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Factors Affecting the Capacity of Millennial Farmers in Chili Farming Community in Garut Regency

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Abstract:- Samarang is one of important subdistricts in Garut Regency for producing vegetable and fruit commodities that have high economic value besides as a tourist destination. However, the production of vegetable, particularly chili, highly fluctuates, due to several factors including poor business management, hence deep investigation related to farmer capacity in chili farming management is required. This study was conducted from April-June 2020 with aim to: (1) describe farmer capacity in chili farming, (2) analyze factors affecting farmer capacity, and (3) formulate strategy to increase farmer capacity in chili farming. The study was done with quantitative approach and supported by qualitative data in Samarang Subdistrict which was purposively selected with consideration that the location is a vegetable producing area and located near the capital of Garut. The population amounted to 102 people consisted of young people at age between 20 - 40 years old as millennial farmers. Sample was determined using the Slovin's formula and resulted in 80 respondents. Data were collected through direct interview using close-ended questionnaire that has been tested for its validity and reliability. Data analysis was done in two techniques; namely descriptive analysis to explain the performance of independent variable, and multiple linear regression analysis to investigate factors affecting farmer capacity. Result of the study showed that farmer capacity in performing chili farming in Samarang Subdistrict belonged to the moderate category, factors found to affect farmer capacity included age, farming experience, production facility and infrastructure, and farmer group support. Moreover, the strategy to build capacity is done by performing extension to farmers based on the indicator of capacity examined. The selection of extension material should be done through descriptive analysis according to the lowest value of indicator in chili farming capacity.

Keywords:- *Capacity, Farming, Chili, Millennial Characteristics, Multiple Linear Regression.*

I. INTRODUCTION

Agriculture remains the main support of community life in Samarang Subdistrict, Garut Regency since people in the region mostly work as farmer and farm worker. As an agricultural area in Samaran Subdistrict, many horticultural commodities, mainly medium high to highland vegetables, including chili, were grown by farmers. This area is potentially used as chili producing area since a total of 81 ha is farmed for chili cultivation. However, according to the data obtained, chili production was not yet optimal. Based on the data, chili production in 2013, 2014 and 2017 fluctuated and tended to decrease. In 2013, chili production reached 1.065 ton and further increased in 2014 to 1.511 ton, but the production decreased in 2017 to a quantity of 1.053 ton. Similarly, productivity of red chili decreased over years. In 2001, productivity reached 178. 9 ton per ha but decreased to 144.7 ton in 2008, while the demand continued to increase. One of local chili farmers informed that fluctuation of chili production is caused by several factors, such as: lack of human resources, especially extension workers and skilled worker, low capability of farmer in managing farming business, decreasing soil fertility, pest and disease attack in plants, and low interest of farmers to access information and technology about chili framing.

Result of study done by Effendy & Badri (2020) in Sindangkasih Ciamis concluded that farmer capacity to manage farming business was significantly affected by extension activity. Moreover, Effendy *at. al*. (2020a) confirmed that rural youth capacity significantly influenced the acceleration of farmer regeneration. Furthermore, change in farmer behavior in performing farming was determined by characteristics, communicative behavior, business climate, perception of farmer about extension, and characteristics of innovation (Effendy *at.al.* 2020b). Based on field observation and preliminary information obtained from extension workers, farmer capacity in performing chili farming in Samarang Subdistrict was still considered low, thus the focus of research problem is the low capacity of farmer in managing farming business, particularly chili farming business. Therefore, it is necessary to conduct deep investigation related to capacity building of chili farmer towards modern farmers or those with millennial characteristics to increase farmer knowledge and capability. Based upon the focus of the problem, this study was aimed to: (1) describe farmer capacity in managing chili farming business, (2) analyze factors affecting farmer capacity

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building, and (3) formulate model and strategy to build farmer capacity in the management of chili farming business.

