The use of fuzzy in determining the potential entrepreneur

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Abstract. Unemployment in Indonesia both in the village and in the city from year to year increase, because the number of workers who are not absorbed, and entrepreneurship is one solution. There are so many traits an entrepreneur must have to be successful, including risk taker, persuader, ambitious, skill, lead, and others. This entrepreneurial group has several criteria. Entrepreneur with high potential for success is to have eight qualities: reliable, broad network, training, serving, managing, experiencing, seeing opportunities and cooperation. Entrepreneurs who have the potential to succeed have five of the eight properties and low entrepreneurship has three of the eight properties. This research was conducted in Surian Subdistrict of Sumedang District with sample of 105 people taken at random. The purpose of this study is to determine entrepreneurship that has the potential for high success, medium and low. In addition to determining the constraints of becoming a successful entrepreneur. The results of research useful for aspiring entrepreneurs is to detect the odds of success in business, so it can determine the direction in developing the potential it has.

1. Introduction

Surian Sub-district is located in the sub-watershed of Cikandung, Cinunagara of Sumedang District. Economic growth in Surian Sub-district is still low when compared to the economic growth of Sumedang District. This indicates the lack of synergy between subsector of agriculture, industry, service sector and others. Although the economic growth is still low, there are several community groups that start their business by utilizing the existing materials, increasing their added value by processing them. Products produced include bananas to become banana chips, the heart of bananas to shredded bananas, soybeans to become tofu and banana waste into organic fertilizer

In farming, farmers in Surian Subdistrict joined 5 combined farmer groups (gapoktan), namely Ranggamukti Jayasari, Giri Mukti, Suriatani, and Tunas Harapan. Cultivated commodities in the wetland and heterogeneous gardens were wetland paddy (6,324 quintals), soybean (1,791 quintals), tree yam (140 quintals), corn (357.43 quintals), sweet potato (120 quintals), fruits, and various timbers. The livestock farming included beef cattle (1,209 heads), goats (1,773 heads), sheep (1,766 heads), chicken (28,600 heads), and duck (1,805 heads). In addition, in the field of fisheries, types of fish that were mostly cultivated were carp (16,544 kg) and parrotfish (15,540 kg) [1].

Seeing the many potential villages that can be developed, of course, entrepreneurs are needed in developing their villages. The purpose of this study is to analyze which community clusters have the potential to become entrepreneurs with high, medium and low success rates. The nature of the community is how to potentially become an entrepreneur with high, medium and low success rates, and obstacles to becoming a successful entrepreneur.
In this study the cluster is a potential for success in becoming an entrepreneur, whether the success is high, medium or low by looking at the characteristics possessed by entrepreneurs such as risk takers, persuader, ambitious, performance and leadership attitudes.

2. Methods

2.1. Fuzzy C Mean

Fuzzy c-mean (FCM) [4] is regarded as representative of fuzzy partitioning clustering algorithm due to its numerous applications in various fields. The objective function in FCM is minimized under two constraints, namely, the recommended number of cluster and objects may belong to different cluster with different membership values. Since it was proposed along with its convergence [5], therefore convergence was studied primarily on two different levels: numerical and stochastic convergence [6], local and global convergence [7]. Numerical convergence informs about the rate of convergence and stochastic convergence decides accuracy level of obtained minimal. The convergence proof in FCM was a paramount importance, because it shows that the observation point can be moved anywhere by the user without impairing the convergence of the algorithm [8]. The convergence doesn’t guarantee that the algorithm converges to a saddle point [9]. Hence clustering results obtained by FCM may not be optimal, which means its performance over some real world datasets can be further enhanced. So, researchers improvised FCM by its hybridization with other techniques. Sudha et al [10] proposed the optimal fuzzy rule based FCM clustering method for load frequency control. In order to reach more accurate forecast, Errioglu et al [11], studied a hybrid fuzzy time-series by employing FCM clustering and artificial neural network. The application neural network can be seen in Deliana Yosini and I.A.Rum [12]. By exploiting FCM and adaptive neuro-fuzzy inference system, Sezer et al [13], studied the use of synthetic data in the indirect determination of rock strength. In [12], author have proposed conditional spatial FCM clustering algorithm, which give improved robustness than traditional FCM algorithm. Zhang et al [13] proposed a clustering model in which they have incorporate probabilistic information granules of missing values into FCM clustering with the help of maximum likelihood criterion.

