e-ISSN 2774-6348
p-ISSN 2774-6011

Journal of Community Practice and Social Welfare

JaCiPS

Volume 01 ● Issue 02 ● 2021

Articles

LEMBAGA PENELITIAN & PENGABDIAN KEPADA MASYARAKAT ★ LPPM ★
UNIVERSITAS MA CHUNG

jacips.machung.ac.id

e-ISSN 2774-6348
p-ISSN 2774-6011

JOURNAL OF COMMUNITY PRACTICE AND SOCIAL WELFARE (JaCiPS)

Honorable Mentions of Reviewers (2020-2022)

Department of Business Management, Ma Chung University, Indonesia	Anna Triwijayati
Department of Information Systems, Ma Chung University, Indonesia	Yudhi Kurniawan
Department of Business Management, Ma Chung University, Indonesia	Stefanus Yufra Menahen Taneo
Department of Chemistry, Ma Chung University, Indonesia	Rokiy Alfanaar
Department of Informatics Engineering, National Institute of Technology (ITN), Indonesia	Joseph Dedy Irawan
Department of Informatics Engineering, Kanjuruhan University, Indonesia	Anggri Sartika Wiguna
Department of English Literature, Ma Chung University, Indonesia	Lilis Lestari Wilujeng
School of Electrical Engineering, Telkom University, Indonesia	Erwin Susanto
Department of Mechanical Engineering, Hasanuddin University, Makassar, Indonesia	Azwar Hayat

e-ISSN 2774-6348
p-ISSN 2774-6011

JOURNAL OF COMMUNITY PRACTICE AND SOCIAL WELFARE (JaCiPS)

Volume 1 Number 2 - 2021

Contents

ARTICLES

Aim and Scope

The Journal of Community Practice and Social Welfare (JaCiPS) is approaching human welfare through complex society and community. Apply the unlimited knowledge and interdisciplinary, including:

1. Social sciences for community services
2. Engineering for community services and human welfare
3. Educational technology for community services
4. Health and pharmacy for community services
5. Art sciences for community services
6. Theory and model developments for community services

JaCiPS is periodicals scientific publishers managed by research and community service department (*Lembaga Penelitian dan Pengabdian Kepada Masyarakat* - LPPM) of Ma Chung University Indonesia. Accepts the manuscripts and articles surroundings the field of applied research towards society from various academic circles and researchers both nationally and internationally. Each contributed author shall be responsible for their original writing. Each published article contains a unique **Digital Object Identifier** (DOI) number with prefix doi: 10.33479/jacips.

Research and Community Services Department

Research and community services department (*Lembaga Penelitian dan Pengabdian Kepada Masyarakat* - LPPM) of Ma Chung University Indonesia. Our aims are to developing and improving the quality of research and community services in the field of study-of-living-natural-resources, designing, coordinating, monitoring, and assessing the implementation of research and community service activities.

LPPM Ma Chung
RnD Building, Ground Floor,
Ma Chung University
Jalan Villa Puncak Tidar N-1
Malang, Indonesia 65151

Phone: +62-341-550171 Ext. 4010
Email: jacips@machung.ac.id
lppm@machung.ac.id

https://jacips.machung.ac.id/index.php/home/

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 1-15, 2021
ISSN: 2774-6011 print
2774-6348 online

Community Empowerment Through Homegrown Medicinal Plants and The "*Wedang Uwuh*" Herbal Beverage Cultivation in Seketi Hamlet

Juliani Pudjowati, Thariq Abdurrahman*, Enjelita Putri Pratiwi, Rizky Nugraha Baqi, Anggun Kumala Syafitri

Fakultas Ekonomi dan Bisnis, Universitas Bhayangkara Surabaya, Jl. Ahmad Yani No. 114 Ketintang, Surabaya, Indonesia, 60231

Correspondence: Thariq Abdurrahman (kknubhara2020.20@gmail.com)
Received: *10 January 2021* – Revised: *18 April 2021* - Accepted: *24 April 2021*

Abstract. Rural community empowerment is an effort to develop independence and community welfare through the improvement of knowledge, attitudes, skills, behaviour, abilities, awareness, and resource utilization. This is carried out by establishing policies, programs, activities and assisting with the problems related to the priority needs of the community to increase community activities through the cultivation of homegrown medicinal plants. The homegrown medicinal plants (TOGA) are traditional medicinal plants. These medicinal plants are used for making *Wedang Uwuh*. The ingredients consist of various types of spices namely: ginger, cloves, nutmeg, lemongrass, cardamom, cinnamon, sappanwood, and rosella. The method of implementation used is through the diffusion of knowledge and direct practice. These activities were carried out for the residents of Seketi Hamlet. The results of the activities that have been carried out in Seketi Hamlet are as follows: the community gets insight into TOGA plants; people acquire skills in how to process TOGA into *Wedang Uwuh* herbal beverage which can help increase endurance (immunomodulators) to protect against Covid-19 pandemic; adding or increasing community activities through the use of house yards as TOGA growing media. Therefore, it is necessary for the Head of Seketi Hamlet to consider doing several things, namely the provision of advanced programs via entrepreneurship training to produce superior products from TOGA yields, and community cooperation in the continuous care of the "Seketi Hamlet Health Garden" for long term benefits.

Keywords: Community empowerment, TOGA, herbal medicine, Wedang Uwuh

Citation Format: Pudjowati, J. Abdurrahman, T., Pratiwi, E.P., Baqi, R.N., & Syafitri, A.K. (2021). Community Empowerment through Toga and The "Wedang Uwuh" Herbal Beverage Cultivation in Seketi Hamlet. *Journal of Community Practice and Social Welfare*, 1(2), 1-15.