Research Framework

Farmer capacity building is determined by several factors, both internal and external factors. Based on the background, problem formulation, and objectives of this study, research framework designed was consisted of; 1) Individual characteristics as variable (X_1), included age, level of formal education, farming area, farming experience, and number of dependent in family; 2) Competence (X_2) included planning, implementation, and evaluation in chili farming; 3) External support as variable (X_3) consisted of production facility and infrastructure, farmer group, extension activity, access to information and technology, and government support; and 4) Farmer capacity in performing chili farming as variable (Y) which included managerial, technical, and socio-economic aspect in chili farming. Systematically, research framework is presented in Figure 1.

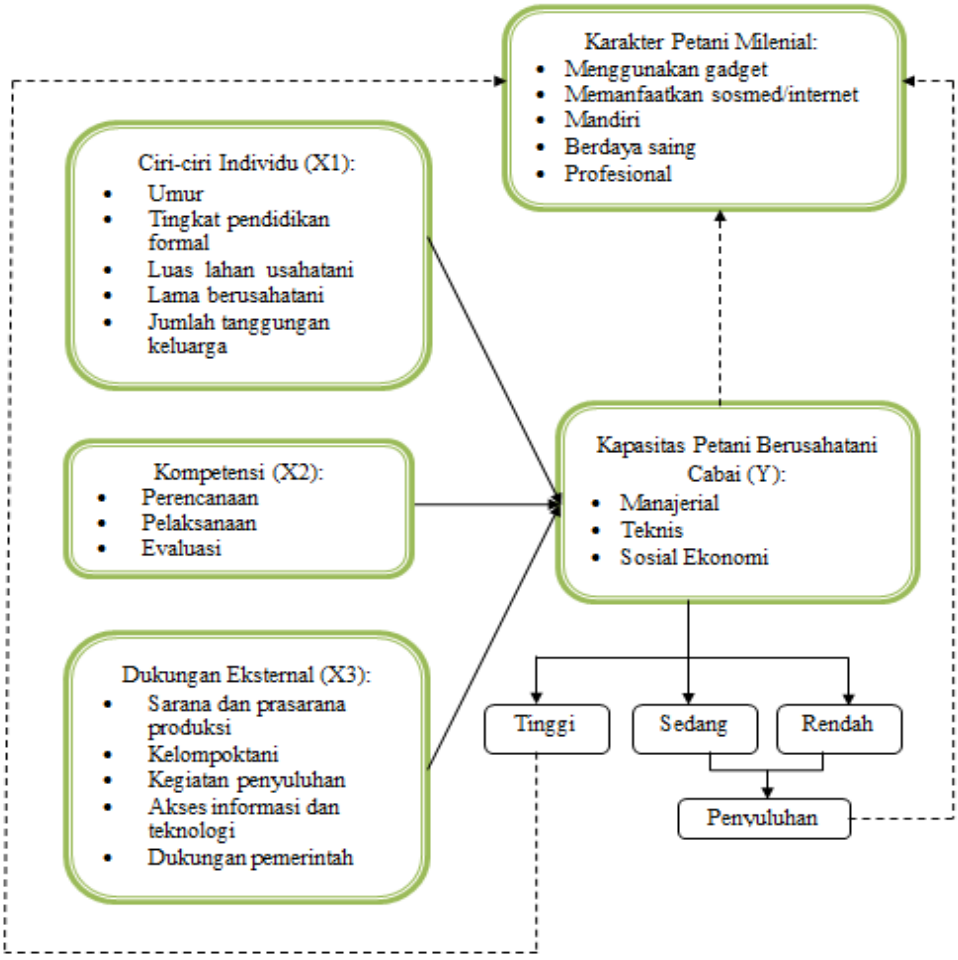

Figure 1. Framework of Research Hypothesis

II. RESEARCH METHODS

This study used quantitative approach and supported by qualitative data obtained through survey. The study was conducted for 4 months (March-June 2020) in Village of Cisarua, Parakan, and Tanjung Anom, Samarang Subdistrict, Garut Regency. This research is explanatory research to answer whether a variable has a correlation with other variable. A total of 102 chili farmers were determined as the population of this study, selected from three village at age of 20-40 years old. Determination of sample was done using Slovin's formula with margin of error of 6 percent to produce sample size of 79.4, rounded to 80 respondents. However, due to Covid-19 pandemic, only 52 farmers were able to be interviewed.