In this study the cluster is a potential for success in becoming an entrepreneur, whether the success is high, medium or low by looking at the characteristics possessed by entrepreneurs such as risk takers, persuader, ambitious, performance and leadership attitudes.

2.2. Data

This research was conducted from March to June 2017 in Surian Sub-district, Sumedang District. Respondents were taken by simple random sampling as many as 105 respondents. Variables to detect whether someone is potential for entrepreneurship is the ability to be a successful entrepreneur (Y), the nature of risk taker (X1), persuader (X2), ambitious (X3), performance (X4) and can lead (X5). Each variable exists eight indicators measured by a Likert scale of 1-5. The variables and indicators are as follows:
### Table 1. Variable and indicator.

| Variable          | Indicator                                                                 |
|-------------------|---------------------------------------------------------------------------|
| X1 = Risk taker   | 1. Apply a different way                                                  |
|                   | 2. New innovation                                                         |
|                   | 3. New business                                                           |
|                   | 4. Broker                                                                 |
|                   | 5. Afraid of failure                                                      |
|                   | 6. Estimated business                                                     |
|                   | 7. Develop a business                                                     |
|                   | 8. Adventurous spirit                                                     |
| X2 = Persuader    | 1. Influence                                                              |
|                   | 2. Good sales                                                             |
|                   | 3. Good idea                                                              |
|                   | 4. Character policy                                                       |
|                   | 5. Self-conscious                                                        |
|                   | 6. Do not following advice                                                |
|                   | 7. Stubborn                                                               |
|                   | 8. The ability to speak in public                                         |
| X3 = Ambitious    | 1. Satisfied                                                              |
|                   | 2. Work spirit                                                            |
|                   | 3. Exceeds working hours                                                  |
|                   | 4. Plan targets                                                           |
|                   | 5. High curiosity                                                         |
|                   | 6. Not sure the results                                                   |
|                   | 7. A strong desire to move forward                                        |
|                   | 8. Looking for calculations/risks                                          |
| X4 = Performance  | 1. Have advantages                                                       |
|                   | 2. Happy crowd                                                            |
|                   | 3. Initiate                                                               |
|                   | 4. Appear in public                                                       |
|                   | 5. Happy to be the center of attention                                    |
|                   | 6. Less fortunate                                                         |
|                   | 7. Argumentative                                                          |
|                   | 8. Person in charge                                                       |
| X5 = Leader       | 1. Lead                                                                   |
|                   | 2. Charismatic                                                            |
|                   | 3. Always want to lead                                                    |
|                   | 4. Always guide                                                           |
|                   | 5. Firm and polite                                                        |
|                   | 6. Take possession of responsibility                                      |
|                   | 7. Aspire to be a great leader                                            |
|                   | 8. Can manage the budget                                                  |
| Y = traits that must be possessed by entrepreneurs | 1. Reliable                                                               |
|                   | 2. Having a wide network                                                  |
|                   | 3. Take part in training                                                  |
|                   | 4. Serve                                                                  |
|                   | 5. Manage                                                                 |
|                   | 6. Experience                                                             |
|                   | 7. Seeing an opportunity                                                  |
|                   | 8. Cooperation                                                            |
Table 2. Entrepreneurs who have the potential to succeed well.

| Variable | Indicator |
|----------|-----------|
| Y1= Entrepreneurs who have the potential to succeed with good criteria | 1. Reliable  
2. Having a wide network  
3. Following diligent training  
4. Serve  
5. Manage  
6. Experienced  
7. Seeing an opportunity  
8. Cooperation |

Table 3. Entrepreneurs who have the potential to succeed with medium criteria.

| Variable | Indicator |
|----------|-----------|
| Y1= Entrepreneurs who have the potential to succeed with good criteria | 1. Reliable  
2. Having a wide network  
3. Manage  
4. Seeing an opportunity  
5. Cooperation |

Table 4. Entrepreneurs who have the potential to succeed with low criteria.

| Variable | Indicator |
|----------|-----------|
| Y1= Entrepreneurs who have the potential to succeed with good criteria | 1. Lazy in training  
2. Serve  
3. Experienced |

3. Results and Discussion

3.1. Cluster Potential Entrepreneur

In general, Surian sub-district residents in Sumedang district have the potential to become entrepreneurs with medium success (89.52%), while the potential to become an entrepreneur with high success is very small (3.80%). Similarly, the low success rate is very small (6.67%). This is because farming, raising livestock has become a culture for the people there. Farming and livestock activities are the same every year, making the community there a risk averter, avoiding risks.