INTRODUCTION

Seketi Hamlet is located in Jatidukuh Hamlet, Gondang District, Mojokerto Regency, at a distance of approximately 30 km from Mojokerto City. The Hamlet is divided into four neighbourhoods from the north to the south. The population of this Hamlet is sufficiently solid with 221 registered family cards. The majority of Seketi Hamlet residents works as farmers, ranchers, and farm labourers. The Hamlet is located in the highlands where the soil is fertile. Lands within the vicinity of Seketi is suitable for various types of plants such as rice, sugar cane, corn, cassava, and various homegrown medicinal plants (TOGA). Because the majority of Seketi residents are farmers, they have developed a close bond and deep social connection with each other. Hence, they generally embrace a familial culture. (Damsar and Indrayani, 2016).

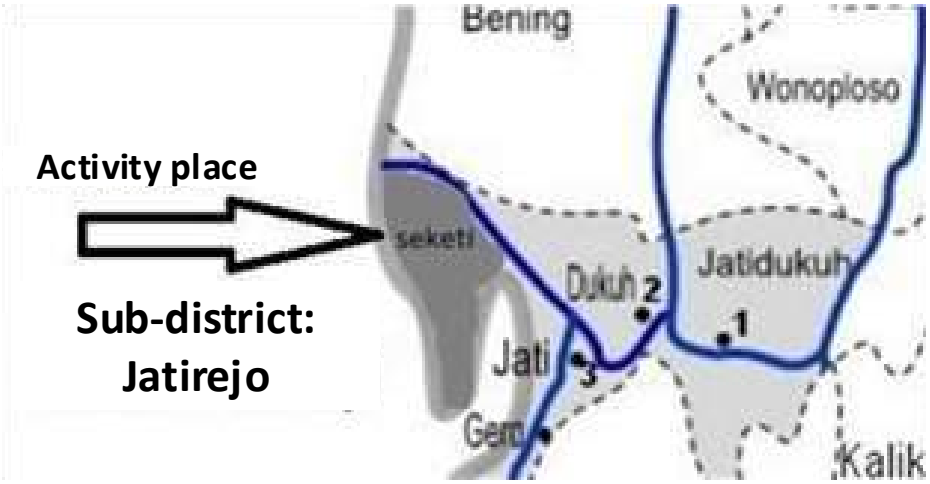

Figure 1. Geographical location of Seketi Hamlet

Hamlet Community Empowerment is an effort to develop the independence and welfare of rural communities by improving knowledge, character, skills, behaviour, abilities, awareness, and resource utilization through the establishment of policies, programs, activities and assisting with the problems related to the priority needs of the community (Damanik, 2019). The establishment of community empowerment in TOGA management is an effort to increase knowledge relating to the utilization and processing of TOGA. Harjono (2017) states that stems, leaves, seeds and roots are plants parts that are useful for medicinal purposes. In addition, Patola (2018) and Kusuma (2016) argues that TOGA has other benefits apart from being a medicine namely; as nutritional supplements, ingredients in spice cooking or seasonings, and as aesthetic enhancements.

ISSN: 2774-6011 print
2774-6348 online

Based on a handbill Numbered: HK.02.02./IV.2243/2020, concerning the use of traditional remedies for health maintenance, disease prevention, and health care, the use of traditional medicinal ingredients during a public health emergency and/or The Coronavirus Disease (Covid-19) pandemic, processed TOGA is designated as herbal beverages that can increase immunity (immunomodulators) (Ministry of Health, 2020).

The use of medicinal plants in Indonesia has lasted for thousands last year. In the mid-17th century, a botanist, Jacobus Rontius (1592–1631), announced the benefits of herbs. This is written in a book titled *De Indiae Untriusquere Naturali* et Medica. According to Widaryanto (2018), *simplicia* medicinal plant parts are divided into eight groups, namely herbal simplicia, roots, leaves, flowers, fruit, seeds, rhizomes, and barks. Several types of simplicias, such as seed, fruit, and bark simplicias can be used for making traditional beverages such as *Wedang Uwuh*.

Quoting from Tribunnews, *Wedang Uwuh* is a type of herbal beverage with many healthy properties. This is because the ingredients consist of various types of medicinal plants in the family. *Wedang Uwuh* is useful for treating ailments such as coughing, colds, flatulence, aches and pains, and as a general refreshment.

Wedang Uwuh originates from Yogyakarta, Imogiri District, Bantul. In Javanese, wedang translates to beverage, while uwuh translates to waste. Waste beverage does not mean waste-based beverages, but drinks that consist of various types of medicinal plants, namely ginger, sappanwood, cloves, cinnamon, nutmeg, lemongrass leaves, cardamom, rock sugar, and rosella.

METHOD OF IMPLEMENTATION

In order to achieve the expected results, this activity is carried out through community empowerment, diffusion of knowledge, and hands-on practice. The implementation method and Student Effective Working Hours (JKEM) are the accumulation of the amount of program hours implemented by students participating in Community Service Program (KKN). The implementation of JKEM was carried out by Group 20 of Thematic KKN students for 20 hours. The details are presented in Table 1 as follows.

Table 1. Method of implementation, activity, and JKEM

No	Method	Activity	JKEM
1	Knowledge Diffusion	Organizing socialization through community empowerment programs regarding the planting and use of TOGA	1x60 minutes
		Organizing socialization regarding the making of *Wedang Uwuh* herbal drink	1x60 minutes
2	Practice	Construction of Seketi Hamlet Health Garden.	17x60 minutes
		Organization of "*Wedang Uwuh*" herbal beverage production training.	1x60 minutes

Activity participants

Participants of this activity mostly consisted of Seketi Hamlet residents who collaborated and took part in the activities of planting media construction and TOGA planting. The main targets of participation for these activities are youth organizations and the average Seketi residents. The main targets of activity participation for the socialization of the benefits of TOGA and the production of *Wedang Uwuh* herbal beverage are housewives and the elderly of Seketi Hamlet.