The data collected consisted of primary and secondary data. Primary data were collected through observation and direct interview using questionnaire, while secondary data were obtained from information provided from extension workers and documents in the form of extension reference manual of BPP Samarang Subdistrict. The instrument used was questionnaire contained 99 questions with available options of answer (close-ended question) based on variable and indicators determined. Before baing used to collect data, questionnaire was tested for its reliability through reliability test which resulted in *Cronbach's Alpha* of 0,878, thus the

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instrument was considered stable and reliable as data collection tool (Sugiyono. 2013).

The data analysis applied were descriptive analysis to explain the performance of research variable, and multiple linear regression to analyze factors affecting farmer capacity building using the equation $Y = a + b_1.X_1 + b_2.X_2 + b_3.X_3$

Data analysis was done using *Software IBM SPSS* version 25. Moreover, formulation of strategy was resulted from descriptive analysis and linear regression analysis.

III. RESULTS AND DISCUSSION

Characteristics of Respondent

Result of descriptive analysis showed that age of respondent was dominated by age group of 39 - 40 years old (35%). Education level was dominated by Elementary School or SD (62%), farm area cultivated was dominated (40%) by farm area of 10.000 - 50.000 m^2, farming experience was averagely of 6 - 25 years, and number of dependent in family was dominated by 3 people (33%). In detail, performance of individual characteristics of respondent is depicted in Figure 2.

