

Female Farmer Group Empowerment by Applying Hydroponic Planting System for Mustard Greens in Cikoneng Sub-District, Ciamis District, Indonesia

Wida Pradiana^{1*}, Suryo Ediyono²

¹ Doctoral Study Program of Development Extension, Health Promotion Major, Sebelas Maret University, Surakarta

² Faculty of Cultural Studies, Sebelas Maret University, Surakarta, Indonesia

*Corresponding Author

Abstract: This study investigates the empowerment of female farmer groups with the application of a hydroponic system in Cikoneng sub-district, Ciamis District. This study aims to describe the application of a hydroponic planting system, analyze the factors that influence the application of a hydroponic planting system, and formulate strategies to improve the application of the hydroponic planting system. The study was carried out for three months (March-June 2021) in three designated villages of Kujang Village, Nasol Village, and Cimari Village. Determination of the sample used the census technique with the criteria that all-female farmers in the female farmer group have farming businesses with a total of 75 people. Data were collected by distributing questionnaires and interviews. The questionnaire contained questions related to variables. The data analysis used was descriptive analysis and multiple linear regression. Based on the results of multiple linear regression analysis, the factors affecting the empowerment of female farmer groups with the application of hydroponic planting systems on mustard greens cover the role of extension workers and the role of female farmer groups. Based on the results of regression and descriptive analysis, the strategy used was to provide counseling in the form of transferring knowledge and persuading female farmer groups to apply hydroponic planting systems.

Keywords: Empowerment, Female Farmer Group, Hydroponics

I. INTRODUCTION

Most of the population's livelihood in Ciamis District is farming so the agricultural sector has a dominant contribution to Regional Gross Domestic Product (GDP) compared to other sectors. This indicates that local governments need to pay more attention to the potential development of the agricultural sector, where the scope includes food crops, fisheries, animal husbandry, and forestry. The total area of this district is 244,369 Ha. with a population of 1,774,032 people. As the New Autonomous Region (DOB), Ciamis District has a growth rate of 0.84 percent per year (Department of Agriculture, Ciamis Strategic Plan). Based on the 2020 program data, the vegetable production of Cikoneng Sub-district experienced an increase in the previous year from 13.52 tons in 2018 to 13.58 tons in 2020 (Cikoneng District Program 2020).

The implementation of food in Indonesia is regulated in Law No. 18 of 2012 which emphasizes the fulfillment of food at the individual level by utilizing natural, human, social, and economic resources, as well as local wisdom so that food security and independence can be realized. The Ministry of Agriculture has initiated various programs to support increased food production and food self-sufficiency as the fulfillment of daily food needs is important. A yard is a plot of land located around the house and if it is used well, it can provide a great advantage, especially to meet daily needs and increase the family's economic income.

The Covid-19 pandemic limits people's outside activities so that people try to do many activities at home to avoid feeling bored from self-isolation. One of the alternative activities is practicing a hydroponic planting system by utilizing a narrow yard. The use of this narrow yard, as an effort to fulfill daily needs, can be useful and eliminate boredom. Hydroponic activities strive as a sustainable food source to increase availability, accessibility, utilization, and income. The land ownership of female farmer groups becomes an idea to produce food as food fulfillment. The idea of applying the hydroponic planting system did not go well due to a lack of information about hydroponics and limited community empowerment in utilizing the yard.

In the context of society, empowerment is the ability of individuals to combine in society and empower the community concerned. Community empowerment is the element enabling society to survive and in a dynamic sense to develop itself and achieve progress. Community empowerment is an effort to increase the dignity of the community from poverty and underdevelopment. In other words, empowerment is an effort to enable and empower the community. One of the efforts to develop and strengthen the community is to increase access to capacity and capability (Effendy 2014).

In line with Hubeis, especially chapter I article 1 of the Law No. 16 concerning SP3K 2006, the agricultural, fishery and forestry extension system, hereinafter referred to as the extension system, is the entire series of capacity development, knowledge, skills, and attitudes of the main actors and

business actors through extension. Meanwhile, Arifin (2011) defines competence as a unique integrated link between knowledge, skills, attitudes and values that are reflected in patterns of thinking and action.