Technical implementation of activities

The first activity carried out was the construction of planting media and methods of TOGA planting. Materials and tools used in these activities are as follows:

Tools:

1) Long bamboos 60cm (25 pcs)
2) Large decorative rocks (2 pack)
3) Small decorative rocks (2 pack)
4) Hoe and trowel
5) Bendrat wires (rebar wire)
6) Pallet wood fence 2.5m (2 stalks) and 5m (1 stalk)
7) Swab wood 5cm x 7cm thickness with 1.8m tall (2 stalks)
8) Swab wood 5cm x 7cm thickness with 1m tall (5 stalks)

ISSN: 2774-6011 print
2774-6348 online

9) Crowbar
10) Concrete nails 2“ (10 pcs)
11) Wood nails 3” (15 pcs)
12) Name plank “Seketi Hamlet Health Garden” 80cm x 110cm (2 pcs)
13) Name plank for plants (9 pcs)
14) Black paint spray cans (2 pcs)
15) Manure (10 kg)
16) Rice husk (2 kg)
17) Sticker for bane plank “Seketi Hamlet Health Garden”
18) Plant wiring 1m x 15m

Materials for homegrown medicinal plants (TOGA):

1) Green binahong (Heartleaf maderavine madevine)
2) Red binahong
3) Ginseng
4) Galangal
5) Fragrant pandan
6) Roselle flower
7) Green lemongrass
8) Red lemongrass
9) Green betel
10) Curcuma
11) Cinnamon

The methods of TOGA planting and making planting media (Figure 2) is as follows:

1) First, clean and measure the area of any potential land.
2) Determine planting area according to the existing plan, then install TOGA fences in the predetermined area.
3) Loosen the soil around the area for planting media.
4) Remove the plants from the poly bags and transfer it into the prepared soil.
5) Mix the fertilizer and husks with the soil to create the planting medium.
6) Install name planks as markers for plant types.
7) Next step is to decorate the plants with decorative rocks.
8) Lastly, install previously prepared name plank for “Seketi Hamlet Health Garden.”

ISSN: 2774-6011 print
2774-6348 online
Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.1-15, 2021

Figure 2. Design sketch for TOGA planting location in Seketi Hamlet health garden

Location for the TOGA planting plan of Seketi Hamlet Health Garden was carried out in Seketi Hamlet, to be precise, behind a Waste Bank. The plan shows that there are eleven types of TOGA grown in Seketi Hamlet, namely: ginseng, roselle, cinnamon, green lemongrass, red lemongrass, green betel, galangal, ginger, pandan, red binahong, and green binahong. The second activity is the socialization of the benefits of TOGA and the production of *Wedang Uwuh* herbal beverage. The materials and equipment used in this activity are as follows:

Materials:

1) Dried clove
2) Dried nutmeg leaves
3) Dried lemongrass leaves
4) Rock sugar
5) Ginger
6) Dried cardamom
7) Dried cinnamon
8) Sappanwood
9) Dried roselle

ISSN: 2774-6011 print
2774-6348 online

Tools:

1) Cup
2) Flask
3) Plastic gloves
4) Plastic *Ziplock*
5) Plastic cup

How to make and serve *Wedang Uwuh* herbal drink (Figure 7):

1) Dry all ingredients beforehand.
2) Crush the ginger and put in into a cup.
3) Put other ingredients into a glass and fill with warm water.
4) Close the cup and leave it for three minutes.
5) The beverage is ready to serve.

RESULT AND DISCUSSION

Community service activities were carried out in Seketi Hamlet, Jatidukuh Village, Gondang District, Mojokerto Regency. These activities lasted for nine days, from 14th of November to 12th of December 2020. The activities were held at the end of every week, namely Saturdays and Sundays. The main activities of the service were community empowerment through the socialization of healthy lifestyles in the era of Covid-19 pandemic.

A. Plant types

According to the results from a survey conducted in Seketi Hamlet, TOGA planting had not yet been implemented in the hamlet. The types of plants grown by the group are listed in Table 2.

Table 2. Types of homegrown medicinal plants in Seketi Hamlet

No	Plant Types	Amount	Efficacy
1.	Green Binahong	3	Lowers blood sugar to optimal levels and keeps blood sugar levels stable in people with Diabetes Mellitus.
2.	Red Binahong	3	a) Treats burn injuries and ulcers. b) Great for heart health and prevents cancer. c) Restores stamina and prevents diabetes. d) Treats gouts and anemia. Increases Appetite and Prevents Aging.
3.	Ginseng	3	a) Reduces inflammation. b) Relieves stress. c) Boosts the immune system. d) Prevents premature ejaculation. e) Prevents aging.
4.	Galangal	3	a) Alleviates joint pain. b) Increases male fertility. c) Reduces blood sugar levels and cholesterol. d) Treats respiratory problems.
5.	Fragrant pandan	3	a) Relieves fever. People with fever often prefers to drink warm beverages. b) Reduces pain. c) Relieves stomach cramps. d) Detoxifies the body. e) Helps overcome Insomnia. f) Increases appetite. g) Relieves rheumatic pain.
6.	Rosella	3	impedes the absorption of saturated fatty acids and lowers triglycerides levels and bad cholesterol (LDL) in the body.
7.	Green Lemongrass	3	a) Source of antioxidant. b) Detoxifies the body. c) Reduces risk of cancer. d) Keeps digestive system healthy. e) Helps reduce weight. f) Helps reduce enxiety.
8.	Red Lemongrass	3	a) Prevents cancer. b) Herbal medicine. c) Medicine for indigestion. d) Detoxifies.

ISSN: 2774-6011 print
2774-6348 online

No	Plant Types	Amount	Efficacy
9.	Green Betel	3	Relieves inflammation in the throat.
10.	Curcuma	3	Stimulates the production of bile in the gall bladder, thereby helping improve digestive function. By consuming it regularly, various digestive problems can be resolved including bloating, gas problems and dyspepsia.
11.	Cinnamon	3	a) Prevents blood clots, reduces blood sugar levels, and lowers the risk of heart disease. b) Improves brain function, improves digestion, and protects against cancer.

Table 2 shows, that there are eleven types of plants that can be planted in the Seketi Hamlet area, namely: green binahong, red binahong, ginseng, galangal, fragrant pandan, Roselle, green lemongrass, red lemongrass, green betel, ginger and cinnamon. There are three types of plants for each arable media or land (Mindarta and Bebet, 2015).

