop at the Gabusan Art Market located at Jalan Bantul Parangtritis, Bantul. The latest data from the manager of the market at the time of the survey was conducted showed that the Art Market Gabusan accommodates 637 producers who came are from different clusters in Kabupaten (regency) Bantul. Gradually, this art market will be able to accommodate about 8015 producers. It was also designed to improve access to international market. This market is also unique because it accommodates a variety of handicraft products based on its basic materials such as leather, metal, wood, and cloth or *batik*.

The primary data obtained by interviewing respondents at Gabusan Art Market. Interviews conducted in July-August 2009 by enumerator using a structured questionnaire which refers to previous studies such as Van Geenhuizen & Indarti (2005), Kriantiansen *et al* (2005), Sandee *et al* (1991), and Brata (2009). The questionnaire

contains questions that are divided into four groups, namely: (1) the identity of respondents and handicraft industry, (2) information about innovation, (3) information about social networks, and (4) other comments. There are 60 respondents or approximately 10 percent of the population.

In the interview, what types of innovation which are they have done in latest five years was identified. Response on this question was followed directly by other questions to assess the source of information and knowledge used in innovations, the main actors of innovations. The question of the sources of knowledge and information is used to identify social networks in innovation. Then, the respondents was asked to rate the newness of their innovation based on their self experiences in three levels (low, moderate, high). Similar method was also used in asking respondents to rate the benefit of innovations on the development of their business in handicraft industry.

To complement social network indicators based on knowledge and information sources, this study also assess how the respondents rate the level of their specific social networks (family and close friends, business partners, members of association of producers of certain kind of handicraft, and members of other associations such as ROSCAs). Each network was rated in three aspects (closeness, trust, and willingness to share the information and knowledge) also in three levels (low, moderate, high).

The paper use mainly descriptive method in analysis and followed by a regression analysis to explore relation between social networks and number of innovations. This regression uses producer's response on the question about specific social networks. Additional variables was introduced in regression are education level and size of enterprises measured by numbers of employment.

4. RESULTS AND DISCUSSION

As already stated in the previous section, the sample for this study is selected by considering the kind of handicraft. Most respondents are producers who produce handicraft that use cloth (including *batik*), wood (including primitive wood and wooden *batik*), and leather. There are also producers who produce silvers handicraft, bamboo and rattan handicraft, stone and ceramic handicraft, and various handicrafts (locally known as *aneka kerajinan*) and paintings. Based on the number of employees (paid and

unpaid), 66.7 percent of respondents are small business industries (with 5-19 employees) and the rest are micro (less than 5 employees) and medium (20-99 employees).

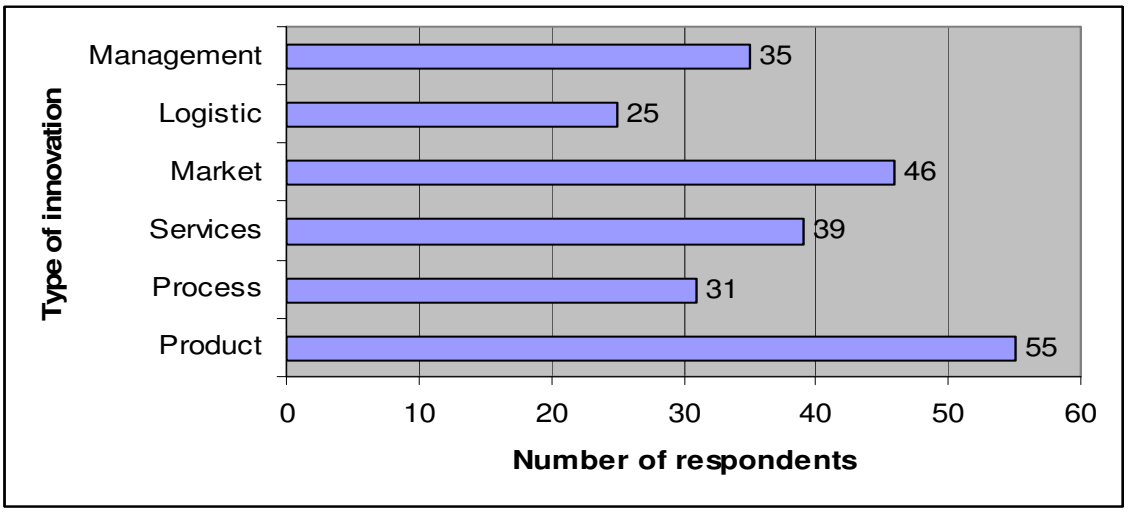
Most respondents had joined the Gabusan Art Market since the beginning of this place was established. It indicates that the handicraft producers in Bantul show positive response on the establishment of the art market in encouraging the development of their industries. Generally, the producers agree that the existence of the Gabusan Art Market is useful for them. However, they also confirm that there are some problems that lower the role of this market in enhancing the development of their business. These problems are primarily related to promotion, the role of manager of the market, and the market location that less strategic because it is relatively far from the centres of economic activity (see also, Widyastuti, 2009). Producers hope this art market will be better in the future.