Based on the description above, the formulation of the problem of this study is (1) To what extent does the empowerment of female farmer groups with the application of the hydroponic planting system for mustard greens?, (2) What are the factors affecting the empowerment of female farmer groups with the application of the hydroponics planting system for mustard greens, and (3) How is the strategy of empowering female farmer groups with the application of the hydroponic planting system for mustard greens. The objectives of this stud are to (1) Analyze the extent of empowerment of female farmer groups with the application of the hydroponic planting system for mustard greens, and (2) Analyze the factors affecting the empowerment of female farmer groups with the application of the hydroponics planting system, and (3) Formulate a strategy for empowering female farmer groups through the application of hydroponic planting system for mustard greens (*Brassica juncea* L.).

II. MATERIALS AND METHODS

This study about empowering the female farmer group by applying a hydroponic planting system for mustard greens was conducted from early April to June 2021 in Cikoneng Sub-district, Ciamis District.

Population and Sample

The population of this study was female farmer groups in Cikoneng Sub-district, Ciamis District. Three out of six villages in Cikoneng Sub-district were selected, namely Cimari Village, Kujang Village, and Nasol Village. The detail can be seen in Table 1.

Table 1. Population of Female Farmers Group based on the number of members

No.	Village	Female farmer group	Number of member
1	Cimari	Wargi Saluyu	20
2	Kujang	Strawbery	25
3	Nasol	Mekarsari	30
Total population			75

Source: Primary Data Processed by Researcher, 2021

Sugiyono (2012:73) defines samples as a part of the number and characteristics possessed by the population. The sample taken from the population has to be truly representative. The sample size is the number of samples to be taken from a population.

Arikunto (2012: 104) states that if the population is less than 100 people, then the entire population was taken, but if the population is more than 100 people, then 10-15% or 20-25% of the total population can be taken. As the population of this

study is less than 100, the total population of female farmer groups, namely 75 people was taken. The use of the entire population without having to draw a sample size as a unit of observation is referred to as a census technique.

III. RESULTS AND DISCUSSION

Rural Extension Center (BPP) of Cikoneng Sub-district, Ciamis District covers nine villages. Cikoneng Sub-district is located in the western part of Ciamis District with a distance of about 12 km from the district capital. The area of this sub-district is 3,290.90 Ha consisting of 740.26 Ha of rice fields and 2,559.64 Ha of dry land. The type of soil in this area is known to have an average latosol with a slightly acidic pH. Cikoneng sub-district has territorial boundaries of Sadanaya sub-district in the north, Sindangkasih sub-district in the west, Ciamis sub-district in the east, and Tasikmalaya City in the south. The land area of Cikoneng Sub-district is 4,225.47 Ha, and 774.40 Ha is used for rice fields. The total population of this sub-district is 52,033 consisting of 25,928 males and 26,105 females.

Internal Factor

The characteristics of the respondents by age in Cimari Village, Kujang Village, and Nasol Village are categorized into four as presented in Table 2.

Table 2. Age of Respondents

Age (years old)	Number (people)	Percentage (%)
25-31 (Very productive)	22	29.3%
32-38 (Productive)	32	42.6%
39-45 (Quite productive)	17	22.6%
46-52 (Less productive)	4	5.3%
Total	75	100.00%

Source: Primary Data Processed by Researcher, 2021

Based on Table 2, a total of 22 respondents in Cimari Village, Kujang Village, and Nasol Village are in the age range of 25-31 with a very productive category (29.3%). Then, 32 respondents are in the age range of 32-38 with a productive category (42.6%). Meanwhile, the respondents in the age range of 39 – 45 and 46-52 are 22.6% and 5.3% respectively. The characteristics of respondents in terms of education are presented in Table 3.

Table 3. Education Level

No .	Education Level	Length of education	Number (people)	Percentage
1	University (Very high)	16	0	0
2	Senior high school (High)	12	34	45.3%
3	Junior high school (Medium)	9	17	22.6%
4	Elementary School (Low)	6	24	32.1%
Total			75	100%

Source: Primary Data Processed by Researcher, 2021

Based on Table 3, in terms of education level, a total of 45.3% have a high school education level. Meanwhile, the lowest value is at the junior high school level with a percentage of 22.6%. A total of 32.1% of the respondents have elementary school level. The results of the recapitulation of the length of running farming businesses in Cimari Village, Kujang Village, and Nasol villages are categorized into four as presented in Table 4.