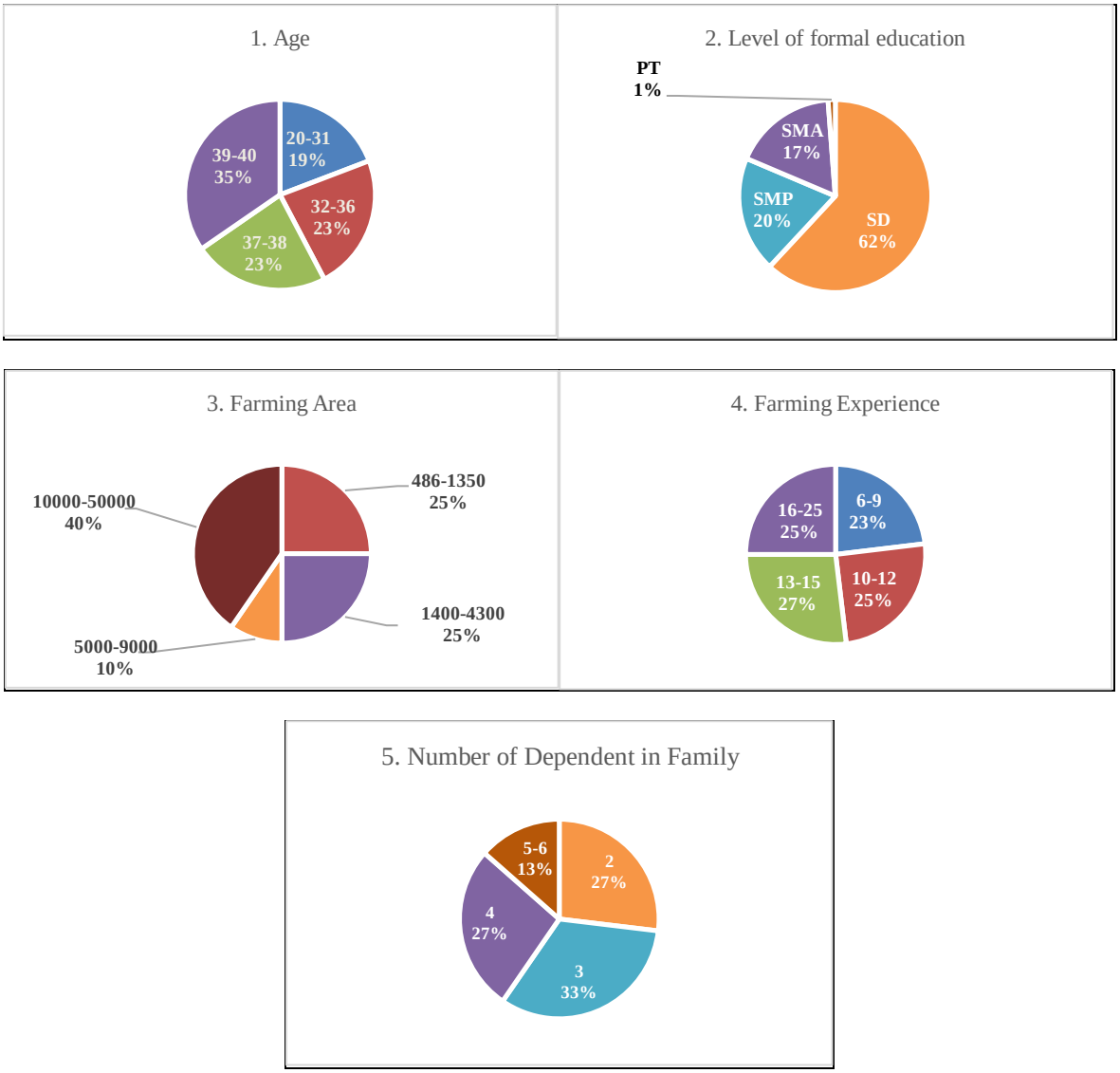

Figure 2. Performance of Respondent Characteristics

Based on Figure 2.1, performance of respondent characteristic in this study indicated that age group of farmer was between 20 - 40 years. Age distribution in each group was relatively equal, yet the percentage of age group of 30 - 40 years was slightly higher of 35 percent, while other age group ranged of 19 - 23 percent. In term of formal education distribution, (Figure 2.2), farmers mostly completed Elementary School/SD (61.5%), followed by Junior High/SMP (19.3%), Senior High/SMA (17.3%), and Higher Education/PT of only 1.9 percent. Concerning farming area (Figure 2.3), farmers mostly cultivated chili in area of 10.000-50.000 m^2 (40.4%), followed by 486-1.350 m^2 and 1.400-4.300 m^2 with the same value of 25%, and the rest of 9.6 percent of farmers performed chili farming in area of 5.000-9.000 m^2. In term of farming experience (Figure 2.4), respondent mostly had experience of 13-15 years (26.9%),

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followed by similar percentage of 25% for experience of 16-25 years and 10-12 years, and farmers lastly had 6-9 years of farming experience (23.1%). Based on Figure 2.5, most farmers had 3 dependents (32.7%), 2 and 4 dependents (26.9%), and 5-6 dependents (13.5%) in family.

Competence of Respondent

As described in research method, the competence of respondent in this study was measured based on farmer's competence in planning business, implementing (running) business, and performing evaluation of business which is presented in Figure 3.