4.1. Types, Newness, and Benefits of Innovation

This study found that most of respondents had innovation in the last five years. They innovate in various types of innovation. More than 80 percent of the respondents have innovated at least three types of innovation. It indicates that there are relations between different types of innovation.[1] The survey also shows that type of innovation that carried out by less than 50 percent of producers is only logistics innovation, meanwhile product innovation is carried out by most of the producers (Figure 1). This finding is in line with the case of traditional furniture industry in Jepara (Van Geenhuizen & Indarti 2005) and bamboo handicraft industry in Sleman regency (Brata 2009) that product innovation is the most important type of innovation.

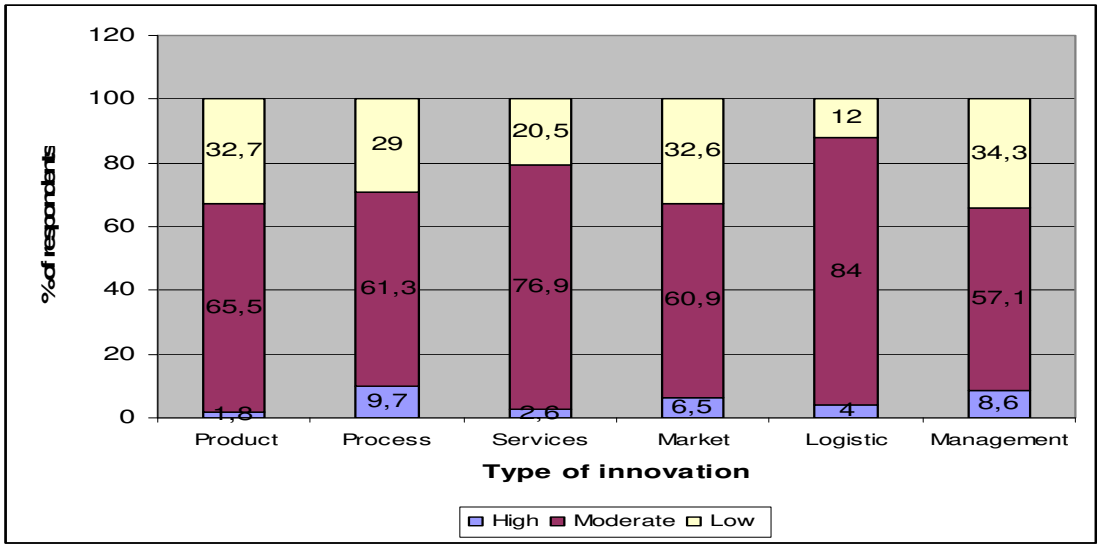
[1] These relationships among the types of innovation are also confirmed by correlation matrix (Pearson correlation).

Figure 1. Type of innovation



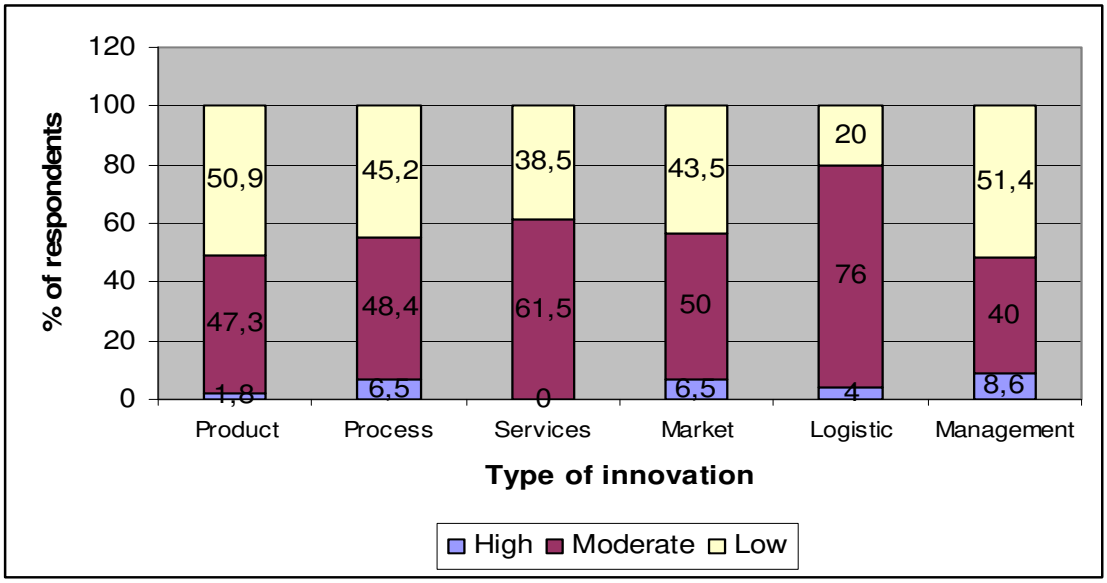
Newness is one of indicators of innovative activities. For example, in product innovation, newness arises from the existence of a new product. Figure 2 show that generally, producers classified the newness of their innovation at moderate level for all types of innovation. It indicates that a producer aware that other producers also conducted innovation then it decreases the newness of an innovation. However, it can be noted that product innovation shows higher newness than other innovations. It means that product innovation is the most important type of innovation.