Table 4. Length of Running Farming Businesses

	Length of running farming businesses	Number (people)	Percentage (%)
	15-22 (Very new)	14	18.6%
	23-30 (New)	35	46.6%
	31-38 (Long)	21	28%
	39-45 (Very long)	5	6.6%
	Total	75	100.00%

Source: Primary Data Processed by Researcher, 2021

Table 4 shows that the length of running farming businesses varied. The highest percentage is in a new category with a length of farming about 23-30 years of 35 people (46.6%). Then, for a long category with a length of farming about 31 - 38 years is 21 people (28%). The length of farming is about 15-22 years with a very new category covering 14 people (18.6%). Meanwhile, for a very long category with a length of farming about 39-45 years is 5 people (6.6%). The results of the analysis in terms of the land size in Cimari Village, Kujang Village, and Nasol Village are categorized into four as presented in Table 5.

Table 5. Land Size

No.	Category of land size	Number (people)	Percentage (%)
1	240-880	44	58.6%
2	881-1521	19	25.4%
3	1522-2162	9	12%
4	2163-2800	3	4%
	Total	75	100%

Source: Primary Data Processed by Researcher, 2021

Based on Table 5, 44 (58.6%) out of 75 respondents have a narrow land size with a range of 240-880. 58.6%. The land size in the medium-size category with a range of 881-1521 is owned by 19 respondents (25.4%). Then, 12% of the respondents have a quite large size category with a range of 1522-2162, while 4% of the respondents have a land size of 2163-2800.

External Factor

The results of the study in terms of the role of extension workers are categorized into three, namely high, medium, and low as presented in Table 6.

Table 6. Roles of Extension Workers

No.	Category	Number (people)	Percentage (%)
1	25 – 35 Low	27	36%
2	36 – 46 Medium	39	52%
3	47 – 55 High	9	12%
	Total	75	100%

Source: Primary Data Processed by Researcher, 2021

Based on the table above, the majority of the role of extension workers is in the medium category with a percentage of 52% of 39 respondents. The low category covers 27 respondents with a percentage of 36%, and 9 respondents in the high category with a percentage of 12%. Based on these data, in the medium category, the role of extension workers can be increased by empowering female farmer groups with the application of hydroponic planting systems. In a low category, the extension workers must visit the farmer groups more regularly and conduct empower female farmer groups with the application of the hydroponics planting system. The results of the study in terms of the role of female farmer groups are categorized into three, namely high, medium, and low as presented in Table 7.

Table 7. Roles of Female Farmer Groups

No.	Category	Number (people)	Percentage (%)
1	6 – 11 Low	55	73.3%
2	12 – 16 Medium	9	12%
3	17 – 20 High	11	14.6%
	Total	75	100 %

Source: Primary Data Processed by Researcher, 2021

Based on Table 7, 55 respondents considered that the role of the female farmer group is low with a percentage of 73.3%. Meanwhile, 9 respondents (12%) and 11 respondents (14.6%) considered it medium and high respectively. Based on these results, the role of female farmer groups is considered low in farming activities. The role of female farmer groups in learning classes, cooperation media, and production units is still low as they have not maximized their role and have not conducted meetings for counseling or sharing with all-female farmer group members. The results of the study in terms of facilities and infrastructure are categorized into three, namely high, medium, and low as presented in Table 8.

Table 8. Facilities and Infrastructure

No.	Category	Number (people)	Percentage (%)
1	5 – 8 Low	40	53.3%
2	9 – 12 Medium	27	36%
3	13 – 14 High	8	10.6%
	Total	75	100%

Source: Primary Data Processed by Researcher, 2021

Based on the analysis, the majority of female farmer groups (40 respondents) rated the facilities and infrastructure in a low category with a percentage of 53.3%. Then, 27 respondents rated the facilities and infrastructures in a medium category with a percentage of 36% and 8 respondents rated the facilities and infrastructure in a high category with a percentage of 10.6%. This shows that the facilities and infrastructure are considered in the low category because of lacking and too late to reach the female farmer groups.