B. Delivery of material

This activity was carried out by community service group 20 in Seketi Hamlet, Jatidukuh Village, Gondang District, Mojokerto Regency. The material is delivered through socialization. Socialization was carried out through the distribution of drafts containing text and pictures (picture 5). Presentation of material on the benefits of planting TOGA for the production of herbal beverages was given during the socialization. The target demographic of the activity is the Seketi Hamlet residents. During the activity, the community service group explained the benefits of TOGA as a herbal beverage (*Wedang Uwuh*) for medical treatments. This activity is expected to be a guide and source of information for the Seketi community, in the hope that *Wedang Uwuh* can be applied as a general medicine to treat various diseases.

To support the socialization process, implementers distributed questionnaires. The questionnaires were conducted before and after the presentation of the material. Questionnaires given after material presentation is an evaluation of the understanding and interest of the Seketi community in the use of garden plants for treatment. Evaluation is also carried out after material presentation to determine the amount of public understanding and

interest in the use of garden plants for treatment. The questions asked in the questionnaire as well as the answers given by residents of Seketi Hamlet are shown in Table 3.

Table 3. Average results of questionnaire for residents of Seketi Hamlet, Jatidukuh Village, Gondang District, Mojokerto Regency

No	Questions	Answers
1	Are you aware of the definition of TOGA?	Some residents of Seketi Hamlet have knowledge of homegrown medicinal plants, but there are also many residents who do not own or plant them.
2	Have TOGA ever been implemented in Seketi Hamlet?	Joint planting of homegrown medicinal plants have never been carried out in Seketi Village.
3	In your opinion is it feasible for all residents of Seketi Village to own TOGA?	Very feasible considering the benefits and properties of homemade medicinal plants can also be useful for everyday life and can used to treat ailments.
4	Are you familiar with *Wedang Uwuh* herbal beverage?	A number or residents are not familiar with *Wedang Uwuh* herbal beverage.
5	According to you, is sustainable production and selling of *Wedang Uwuh* feasible?	Very feasible for sustainable production and can add into the resident's skillset.
6	If it is to be marketed, how much do you think *Wedang Uwuh* should be priced per sachet?	*Wedang Uwuh* price range per sachet should be around IDR 3,000 - IDR 4,000, if Ready to drink can be sold within the price range of IDR 5,000 - IDR 7,000.
7	According to you, do you think *Wedang Uwuh* has economic value for the community itself?	*Wedang Uwuh* herbal beverage can be of economic value to the residents of Seketi Hamlet due to the cheap price of the beverage and providing various health benefits.
8	If it has economic value and you agree to the production of *Wedang Uwuh* in Seketi Hamlet, what are your reason?	Mass production can develop SMSE and increase the income of Seketi Hamlet residents.

C. Utilization of TOGA for herbal medicine "*Wedang Uwuh*"

Many plants can be used by the people of Seketi Hamlet to improve immunity during the Covid-19 pandemic (Widyanata et al, 2020). Understanding and public awareness of the types of plants that can be used for daily treatment through herbal drinks, namely *Wedang Uwuh*, are also visible. Medicinal plants are plants that are commonly used as medicine by the community. Once material presentation is over, the people of Seketi Hamlet will gain knowledge and understanding of TOGA.

ISSN: 2774-6011 print
2774-6348 online

The benefits of TOGA for medical treatment have already been widely known by the Seketi community, both before and after the presentation of material during thematic community service activities. the public are mostly familiar with the various benefits of homemade medicinal plants, among others, how ginger can overcome gout, lemongrass leaves are rich in antioxidants, Cinnamon contains anti-inflammatory compounds to reduce risk of cardiovascular diseases, Nutmeg leaves can clean toxins in the liver and kidneys, cardamom and ginger combination can boost the immune system, and rock sugar and ginger combination can relieve coughs and colds (Parvez, 2016).

Figure 3. TOGA planting process

The series of thematic community service activities began with the creation of the Seketi Hamlet Health Garden. Furthermore, the implementer empowers the community to take part in activities and participate in utilizing the resources in their environment namely, the manufacture of TOGA planting media. It aims to provide knowledge and skills on how to plant, make and care for TOGA. In addition, this activity is also intended for land utilisation as a growing medium for TOGA which can provide additional income.

Figure 4. Handover of TOGA to Karang Taruna (youth neighbourhood organization) of Seketi Hamlet

ISSN: 2774-6011 print
2774-6348 online
Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.1-15, 2021

Figure 5. Socialisation of the benefits of TOGA.

Figure 6. Socialisation of the benefits of *Wedang Uwuh.*

After the community service group (Figure 4) carried out a work program of fence making and TOGA planting in the Seketi Hamlet Health Garden, the implementer hands the garden over to the chairperson of the youth organization (Karang Taruna). The implementer hands over the garden as a symbolic gesture of the transfer of its ownership to the Seketi community. This was done in the hopes that the community can maintain and care for the health garden. Eventually, the community were able to take advantage of the yields from TOGA planting. Making and serving of *Wedang Uwuh* herbal was illustrated in Figure 7.

ISSN: 2774-6011 print
2774-6348 online

Figure 7. Making and Serving of *Wedang Uwuh* Herbal Beverages

CONCLUSION

Based on the implementation of the community empowerment program, the following results were obtained: the Seketi community gained insight into homemade medicinal plants; The people of Seketi acquire skills in the processing of TOGA into herbal beverage *Wedang Uwuh* to increase immunity (immunomodulators) during the Covid-19 pandemic; increase in Seketi community productivity using their home yards as TOGA planting medium.

SUGGESTION

Several things must be considered by the apparatus or the Head of Seketi Hamlet namely, the procurement of advanced programs. This program is carried out through entrepreneurship training to create superior products from TOGA. For the people of Seketi Hamlet, it is hoped that they can collaborate in the maintenance of the Seketi Hamlet Health Garden in order to reap long term benefits.