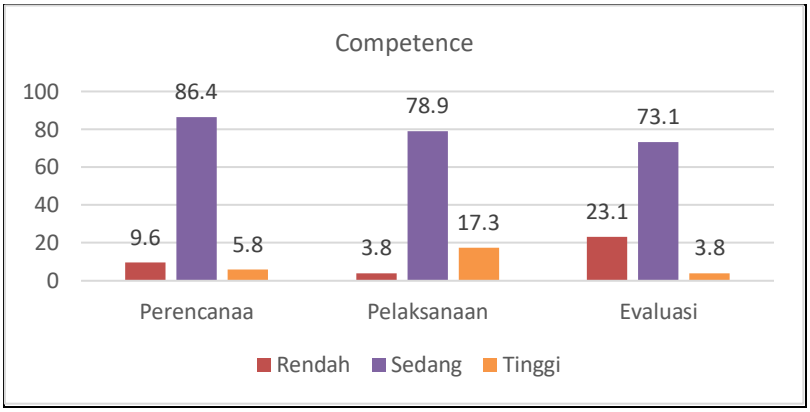

Figure 3. Performance of Respondent Competence

Figure 3 explains that the three competence indicators of respondents, namely business planning, implementation, and control or evaluation were included in moderate category. Most respondents (86.4%) assumed that business planning belonged to moderate category. Similarly, about 78.9 respondents believed that business implementation was in moderate category, and 73.1 percent of respondents considered business control or evaluation also belonged to moderate category. This result indicated that farmer competence in performing farming business should be improved.

External Support

In this study, external support was represented by facility and infrastructure, farmer group support, extension activity, ease of access to information and technology, and support of government program. Based on the result of descriptive analysis, performance of external support belonged to the moderate category as presented in Figure 4.

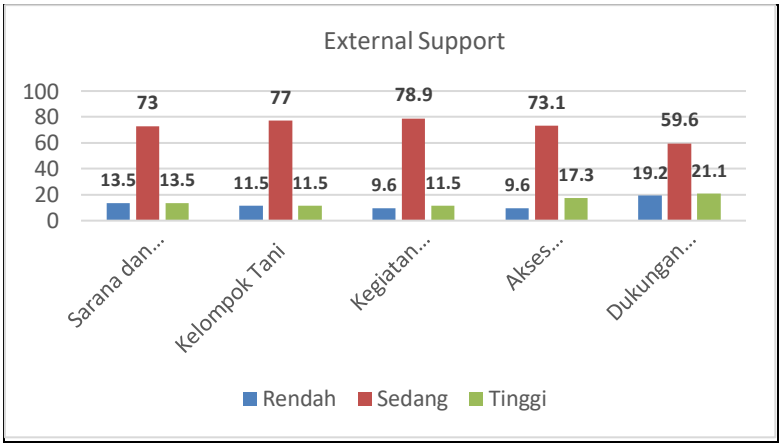

Figure 4. Performance of External Support

Figure 4 depicts that all indicators of external support which consisted of the support of facility and infrastructure, farmer group support, extension activity or program, and support of government program were included in moderate category. Respondent mostly (78.9%) agreed that the support of extension program was in moderate category as well as farmer group support as most respondents (77%) put this support into moderate category. Similarly, 73% of respondents also perceived that support of facility and infrastructure was still moderate, while about 59.6% of farmers considered that support of government program was still moderate, thus improvement is necessary.

Farmer Capacity in Performing Chili Farming

Farmer capacity in this study is represented by the managerial, technical, and socio-economic capacity. Result of descriptive analysis showed that each indicator belonged to the moderate category as illustrated in Figure 5.

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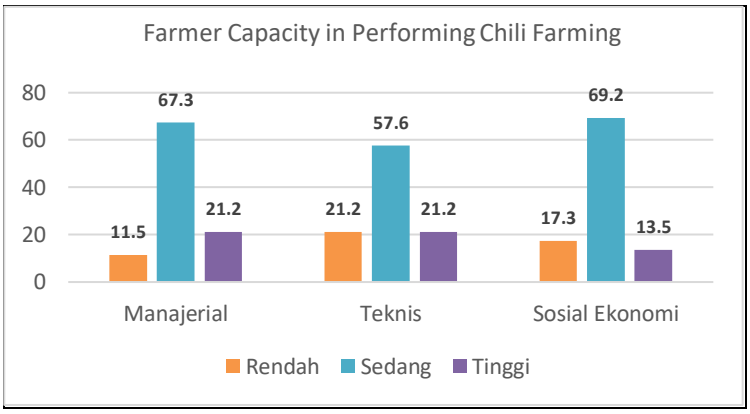

Figure 5. Farmer Capacity in Performing Chili Farming

In relation to farmer capacity (Figure 5), respondents majorly agreed that all capacity indicators were included in moderate category. About 69.2 percent of respondents assumed that socio-economic capacity belonged to moderate category. Similarly, 67.3 percent of respondents considered that managerial capacity was included in moderate category, and around 57.6 percent of total respondents perceived that technical capacity was also in moderate category. Result of this study indicated that capacity building of farmer in performing chili farming is required.