Empowerment of Female Farmers Groups by Applying the Hydroponic Planting System for Mustard Greens

The results of the study in terms of empowerment are categorized into three, namely high, medium, and low as presented in Table 9.

Table 9. Empowerment of Female Farmers Groups by Applying the Hydroponic Planting Systems for Mustard Greens (*Brassica Juncea L.*)

No.	Category	Number (people)	Percentage (%)
1	25-34 Low	8	10.6%
2	35-44 Medium	56	74.6%
3	45-53 High	11	14.6%
	Total	75	100

Source: Primary Data Processed by Researcher, 2021

Based on the table above, the majority of female farmer group empowerment is in the medium category with a percentage of 74.6% with 56 respondents. The detail results of the empowerment of female farmer groups through the application of the hydroponic planting system for mustard greens in Cikoneng Sub-district are presented in Table 10.

Table 10. Results of Analysis of Empowerment Variable

No	Indicators	Category	Number (people)	Percentage (%)
1	Knowledge	6 – 12 Low	47	62.6%
		13 – 19 Medium	15	20%
		20 – 24 High	13	17.3%
		Total	75	100%
2	Attitude	5 - 10 Low	48	64%
		11 – 16 Medium	22	29.3%
		17 – 20 High	5	6.6%
		Total	75	100%
3	Skills	3 – 6 Low	7	9.3%
		7 – 10 Medium	36	48%
		11 – 12 High	32	42.6%
		Total	75	100%

Source: Primary Data Processed by Researcher, 2021

Effects of Internal and External Factors on the Empowerment of Female Farmer Groups by Applying the Hydroponic Planting System for Mustard Greens

Table 11. Multiple Linear Regression Analysis

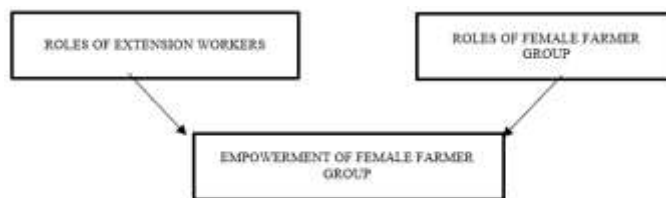
No	Variable	Coefficient value	Significant Probability	Notes
1	R2	0,886		
2	Constant	5,691	0,056	Not significant
3	Age	0,378	0,329	Not significant
4	Formal education	0,469	0,241	Not significant
5	Length of running farming businesses	0,026	0,948	Not significant
6	Land size	0,174	0,647	Not significant
	Role of extension workers	0,240	0,000	Significant
8	Role of female farmer group	1,623	0,000	Significant
9	Facilities and infrastructure	-0,116	0,630	Not significant

a. Dependent Variable: Empowerment

The analysis of the value of the influence of internal and external factors on empowering female farmer groups by applying hydroponic planting system for mustard greens used the following equation $Y = (5.691) + (0.240) X2.1 + (1.623) X2.2 + 56%$ for the role of extension workers and the role of female farmer groups. The percentage value of the influence of internal and external factors used with a coefficient of determination (R square) based on the results of multiple linear regression analysis of 0.886. This means that 88% of female farmer group empowerment is influenced by independent variables and dependent variables, while 12% percent is influenced by factors outside the study.

Empowerment strategy of female farmer groups by applying hydroponic planting system for mustard greens (Brassica juncea L.).

Empowerment strategy of female farmer groups by applying hydroponic planting system for mustard greens cover knowledge, attitudes and skills. The results show that the empowerment strategy is in the medium category. The strategy used to address the existing problems is by optimizing and maintaining factors that have a significant relationship with the empowerment of female farmer groups. The empowerment strategy of female farmer groups can be seen in the following figure.