The Communities that have the opportunity to become successful entrepreneurs are groups that are happy with change, receive new information and innovations. This group becomes a risk taker, is not afraid of failure, becomes a pioneer and usually rarely wants to share. Whereas the community that has the potential to be a low-level entrepreneur is a group that is comfortable with their daily lives, if becoming a farmer is still a subsistence farmer means that the results of their farming are not traded and for their own consumption.

Table 5. Cluster Potential Entrepreneur.

| No. | Fuzzy c mean value calculation | Criteria | Amount (people) |
|-----|-------------------------------|----------|-----------------|
| 1   | 0.038095                      | High     | 4               |
| 2   | 0.895238                      | Medium   | 94              |
| 3   | 0.066667                      | Low      | 7               |
|     |                               | Amount   | 105             |
3.2. Characteristic High, Middle and Low Potential Entrepreneur

Community groups that have the potential to become entrepreneurs with high success criteria are migrants, often active in village meetings, between 41-55 years old, less than 15 years in the village, experience between 15-30 years and women in addition this group has a small family member, an undergraduate education, his job is trading and his income is between 8-12 million per month. Complete high characteristics, middle and low potential entrepreneurs can be seen in Table 6.

| Information          | High | Medium | Low   | Information          | High | Medium | Low   |
|----------------------|------|--------|-------|----------------------|------|--------|-------|
| Population           | 4    | 53     | na    | Gender               | Male | 1      | 35    | 5     |
| Immigrant            | na   | 41     | 7     | Female               | 3    | 59     | 2     |
| Village              |      |        |       | Amount of Family     |      |        |       |
| Meeting              |      |        |       |                     |      |        |       |
| Often                | 1    | 30     | 4     |                     | 1    | 2      | 2     | 48    | 3     |
| Rather               | 2    | 49     | 1     |                     | 3    | 4      | 1     | 31    | 2     |
| Rarely               | 1    | 15     | 2     |                     | 5    | 6      | 1     | 13    | 2     |
| Age                  | 25 - 40 | 2    | 48    | 1                    |      |        |       |       |
| 41-55                | 1    | 40     | 1     | Education            | 1    | 27     | 5     |
| > 55                 | 1    | 6      | 5     | High Senior School   | 1    | 58     | 2     |
|                      |      |        |       | S1 (Bachelor)        | 2    | 9      | Na    |
| Length of stay       | 1    | 20     | 2     | Job                  |      |        |       |
| < 15                 | 3    | 30     | 4     | Farmer               | 1    | 20     | 2     |
| 16 - 55              | 1    | 35     | 2     | Seller               | 2    | 52     | 4     |
| > 55                 | na   | 29     | 1     | Argo-industry        | 1    | 22     | 1     |
| Experienced          |      |        |       | Income/month         |      |        |       |
| < 15                 | 1    | 28     | 3     | < 8 Million          | 1    | 45     | 5     |
| 15-30                | 2    | 50     | 3     | 8 - 12 Million       | 2    | 40     | 1     |
| >30                  | 1    | 16     | 1     | > 12 Million         | 1    | 9      | 1     |

3.3. Constraints to becoming a successful entrepreneur

The results revealed that the constraints of being successful entrepreneurs include worrying and fear of failure (65%), no capital (42%), no skills or ability to do business (70%), no place to open a business (36%), fear of leaving work as long as (78%), confused about what to do (74%) and lazy (46%).

4. Conclusion

In Surian sub-district the community has the potential to become successful entrepreneurs with a good 3.80%, medium potential 89.52%, and low 6.67%. Community groups that have the potential to become entrepreneurs with high success criteria are migrants, often active in village meetings, between 41-55 years old, less than 15 years in the village, experience between 15-30 years and women in addition this group has a small family member, an undergraduate education, his job is trading and his income is between 8-12 million per month. While the dominant obstacle is to be a successful entrepreneur, among others, fear of leaving your original job, what kind of confused you want to be and not having skills or abilities.

To grow the entrepreneurial spirit must be given continuous training, looking for a solid group and that continues to be fostered so as to become a pilot project of success. So, the important thing is to
maintain cohesiveness between groups. Many government programs failed, because assistance was given to groups that were not solid and instructions from above.

5. References
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