Factors Affecting Farmer Capacity

Analysis result of multiple linear regression on all indicators of variable shows that several indicators significantly affected youth capacity building ($p<0.005$), namely individual characteristic (X_1) which was represented by age (X_{11}) and farming experience (X_{14}), external support (X_3) which was reflected by the support of facility and infrastructure (X_{31}) and farmer group support (X_{32}) with equation: $Y = 3.180 - 0.025X_{11} - 0.026X_{14} + 0.196X_{31} + 0.071X_{32}$ as presented in Table 1.

Table 1. Coefficient of Correlation of Each Indicator of Variable

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,180	,748		4,250	,000
	$X_{1.1}$	-,025	,012	-,398	-2,142	,039
	$X_{1.2}$	,035	,022	,243	1,628	,112
	$X_{1.3}$	,009	,010	,159	,938	,354
	$X_{1.4}$	-,026	,010	-,403	-2,555	,015
	$X_{1.5}$	,005	,016	,056	,315	,755
	$X_{2.1}$	-,098	,062	-,241	-1,593	,119
	$X_{2.2}$	-,134	,119	-,186	-1,127	,267
	$X_{2.3}$	,055	,048	,175	1,153	,256
	$X_{3.1}$	,196	,096	,313	2,048	,047
	$X_{3.2}$	,071	,035	,289	1,994	,053
	$X_{3.3}$	,054	,073	,108	,743	,462
	$X_{3.4}$	-,007	,038	-,025	-,173	,864
	$X_{3.5}$	-,039	,035	-,170	-1,101	,278
a. *Dependent Variable: Y (Farmer Capacity)*						

Effect of Individual Characteristics on Farmer Capacity

Result of regression analysis (Table 1) showed that individual characteristics (X_1) significantly affected the improvement of respondent capacity in chili farming ($p<0.005$). The indicators that represented this effect were age (X_{11}) and farming experience (X_{14}). Based on the result of descriptive analysis on individual characteristics (Figure 2), it was found the age of respondent ranged of 19 - 40 years old, and the farmers majorly included in age group of 30 - 40 years old (35%). The majority of respondent (62%) completed Elementary School/SD, farming area of 10.000 - 50.000 m^2 was dominantly (405) owned by farmers. Moreover, farmers (25%) were found to have farming experience of 6 - 25 years, but most of them (25% of each) have farmed for 10 - 12 years and 16 - 25 years. In addition, number of dependent in family was dominated (33%) by quantity of 3 people. These results indicated that both factors determined respondent capacity in performing chili farming. To say, age and farming experience of farmers should be considered to build their capacity in performing chili farming. This result confirmed the study conducted by Subagio (2008), Nasrul (2012), Herman (2008), Balaji (2015), and Veronice *et.al.* (2018) which found that factors contributed to capacity building included: farmer group support, learning intensity of farmer, the role of extension worker, effect of outsider, support of local wisdom, and

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farmer characteristics. This result was also supported by the finding of study carried out by Effendy & Badri (2020) which concluded that farmer capacity was significantly influenced by individual characteristics which consisted of; age, farming experience, formal education, and non-formal education. Suhartini *at.al*. (2015) mentioned that farming experience will teach farmers how to deal with certain situations and make right decision by considering their former experience. This condition was also in line with Nurbaeti (2016) where formal education will affect behavior, mindset, creativity, and skill of farmers in performing farming business. Similarly, Effendy *et.al.* (2020) concluded that youth capacity to accelerate farmer regeneration was determined by age, education level, and cosmopolite level. Farmer capacity was also influenced by external factor as mentioned by Effendy & Badri (2020), that external factors, namely farmer group support, information technology, and business capital have affected farmer capacity in running farming business.