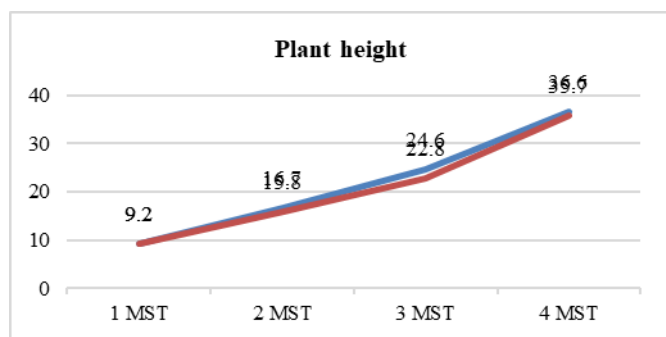
Pilot Plot

Figure 3. Plant height

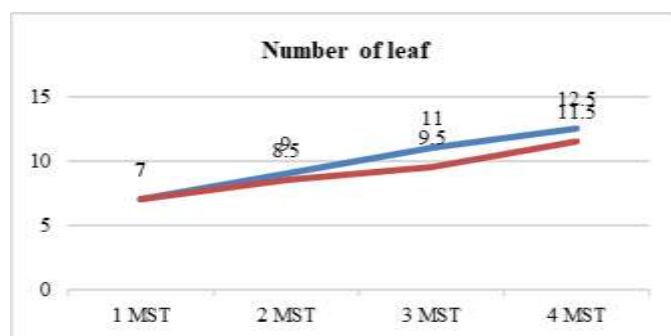


Figure 4. Number of leaf

Figure 3 of plant height show plants using and not using a hydroponic planting system. Average height increases only along with the increasing age. At the end of the study (4 MST), the height of the mustard greens was between 9.2 to 36.7 cm. Based on Figure 4, the observations in the pilot plot on the hydroponic planting system activity showed the effect at week 4 with 12.5 leaves, while plants without using the hydroponic planting system had 11.5 leaves. The observation was carried out for 4 weeks.

V. CONCLUSION

Based on the results of the study on empowering female farmer groups by applying a hydroponic planting system for mustard greens in Cikoneng Sub-district, Ciamis District, it can be concluded that the empowerment is in a low category based on the following indicators, namely attitude (64%), knowledge (62.6%), and skill (48%). In terms of the factors affecting variable X on Y, the role of extension workers and the role of farmer groups significantly affect the empowerment of female farmer groups through the application of a hydroponic planting system for mustard greens. In terms of empowerment strategy, the results of multiple linear regression analysis and descriptive analysis are used for designing extension activities related to attitudes and knowledge about the application of hydroponic planting systems.

Based on the results of the study, the researcher suggests the female farmer group leader encourage the members to be active in group activities. Members of female farmer groups

need to play an active role in counseling and applying the technology that has been provided. Extension workers and other related parties have to be able to take a persuasive approach to female farmer groups to apply the hydroponic planting system for mustard greens.

ACKNOWLEDGEMENT

The researcher highly appreciates all Rural Extension Workers, Female Farmer Groups, and the Head of Gapoktan and Poktan for their participation and supports in this study.