Figure 2. Newness of innovation



Although innovations made by producers can vary, its important goal is to maintain or develop the business. Figure 3 shows that more than 50 percent of innovative producers choose product and management innovation as types of innovation that provide high benefits for the development of their businesses. Both innovations are also chosen by producers as the most newness innovations. It means that there is a strong relationship between level of innovation newness and the benefit of innovation.[2]

Figure 3. Benefit of innovation

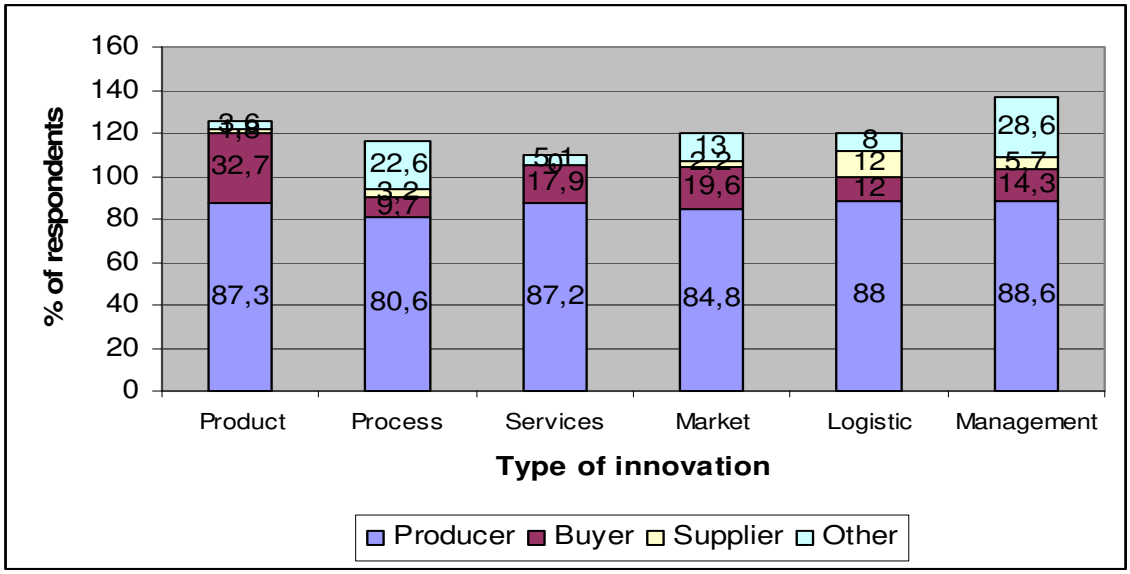


[2] The relationship between both aspects is confirmed by correlation matrix (Pearson correlation).

4.2. Social Networks and Innovation

Do social networks play important role in the process of innovation by the producers? There are two alternative ways to answer this question. First, we analyze who are the actors of innovation and then identify the sources of information or knowledge used in innovation. The second way is by conducted regression analysis on the relationships between indicators of social capital and the number of types of innovation done by the producers.

Figure 4. Actor of innovation



As shown in Figure 4, the main actor of innovation in all of types of innovation is the producers itself. Since the main actors are the producers then it can be classified as producer-driven innovation. It also gives an early indication that social networks do not contribute significantly in the innovation. However, analysis on the sources of information used in innovation may give more sufficient findings on the role of social networks.