ACKNOWLEDGEMENT

The implementation team would like to express their gratitude to the Head of Jatidukuh Village, Head of Seketi Hamlet, the neighbourhood administrator, Karang Taruna and the residents of Seketi for their contribution and support during the implementation of the Thematic KKN. The team would also like to thank LPPM Ubhara Surya. The team would like to thank students of group 20 thematic community services batch 1 who had spent their time, energy, and loyalty in the implementation of this community service activity.

REFERENCES

Damanik, S. E. (2019). *Pemberdayaan Masyarakat Desa Sekitar Kawasan Hutan*. Ponorogo: Uwais Inspirasi Indonesia Press.

Damsar & Indrayani. (2016). *Pengantar Sosiologi Perdesaan*. Ed.1. Kencana-Prenadamedia Group.

Harjono, Y., Yusmaini, H., & Bahar, M. (2017). Penyuluhan Pemanfaatan Tanaman Obat Keluarga dan Penanaman Tanaman Obat Keluarga di Kampung Mekar Bakti 01/01, Desa Mekar Bakti Kabupaten Tangerang. *JPM (Jurnal Pengabdian Masyakat) Ruwa Jurai*, *3*(1), 16-22.

Kusuma W., D., Ekasari, W., Witono, J. R., & Purnobasuki, H. (2016). *Toga indonesia*. Surabaya: Airlangga University Press.

Mindarti, S., & Nurbaeti, B. (2015). Buku Saku Tanaman Obat Keluarga (TOGA). Bandung. Jawa Barat: Balai Pengkajian Teknologi Pertanian (BPTP)

Patola, F. M. (2018). Pelatihan dan Pendampingan Budidaya Tanaman Obat Keluarga di Pekarangan. Adi Widya: *Jurnal Pengabdian Masyarakat*, 2(2): 185-190

Parvez, G. M. (2017). Pharmacological Activities of Mango (Mangifera Indica) : A Review. Journal of Pharmacognosy and Phytochemistry JPP, 5(3), 1-7

Permendesa PDTT 17 Tahun 2019 tentang Pedoman Umum Pembangunan dan Pemberdayaan Masyarakat Desa.

Widyanata, Jerry, K.A., Mayadewi, N.N.A., Cahyaningrum, P.L., Trarintya, M.A.P., Muryani, N. M. S., Daryaswanti, P. I., ... & Putra, I.G.Y. (2020). *PemanfaatanTanaman Obat Keluarga (TOGA) di Masa Pandemi COVID-19*. Denpasar:Jayapangus Press Books.

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 1-15, 2021
ISSN: 2774-6011 print
2774-6348 online

Original Title:
Pemberdayaan Masyarakat melalui Budidaya Toga serta Minuman Herbal "Wedang Uwuh" di Dusun Seketi

Abstrak. Pemberdayaan masyarakat desa adalah upaya mengembangkan kemandirian dan kesejahteraan masyarakat dengan meningkatkan pengetahuan, sikap, keterampilan, perilaku, kemampuan, kesadaran, serta pemanfaatan sumber daya. Hal ini dilaksanakan dengan menetapkan kebijakan, program, kegiatan, dan mendampingi sesuai dengan esensi masalah dari prioritas kebutuhan masyarakat desa dalam meningkatkan aktivitas masyarakat melalui budi daya tanaman obat keluarga. Tanaman obat keluarga (Toga) adalah tumbuhan berkhasiat sebagai obat tradisional. Tanaman obat ini bisa dimanfaatkan untuk pembuatan *wedang uwuh.* Bahan pembuatannya terdiri atas berbagai jenis rempah-rempah, yaitu jahe, cengkih, daun pala, daun serai, kapulaga, kayu manis, kayu secang, dan rosela. Metode yang digunakan dalam pelaksanaan program ini, yaitu melalui difusi ilmu pengetahuan serta praktik langsung. Sasaran kegiatan ini, yaitu masyarakat Dusun Seketi. Hasil kegiatan yang telah dilakukan di Dusun Seketi sebagai berikut: masyarakat mendapatkan wawasan tentang Toga; masyarakat memperoleh keterampilan cara mengolah Toga sebagai minuman herbal *wedang uwuh* yang dapat meningkatkan daya tahan tubuh (imunomodulator) di tengah pandemi Covid-19; menambah atau meningkatkan aktivitas masyarakat melalui pemanfaatan lahan pekarangan rumah sebagai media tanam Toga. Oleh karena itu, perlu dilakukan beberapa hal yang harus diperhatikan oleh Kepala Dusun Seketi, yaitu pengadaan program lanjutan berupa pelatihan kewirausahaan guna menciptakan produk unggulan dari hasil Toga dan kerja sama masyarakatnya secara berkesinambungan merawat "Taman Sehat Dusun Seketi" sehingga manfaatnya dapat dirasakan secara jangka panjang.

Kata kunci: Pemberdayaan masyarakat, TOGA, wedang uwuh

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.16-27, 2021
ISSN: 2774-6011 print
2774-6348 online

Application of Smart Oven Technology as an Effort to Increase Smoked Egg Production and Quality in Sania MSME

Yena Arifa*, Nurul Humaidah, Feri Widodo, Muhammad Muizzhuddin, Bibit Pranoto

Program Studi Peternakan, Universitas Islam Malang, Jl. Mayjen Haryono No. 193, Dinoyo, Malang, Indonesia, 65144

Correspondence: yenaarifa23@gmail.com
Received: *9 August 2021* – Revised: *24 August 2021* - Accepted: *30 August 2021*