REFERENCES

- [1] [BPP] Balai Penyuluhan Pertanian. 2020. Programe Kecamatan Cikoneng Tahun 2020
- [2] Aida Vitayala S. Hubeis. 2010. Pemberdayaan Perempuan dari Masa ke Masa. Bogor: IPB Press.
- [3] Dimas, B. 2012. Analisis motivasi dan kemampuan kerja terhadap kinerja Pegawai Negeri Sipil di Badan Kepegawaian Daerah Kabupaten Demak". *Journal of Public Policy and Management Review*, 1(2), 31-40.
- [4] Effendy, L. 2014. Bahan Ajar Metode Pengkajian Penyuluhan Bogor : Sekolah Tinggi Penyuluhan Pertanian Bogor.
- [5] Erawan, D., Yani, W. O., & Bahrin, A. 2013. Pertumbuhan dan hasil tanaman sawi (*Brassica juncea* L.) pada berbagai dosis pupuk urea. *Jurnal Agroteknos*, 3(1), 19-25.
- [6] Erliadi. 2015. Faktor-Faktor Yang Mempengaruhi Minat Petani Menggunakan Benih Varietas Unggul Pada Usahatani Padi Sawah (*Oryza sativa*, L) Di Kecamatan Manyak Payed Kabupaten Aceh Tamiang. *AGRISAMUDRA, Jurnal Penelitian* Vol.2 No.1 Januari –Juni 2015.
- [7] Fahrudin, F. 2009. Budidaya caisim (*Brassica juncea* L.) menggunakan ekstrak teh dan pupuk kascing.
- [8] Fitriyanti, N., & Sadono, D. 2013. Partisipasi Masyarakat dalam Program Nasional Pemberdayaan Masyarakat-Mandiri di Desa Kotabatu, Kecamatan Ciomas, Kabupaten Bogor. *Jurnal Penyuluhan*, 9(1).
- [9] Hanafie, R. 2010. Pengantar ekonomi pertanian. Penerbit Andi.
- [10] Herawati, T. 2014. Pengaruh Sistem Pengendalian Intern Terhadap Kualitas Laporan Keuangan (Survei Pada Organisasi Perangkat Daerah Pemda Cianjur). *STAR- Study & Accounting Research*, 11(1), 1-14.
- [11] Herwibowo, K., & Budiana, N. S. 2014. Hidroponik Sayuran. Penebar Swadaya Grup.
- [12] Hidayat, A. T., & Fitria, E. F. 2018. Pengaruh Capital Intensity, Inventory Intensity, Profitabilitas dan Leverage Terhadap Agresivitas Pajak. *Eksis: Jurnal Riset Ekonomi dan Bisnis*, 13(2), 157-168.
- [13] HOBSSI, F., Sunaryo, H., & ABS, M. K. 2019. Pengaruh motivasi dan kompensasi terhadap kinerja karyawan ud. Cjdw meteseh kota semarang. *Jurnal Ilmiah Riset Manajemen*, 8(17).
- [14] Huraera Abu, Pengorganisasian & Pengembangan Masyarakat: Model & Strategi. Jakarta: Penerbit Elex Media Komputindo Kompas Gramedia. Jakarta: PT. Rineka Cipta. Keduabelas.
- [15] Istiqomah, S. 2006. Menanam hidroponik. Ganeca Exact.
- [16] Juwita, R., Triana, A. N., & Purnomo, R. H. 2017. Aplikasi Irigasi Tetes (Drip Irrigation) Dengan Berbagai Media Tanam Pada Tanaman Pakcoy (*Brassica rapa* L.) (Doctoral dissertation, Sriwijaya University).
- [17] Karimah, F. 2014. Pengelolaan Alokasi Dana Desa Dalam Pemberdayaan Masyarakat (Studi Pada Desa Deket Kulon, Kecamatan Deket, Kabupaten Lamongan). *Jurnal Administrasi Publik*, 2(4), 597-602.
- [18] Karwan . A, Salikin. 2003. Sistem Pertanian Berkelanjutan. Yogyakarta: Kanisius
- [19] Kasumbogo, Untung. 1997. Peranan Pertanian Organik Dalam Pembangunan yang Berwawasan Lingkungan.