Based on the sources of information, producer's experience in trials and errors was the main source of information in product innovation, process innovation, innovation services and managerial innovation (Table 1). While exhibition and business partner are the main information source in market innovation and logistic innovation respectively. It should be mentioned that four of twelve information sources are categorized as social networks. They are family or close friends, business partners, association of producers in

specific or similar product and other association. This social networking is expected contribute innovation taken by the producers. However, the findings indicate that the role of social networks is quite small. It confirms the finding of innovation actors. As argued by Credit Bureau - Bank Indonesia (2006), development of social capital among the actors in the business cluster is a major challenge in cluster development in Indonesia.

Table 1 Distribution of Respondents Based on Source of Information and Type of Innovation (%)

Source of information	Type of Innovation					
	Product	Process	Services	Market	Logistics	Managerial
Family/close friends	27,3	35,5	15,4	8,7	16,0	22,9
Business partners	20,0	25,8	25,6	28,3	48,0	8,6
Producers association	5,5	6,5	12,8	8,7	8,0	14,3
Other associations	3,6	0,0	0,0	8,7	4,0	2,9
Trial and error	78,2	64,5	51,3	26,1	32,0	37,1
Buyers	45,5	12,9	20,5	21,7	20,0	11,4
Suppliers	1,8	3,2	2,6	0,0	20,0	0,0
Exhibitions	32,7	19,4	23,1	45,7	8,0	17,1
Mass medias	21,8	19,4	20,5	30,4	12,0	8,6
Government agencies	1,8	12,9	7,7	17,4	20,0	31,4
Non government agencies	0,0	3,2	0,0	2,2	0,0	11,4
Business competitors	12,7	0,0	2,6	2,2	4,0	8,6

There is a question regarding this finding. Why the role of association or social network is quite limited on the industry innovation? At least there are three possible answers for that question. First, refers to social capita theory, the nature of a successful association is only if its members joined voluntarily and it was formed based on the producers' initiative. This voluntary characteristic make the members feel close to each other so that each member can be as a source of information for others. Then this social network can play an important major role in the innovation. However, due to the fact in this case did not indicate the role of association then it can be interpreted that membership in the community is likely an obligation forced by other party such the government official.

The second possibility is related to the development of association. An association which is originally voluntary and based on producer's initiatives became mismanaged later especially when its managers or organizers did not consider equally in sharing the

information or economic opportunities for the members. It may damage the image of associations so that reduce actively involvement of its members.

The third possibility is related to the nature of economic activity of association's members. In generally there is a tendency that cohesiveness among members of association in trading business stronger than in the case of producers association. In trade sector, as shown in the phenomenon of street vendors, closeness relationships between association's members is strong enough. For the traders, innovations might not be very complicated than for producers. Both of them of course face competition in their daily business activities. However, competition among traders was not to be supported by a certain innovation such product innovation which done by producers. Meanwhile for producers, the result of an innovation is important in facing competition even with other producers in a cluster especially when there was no cohesiveness among the producers.

Table 2 Distribution of Respondents Based on Elements of Social Networks (%)

Element of social network	Low	Moderate	High
Closeness relationship with:			
1.Family/close friend	0,0	35,0	65,0
2.Business partners	1,7	51,7	46,7
3.Members of producers association	0,0	63,3	36,7
4.Members of other association	1,7	61,7	36,7
Trust with:			
1.Family/close friend	1,7	35,0	63,3
2.Business partners	3,3	50,0	46,7
3.Members of producers association	1,7	65,0	33,3
4.Members of other association	1,7	70,0	28,3
Willingness to share information/knowledge with:			
1.Family/close friend	3,3	31,7	65,0
2.Business partners	3,3	55,0	41,7
3.Members of producers association	1,7	66,7	31,7
4.Members of other association	0,0	70,0	30,0

All of those possibilities are preliminary answers that need further examination empirically later. It may also require a depth examination on the process of deterioration in the perceptions of producers on the association. These works are needed to find out a better solution in optimizing the role of association as argued by the social capital theorist. In general, the above analysis indicates that social networks have not given a

strong positive impact on innovation. This finding can be reassess by taking an analysis on level of social network of producers as provided in Table 2.

Table 2 shows the overall social networking of producers with their family and close friends are stronger than with others. More than 60 percent of producers rates high for closeness, trust and willingness to share information. Then, it confirms that social network which is considered valuable for the producers is a traditional network because kinship is the dominant element. However, it should be mentioned that good networks with family and close friends do not necessarily provide direct benefits for innovation because of the kinship motive of this network is stronger than the economic or business motives. Therefore it could be understood that the main information source of innovation is only trials and errors experienced by the producers. To sum up, the overall findings imply that the role of social capital on innovation is a relatively limited.