Abstract. Mitra Home salted egg industry SANIA MSME is an MSME that engages in duck cultivation and the production of Smoked Salted Eggs. SANIA MSME was founded by a duck breeder group in 2008 in Kawedusan Ponggok Village, Blitar. Smoked salted eggs are known for their burnt/smoky aroma and greasy egg yolks. Smoked egg production is done manually using the use of smoking drums. These manual devices are only capable of baking 150 grains per day. Meanwhile, damage due to smoking with an oven drum can reach up to 15-20%. This can reduce profits by up to 20% per cycle of the smoking process. Damage occurs when users forget or are too late to lower the drum oven's temperature before it reaches temperatures of 1000C or more. The uneven heat can also result in a reduction to taste and greasiness of the egg yolks. Manual ovens take 7-10 hours at 80-900C to cook. From discussions with partners, it was discovered that they needed egg smoking ovens that feature thermoregulators and can produce even flows of smoke automatically. There is a need for technological innovation in the egg fumigation equipment category in the form of smart egg smoking ovens complete with thermoregulators and automatic smoke airflow systems. Smart ovens have the potential to increase productivity by 75% with a faster smoking process of 3-4 hours. The service method was carried out by way of producing a design for smart ovens, socialization and assistance in the use of the device, assistance in the production of smoked eggs, and program evaluation. The results of the mentoring activity suggested that the production of smoked eggs can increase by 70% with the level of cooking damage sitting at less than 10% and an improvement in the product's taste.

Keywords: Smoked salted eggs, thermoregulator, smoke airflow, oven, greasy

Citation Format: Arifa, Y., Humaidah, N., Widodo, F., Muizzhuddin, M., & Pranoto, B. (2021). Application of Smart Oven Technology as an Effort to Increase Smoked Egg Production and Quality in Sania MSME. *Journal of Community Practice and Social Welfare*, 1(2), 16-27.

ISSN: 2774-6011 print
2774-6348 online
Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.16-27, 2021

INTRODUCTION

Currently, the COVID-19 pandemic has hit the world, including Indonesia, with its effects reverberating across various sectors, one of which is the reduction of economic growth in almost all parts of Indonesia. Although the economic shock caused by the pandemic has gradually subsided as the domestic financial market stabilized and several economic sectors have sprung up, given its effect on both the supply and demand sides of the economy, recovery efforts still require more time (Modjo, 2020). The spread of the virus has also shown no signs of slowing down as the trend for confirmed cases and deaths continues to increase. Because of this, the government has imposed an emergency Community Activity Restriction (PPKM). The negative effects of PPKM implementation are significant on the local economy which will encourage a decrease in gross domestic product (GDP) growth in 2021 by 0.5%-1% of the baseline projection, resulting in a significant economic slowdown.

The economic slowdown has also affected the livestock sector, one of which is the "Sania MSME" industry. Sania MSME was established through the initiative of a duck breeder group in 2008. The business location is in Sumanding Hamlet, RT 03 RW 06, Kawedusan Ponggok Village, Blitar. The business began with as little as 100 ducks and a production capacity of 60-70 eggs but has now expanded to produce 8000 eggs/week. The selling price of good quality duck eggs is between Rp. 1,500 – Rp. 1.700 / item or Rp. 30,000 – Rp. 40,000/kg. Since 2014, duck egg farming has become a popular trend. Many new competing duck breeder entrepreneurs had sprung up, resulting in a decrease in the selling power of duck eggs by up to 30%.

Figure 1. Community activity on the making of smoked salted eggs

ISSN: 2774-6011 print
2774-6348 online

Salted egg is a product that is savored by the general population. The production of salted egg is through the process of ionization of NaCl salt which then diffuses into the egg through the pores of the outer shell. The production of salted egg is not only for food preservation but also to improve their taste. The most common method of production is through a traditional method, namely by soaking eggs in salt solutions and wrapping them in clay mud mixed with red brick powder or by directly rubbing burnt ash onto them. salt penetration by diffusion in traditional salting methods takes place slowly. Speeding up the process at which the salt penetrates the egg can be done by increasing the level of NaCl in the soaking solution. In addition to this, to speed up salt penetration, the egg salting process can also make use of the pressure method. The pressure method is a way to improve the quality of salted eggs and is also meant to speed up the process of making them. The pressure method is applied by increasing the osmotic pressure difference between the pressure outside and the pressure inside the egg. The higher the osmotic pressure difference, the higher the rate of diffusion of NaCl into the egg.

Salted eggs consumed by the general population have a variety of flavours and very high levels of yellow grit. These variations range from less salty to very salty and oily. This is due to differences in the concentration of salt used during the salting process. Eggs Salted with clay mud, which is a mixture of clay and salt at a ratio of 1:1, will be able to last for 30 days.

To extend the shelf life of salted eggs ever further, Sania MSME tried to innovate by producing smoked salted eggs. Smoking is a viable way of extending the shelf life of salted eggs by combining heat with chemicals such as formaldehyde and phenol which functions to inhibit the growth of bacteria (Simajuntak, 2013). Additionally, because smoked salted eggs contain less water content, longer shelf life is guaranteed. However, the process of smoking, practiced at Sania MSME is still a traditional method, namely by baking or smoking eggs in a drum/barrel. these drums/barrels have a capacity of 150 grains. The smoking process takes about 7-10 hours with a temperature between 80-90 0C. The materials used to produce the smoke are coir/coconut shells. The method has shortcomings such as temperature/heat settings and smoke flow that are not optimal. Workers must reduce the fire's intensity and remove the eggs if the temperature becomes too hot so as to not damage them. This greatly hampers the production of smoked salted eggs, both in terms of quantity and quality, and reduces the smoky/greasy taste. Smoking eggs only takes about 8 hours

using a smokehouse with a maximum temperature of 80°C. The resulting product's shelf life can go up to 37 days without affecting its protein contents. The lack of a temperature control system in the partner's smokehouse results in uncontrollable smoking and heating rates. The existing combustion chamber is an open combustion system. Exposure to oxygen keeps the fire burning and produces little smoke. The purpose of this service program is to increase the productivity of Sania MSME by replacing manual smoking drums with smoke ovens which will help improve time efficiency, increase production quantity and quality, and preserve the resulting product's taste.