Effect of Competence on Farmer Capacity

Result of regression analysis (Table 1) showed that competence (X_2) provided insignificant result to respondent capacity building in chili farming business ($p>0.005$).Result of descriptive analysis (Figure 3) indicated that most respondents have competence in business planning, implementation, and control or evaluation, which fell into moderate category, thus improvement is necessary. To interpret, young chili farmers or respondents in Samarang Subdistrict believed that they have sufficient competence to run chili farming business. Based on the result of depth-interview with several farmers, their farming skill was inherited over generations, while other skills obtained from training and technical assistance were only considered as supplementary skills since they assumed to already master the basic skill. This finding was in line with Effendy *et.al.*(2020) who concluded that farmer behavioral change was affected by many factors, such as: communicative behavior, perception about extension, and characteristics of innovation, hence it was not only obtained from training or technical assistance.

Effect of External Support on Farmer Capacity

Result of regression analysis (Table 1) indicated that external factors (X_3) significantly affected respondent capacity building in chili farming ($p<0.005$). The indicators that represented this effect were support of facility and infrastructure (X_{31}) and farmer group support (X_{32}). This finding showed that both factors determined respondent capacity in chili farming, therefore, farmer capacity building in chili farming should be supported by the availability of adequate facility and infrastructure besides the support of farmer group. Result of descriptive analysis (Figure 4) showed that all indicators that measured external support obtained score that belonged to moderate category, reflecting the role and existence of external factor support should be optimized. Effendy *et. al*. (2020a) concluded that external factor which consisted of: farmer group support, business capital support, and information technology also determined farmer capacity in farming business, that is in term of capability or skill in farming business planning, technical skill related to innovation, skill to evaluate and control farming business, solve problem, adapt to innovation, and establish partnership network. Similarly, Pradiana, & Rahmawati (2020) mentioned that external factors included: availability of information source, family support, and fellow support also determined youth empowerment level to perform chili farming in Ciamis Regency. Farmer capacity was indirectly influenced by other factors as confirmed by Effendy (2020), such as; support of extension institution, characteristics or attribute of innovation, and support of farmer institution. Moreover, Effendy *et al*. (2020b) also mentioned that farmer behavioral change was influenced by communicative behavior, perception about extension, and characteristics of innovation, besides individual characteristics of farmer.

Strategy to Build Farmer Capacity towards the Characteristics of Millennial Farmers

Based on the result of descriptive and regression analysis, model was form and the strategy to build farmer capacity towards millennial farmer characteristics was formulated. According to Effendy (2020), there are main characteristics of millennial generation, namely: curious about many things, interested in collaboration, prefer something quick and instant, love to do various works (multitasking), prefer flexible work schedule, think ahead and progressively, critical of social phenomenon around them, gadget-minded or use mobile devices all the time, non-stop 24/7 use of social media, know and grow together with the latest technology, and consider that information technology is basically an opportunity. Therefore, investigating and knowing these characteristics will provide benefit for all stakeholders, particularly decision makers in order to use and empower the existing potential of millennial farmers. In relation to the aspect of farming practices in the field, millennial farmers were found to be successful, in fact they already have market access that guarantees the marketing of product they have produced by support of partnership networks that have been formally and systematically established, hence business sustainability is guaranteed.

Furthermore, the strategy to build farmer capacity towards the characteristics of millennial farmers in chili farming community is possibly done by performing extension to farmers in accordance with indicators of capacity examined in this study. The selection of extension materials should be determined following the result of descriptive analysis according to the lowest value of indicator obtained from chili farming capacity as described in Figure 6.