Table 3 Summary statistics

Variable	Mean	Standard of deviation
Number of types of innovation	3,850	1,538
Education	11,850	3,394
Size of enterprises (number of employments)	9,817	14,321
Closeness relationship with:	9,817	1,432
1.Family/close friend	2,650	0,481
2.Business partners	2,450	0,534
3.Members of producers association	2,367	0,486
4.Members of other association	2,350	0,515
Trust with:	9,633	1,529
1.Family/close friend	2,617	0,524
2.Business partners	2,433	0,563
3.Members of producers association	2,317	0,504
4.Members of other association	2,267	0,482
Willingness to share information with;	9,583	1,598
1.Family/close friend	2,617	0,555
2.Business partners	2,383	0,555
3.Members of producers association	2,283	0,324
4.Members of other association	2,300	0,462
Social network index	29,033	4,059

Regression analysis will be used to reinforce those findings. Variables of social networks are based on data that made up the Table 2. Reliability tests using the Cronbach's Alpha was employed to evaluate whether the four components of each element of social networks can represent the concept of closeness, trust, and willingness.

Cronbach's Alpha of closeness relationship is 0.671, while for trust and willingness is 0.718 and 0.756 respectively. However, if all of components (12 components) are tested jointly, its Cronbach's alpha is 0.879. These statistics are quite sufficient so that all indicators of social networks can be used for each concept, as well as a single indicator (or composite) of social networks. The indexes are a summation of respective elements. Other control variables used in the model are education (proxy by years of schooling) and size of enterprise (proxy by number of employments). All of independent variables are hypothesized have positive influence on the number of type of innovation has already done by producers. Summary statistics and regression results are provided in Table 3 and 4 respectively.

There are only two variables in Model A that significantly influence the number of varieties or types of innovation. Both variables are closeness with business partners and with members of other associations. Since their regression coefficients are positive then it means that higher closeness with business partners and with members of other associations will increase variety of innovations. In Model B, variable that significantly influence innovation is only the index of closeness elements. While in the Model C, the composite index of 12 elements of social network does not have a significant effect on the numbers of types, even at 10 percent level of significance. The intercept which is relatively large and significant confirms that innovation is closely related to the producers itself. These findings support the result of descriptive analysis above.

Table 4 Regression results (dependent variable: number of types of innovation)

Variable	A	B	C
Constant	4,724 (3,090)*	4,530 (3,037)*	5,391 (3,479)*
Education	0,023 (0,382)	-0,014 (-0,245)	0,006 (0,108)
Size of enterprises (number of employments)	0,007 (0,481)	0,017 (1,302)	0,018 (1,261)
Closeness relationship with:		0,436 (2,527) **	
1.Family/close friend	-0,522 (-1,001)		
2.Business partners	1,206 (1,817)***		
3.Members of producers association	-0,869 (-0,979)		
4.Members of other association	1,587 (2,093)**		
Trust with:		-0,148 (-0,642)	
1.Family/close friend	0,667 (1,302)		
2.Business partners	1,067 (-1,308)		
3.Members of producers association	1,243 (1,258)		
4.Members of other association	-0,999 (-1,381)		
Willingness to share information with;		-0,369 (-1,638)	
1.Family/close friend	-0.736 (1,624)		
2.Business partners	-0,085 (0,102)		
3.Members of producers association	0,083 (0,131)		
4.Members of other association	-0,993 (-1,111)		
Social network index			-0,062 (-1,238)
Adjusted R^2	0,336	0,187	0,049
F-test	1,628	2,482	0,963

Note: in ( ) are t-statistics, * significant at1%, ** significant at 5%, *** significant at 10%.

5. CONCLUSIONS

This research found that most of the respondents have conducted various innovations during the last five years. The newest innovations are managerial innovation, marketing innovation and product innovation. Meanwhile, product innovation and managerial innovation are the most important innovations in enhancing the business performance. Based on the actors, innovation in this case could be classified as producer driven innovation. The main information source of product innovation, process innovation, and service innovation is the producer's experiences itself.

The study found that the role of social networks in the process of innovation activities is rather limited. This finding is also supported by a fact that the strongest social network of the producers is only the relation with family and close friend in term of their closeness, trust, and willingness to share information. Regression analysis also indicates the aggregate of social network elements does not influence the number of innovations. Components of social network that still show positive impact on the innovation are only the closeness with business partners and with members of other association.

The study also suggests that research on the role of social network or social capital on innovations needs to consider more appropriate indicators of social networks. At the empirical level, differences in location or industry may require different indicators of social networks.***

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