PROBLEM

Along with the increasing popularity of smoked salted eggs produced by Sania MSME, the demand for smoked eggs increases every year. In 2017 the demand has reached ± 8000 grains/month. The production capacity is only capable of smoking/baking 150 grains daily. Per month, the maximum production capacity is only at 4500-5000 grains. Meanwhile, the damage caused by smoking with an oven drum can reach up to 15-20%. This can reduce profits by up to 20% per production cycle. Damage occurs when users forget or are too late to lower the drum oven's temperature before it reaches temperatures of 100ºC or more. The uneven heat can also result in a reduction in the taste and greasiness of the egg yolks. Partners needed egg smoking ovens that feature thermoregulators and can produce even flows of smoke automatically.

METHOD OF IMPLEMENTATION

The method used in this community service program is a combination of several methods, namely producing a design for smart ovens, socialization and assistance in the use of the device, assistance in the production of smoked eggs, and program evaluation, because in its implementation, before the equipment was given to partners, the program's implementation team provided training in advance on how to operate the devices to make sure the activities would run smoothly.

The stage began with the device designing phase, which considered surveys and discussions with partners on the problems associated with manual smoke drums. The results of this survey inspired a smoke oven design equipped with a thermoregulator and an automatic smoke airflow system. After completion of the design, the process continues by

ISSN: 2774-6011 print
2774-6348 online

characterizing the detailed performance of each supporting item. Next was the real-life application of smart smoke ovens in the field.

The next stage was to socialize the use of smart smoke ovens using a demonstration plot, where instructions on the functionality of the device are explained to partners, namely: fuel preparation and how to ignite the smoke source in the fire oven. Dried coconut fibers/shells (moisture content at 10-15%) were used as a source of fuel to obtain a strong smoky taste. The next step was to put salted eggs into the smoke oven, open the smoke channel into the smoke oven, and adjust the temperature in the smoke oven as needed. Usually, the temperature needs to sit around 80-90ºC. If the temperature relayed on the thermoregulator's screen reaches the desired number, turn off the heat in the fire oven. The smoking process occurs in the oven tube. The resulting smoke will flow and distribute evenly throughout the oven. This process lasts for 2-3 hours. When finished, the eggs are removed from the smoke oven and are ready to be packaged once they have cooled.

The next stage is production assistance. Production assistance was done to determine egg quality including the taste and damage percentage. In the mentoring method, mentoring was carried out on the use of smoke ovens, which is associated with productivity, the percentage of egg damage, and the taste including the egg's greasiness.

The next stage is an evaluation of the results of smoked salted egg production through the use of smart smoke ovens by paying attention to the level of doneness, taste, and the percentage of egg damage. Questionnaires were given to partners regarding the production of smoked salted eggs using smart ovens. The image below is a summary of the results of the questionnaire:

ISSN: 2774-6011 print
2774-6348 online
Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.16-27, 2021

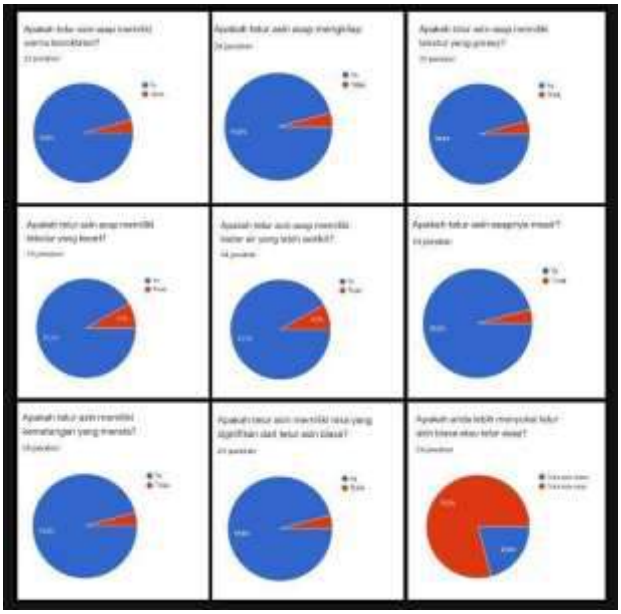

Figure 2. Smoked Salted Egg Presentation

It can be concluded that most of our partners prefer making smoked salted eggs by using smart ovens as evidenced by the data which stated that smoked salted eggs are brown, shiny, have greasy textures, are gritty, and evenly cooked at 95.8%. Smoked salted eggs made using the oven have mat textures, and less moisture content at around 91.7% and those who prefer smoked salted eggs to ordinary salted eggs are 79.2% amongst the 24 partners who filled out the questionnaires.

RESULT AND DISCUSSION

The results of the production assistance program can be seen in Table 1.

Table 1. Results of program assistance

Before Program	After Program
• Production still uses traditional oven drums	• Production using smart smoke ovens equipped with thermoregulators and automatic smoke airflow systems • Partners are given operational guidance on the use of smart ovens to facilitate ease of use and troubleshooting
• Smoke drums are only capable of baking 150 salted eggs	• Smart smoke ovens are capable of smoking and baking 300 salted eggs/smoking cycle
• Smoke drums take 7-8 hours to smoke and bake salted eggs	• Smart smoke ovens only take 3-4 hours to smoke and bake salted eggs
• Damage to the eggs from the use of smoking drums can reach up to 15-20%	• Damage to the eggs from the use of smart smoke ovens are less than 10%

ISSN: 2774-6011 print
2774-6348 online

The use of smart smoke ovens with thermoregulators and smoke airflow systems can increase the productivity of Sania SMSE. Admittedly, Modifications to the design which increases effectiveness and efficiency had already been carried out by Afridonal (2014). However, the tool only emphasizes the heat generated from the weight of coconut coir as fuel. Coconut coir weighing 23 kg produces energy of 82,685 kcal/100 smoked salted eggs. Meanwhile, research by Al-Baarri (2016) stated that an increase in temperature above 100ºC can increase damage. Based on these literatures, modifications were made to the smart smoke oven, namely automation of the thermoregulator and the addition of a smoke airflow system to even out smoke formation. The description of the tool can be seen in Figure 3.