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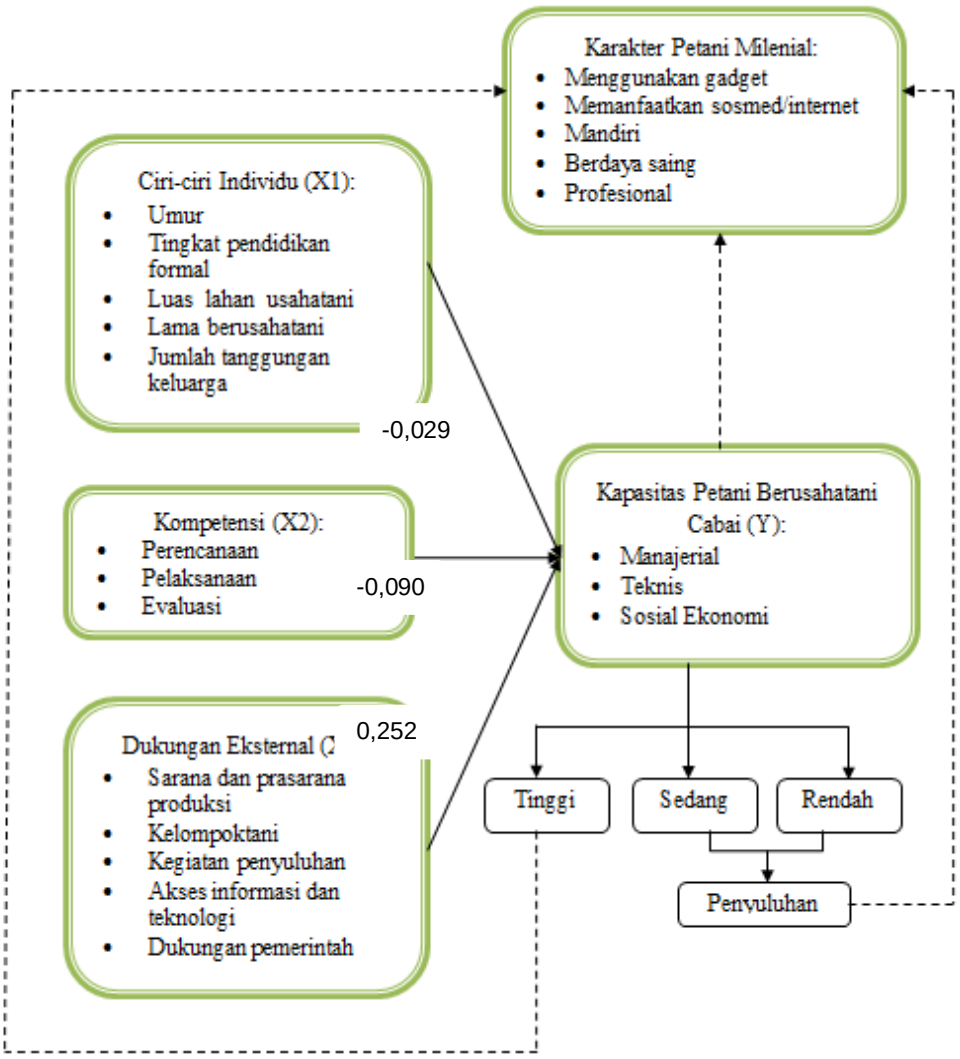

Figure 6. Model of Farmer Capacity Building

IV. CONCLUSION

Based on the result of this study, it is concluded that: (1) Farmer capacity towards millennial farmer characteristics was still below the expectation (belonged to moderate category); generally, respondent in this study was included in the category of millennial (age of 19-40 years old), education level of Elementary School (SD), relatively large farming area (>1.000 m^2), and quite long farming experience of 13-15 years; (2) factors affecting capacity included individual characteristic which is reflected by age and farming experience, while external factor is reflected by the support of facility and infrastructure, and farmer group support; (3) the strategy to build farmer capacity towards millennial farmer characteristics in chili farming community is possibly applied by optimizing the use of available facility and infrastructure and farmer group support.

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