- [20] Laksono, B. A. 2018. The Community Empowerment Through Social and Educational Institutions. *Jurnal Pendidikan Humaniora*, 6(3), 115-122.
- [21] Mafruhah, I., Mulyani, N. S., Istiqomah, N., & Ismoyowati, D. 2019. Development of ecotourism based on community empowerment (A case study of Kebumen regency). *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi dan Pembangunan*, 19(2), 196-206.
- [22] Mardikanto, T. 2009. *Sistem Penyuluhan Pertanian*. Surakarta : Universitas Negeri Surakarta Press.
- [23] Muslim, A. 2016. *Economic Community Empowerment Through Tourist Village Development*. Bandung Islamic University.
- [24] Noerhermaya, A N. 2018. *Pemberdayaan Anggota Kelompok Wanita Tani dalam Optimalisasi Lahan Pekarangan melalui Pengembangan Tanamn Cabai Merah di Kecamatan Pangandaran Kabupaten Pangandaran Provinsi Jawa Barat*. (Karya Ilmiah Penugasan Akhir). Bogor : Sekolah Tinggi Penyuluhan Pertanian Bogor.
- [25] Parawansa, Khafifah Indar. 2019, *Mengukur Paradigma Menembus Tradisi. Pembangunan Berbasis Kerakyatan* (Bandung: Humaniora, 2011) hal 66-67. Penting dari Negara Lain (Artikel dalam Buku Gagasan, Pikiran dan Harapan Alumnus Fak Pertanian Unhas Terhadap Pertanian).
- [26] Peraturan Menteri Pertanian No. 52 tahun 2009 tentang Metode Penyuluhan Pertanian.
- [27] Peraturan Menteri Pertanian No. 67 tahun 2016 tentang Kelembagaan Kelompok Tani.
- [28] Peraturan Menteri Pertanian No. 03 tahun 2018 tentang Pedoman Penyelenggaraan Penyuluhan Pertanian
- [29] Rachmawatie, D., Rustiadi, E., Fauzi, A., & Juanda, B. 2020. Empowerment of rural community through the development of renewable electricity. *Jurnal Perspektif Pembiayaan dan Pembangunan Daerah*, 8(2), 139-154.
- [30] Rani, E., Effendy, L., & Krisnawati, E. 2020. *Pemberdayaan Kelompok Wanita Tani (Kwt) Mealui Pemanfaatan Limbah Sisa Sayuran sebagai Pupuk Organik Cair pada Budidaya Pakcoy di Kacamatan Samarang*. *Jurnal Inovasi Penelitian*, 1(3), 445-454.
- [31] Sadono, D., Sumardjo, S., Gani, D. S., & Amanah, S. 2017. *Farmer Empowerment in The Management of Rice Farming in Two Districts in West Java*. *Journal of Rural Indonesia*, 2(1).
- [32] Sahin, I., & Thompson, A. 2006. Using Rogers' theory to interpret instructional computer use by COE faculty. *Journal of Research on Technology in Education*, 39(1), 81-104.
- [33] Said, Ahmad. 2007. *Budi Daya Mentimun secara Hidroponik*. Ganeca Exact.
- [34] Salikin, K. A. 2003. *Sistem pertanian berkelanjutan*. Kanisius
- [35] Sumaryadi. 2005. *Faktor-faktor yang mempengaruhi pemberdayaan masyarakat*
- [36] Susilawati, D., & Rachmawati, P. 2020. *Pemberdayaan Kelompok Wanita Tani (KWT): Pengolahan Jagung di Dusun Karangnongko Desa Ngloro Kecamatan Saptosari Kabupaten Gunung Kidul*. *JPPM (Jurnal Pengabdian dan Pemberdayaan Masyarakat)*, 4(1), 157-162.
- [37] Sutriani, S., Fitriana, M., & Ammar, M. 2020. *Pengaruh Komposisi Pupuk Kandang Ayam Dan Arang Sekam Padi Dengan Tanah Terhadap Pertumbuhan Dan Hasil Tanaman Caisim (Brassica juncea L.)* (Doctoral dissertation, Sriwijaya University).
- [38] Syafaruddin. 2012. *Pendidikan dan pemberdayaan masyarakat*, Medan.
- [39] Syarif, A. 2018. *Pemberdayaan perempuan menghadapi modernisasi pertanian melalui kelompok wanita tani (KWT) pada usahatani sayuran di Kecamatan Bissapu Kabupaten Bantaeng*. *Ziraa'ah Majalah Ilmiah Pertanian*, 43(1), 77-84
- [40] Untung, O. 2000. *Hidroponik Sayuran Sistem NFT (Nutrient Film Technique)*. Jakarta: Penebar Swadaya.
- [41] UU RI. *Undang-Undang Republik Indonesia Nomor 16 Tahun 2006. Sistem Penyuluhan Pertanian, Perikanan dan Kehutanan*. Jakarta : Kementerian Pertanian.
- [42] UU RI. *Undang-Undang Republik Indonesia Nomor 18 tahun 2012 yang menekankan adanya pemenuhan pangan tingkat individu dengan memanfaatkan sumberdaya alam, manusia, sosial, ekonomi, kearifan lokal sehingga ketahanan dan kemandirian pangan dapat tercapai*
- [43] UU RI. *Undang-Undang Republik Indonesia Nomor 19 Tahun 2013. Perlindungan dan Pemberdayaan Petani*. Jakarta : Kementerian Pertanian.
- [44] Widjajanti, K. 2011. *Model Pemberdayaan Masyarakat*. *Jurnal Ekonomi Pembangunan* Vol. 12 No. 1. Semarang : Universitas Semarang.
- [45] Yani, A. R. *Tingkat Motivasi Petani Dalam Berusahatani Jamur Merang (Volvariella Volvaceae) Pada Kelompok Tani Kaola Mandiri Kabupaten Jember*.