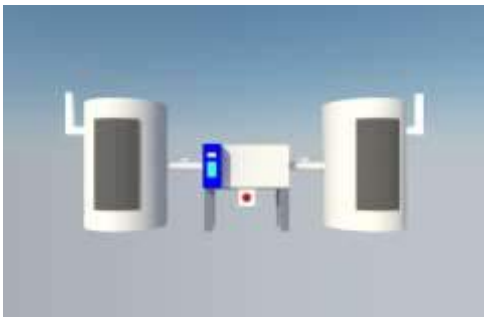

Figure 3. Smart Oven Design

A. Model Design of Smart Salted Egg Smoker Oven and Its Operational Principles

The smart smoke oven has each of the following parts: **Smoke Tubes**. consisting of two tubes. The tubes are the main component of this machine which functions as a chamber for smoking salted eggs. The tubes are made of stainless steel to provide even cooking of salted eggs. Stainless steel is a type of metal that is highly resistant to corrosion. The corrosion resistance of stainless steel is due to an invisible layer that develops due to the oxidation of stainless steel with oxygen which forms a protective anti-corrosion layer (Supriyanto, 2012). **Automatic Temperature Regulator**. This temperature regulator is equipped with a thermometer that functions as a heat regulator with a minimum temperature of 70ºC and a maximum temperature of 90ºC. **Manual Heat Regulator**. This tool serves to regulate temperature when using one of the smoke tubes for the production process. **Chimney**. The chimney serves to release smoke when the temperature reaches the maximum. **Stove**. The stove functions as a burner to produce smoke. The **Combustion Tube** serves as a fuel container for smoke generation. The burner mat serves to hold coconut coir when the burning process takes place. **Ash Partition** serves to collect ash produced during the combustion process. This eases the ash removal process. The **Egg Smoker Mat** functions to

hold eggs and accommodate for larger-scale productions and organize the eggs. The combustion tube can be seen in Figure 4.

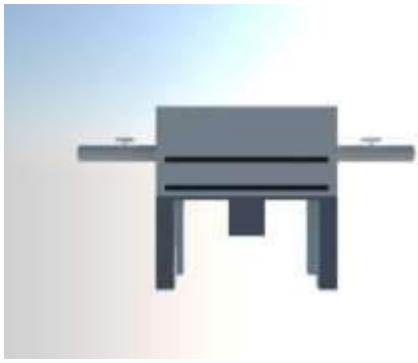

Figure 4. Smart Oven Design

Following the design process, the component design process is carried out based on the load variable and other factors to ensure the device's durability and can be used properly and safely. By this stage, it was found that adjusting the temperature to 80°C was difficult because air played a factor in the rise and fall of the stove's temperature in the Smart Oven, thus, determining wind direction is important to obtain the desired temperature.

B. Operational and Maintenance Instructions

The process of working on the smart oven machine goes as follows; namely, salted eggs that enter the tube will go through a smoking or drying process and the temperature in the oven will be maintained while the machine is working. When the temperature in the tube has reached the maximum set limit, the fan will turn off automatically until the temperature drops. And when the tube temperature reaches its lowest limit, the fan will turn on again. After approximately 2-3 hours of the smoking process, the salted egg can be directly removed from the smoke tube and cooled manually.

C. Tools and Materials preparation

LPG is fuel for kitchen utensils which are commonly used for gas stoves. LPG is an acronym for Liquefied Petroleum Gas. Aside from being a fuel source for kitchen utensils, LPG is also quite widely used as fuel for motor vehicles such as modified motorcycles. The main function of the **Regulator Hose** is to reduce pressure as the gas flows from the gas cylinder into the stove. **Ring lock** is one of the hand tools commonly used in car workshops. Usually used to disassemble parts of a car's components, both for checking and repairing. This ring lock has a hexagonal jaw shape. The goal is to make it easier to use in hidden and

ISSN: 2774-6011 print
2774-6348 online

narrow spaces. **Salted Egg** is a general term for egg-based dishes that are preserved by salting (the addition of excess salt to deactivate the breaking down of enzymes). Most salted eggs are duck eggs, although the process works for other eggs too. Coconut shell is the solid waste of processed coconuts that had their meat extracted to produce coconut milk. **Coconut shells** are generally used to make fuel, for household purposes, or to make souvenirs.

D. Materials used

The main ingredient is salted egg. Salted egg is a general term for egg-based dishes that are preserved through salting (the addition of excess salt to deactivate the breaking down of enzymes). Most salted eggs are duck eggs, although the process works for other types of eggs too.

E. Combustion Process

The combustion process is a sequence of chemical reactions between a fuel and an oxidant, accompanied by the release of heat which is sometimes accompanied by light in the form of a glow or fire. The combustion process aims to produce smoke from coconut shells that had been burnt. This combustion process is carried out at the desired temperature.

F. Smoking Process

Smoking is a method of cooking, flavouring, or preserving food. The food is smoked with heat and smoke is produced from the coconut shell. This smoking process is carried out for 2-3 hours at a temperature of 70^{o}-80^{o}C.

G. Checking Process

The checking process aims to check or sort salted eggs that have been evenly cooked, if there are still defects in the salted eggs, they can be smoked again.

H. Smoke Oven Characterisation

To ensure the smoke cabinet worked according to plan, characterization needed to be carried out first. All parts, including controllers, egg racks, and the combustion chamber were given performance tests. The test results show that all parts of the smoke oven work according to their respective functions. A single egg was tested by cooking for 3-4 hours with optimal temperatures between 70^{o}-80^{o}C and 5 minutes of stove pre-heating to produce color, texture, and taste similar to the examples provided by partners.

Figure 5. Smart Ovens Poste-Testing

I. Field Implementation

Characterization results conclude that the prototype (smart oven) and the peripherals are ready to be implemented to the home industrial (*mitra*). The independent experiment was to include 60 salted eggs (machine maximum capacity about 300 eggs) which were ready to be smoked. The eggs are smoked for 2 hours with gradually observation, to make sure it's on optimal temperature and expect to produce the finest smoked eggs. The total time of smoking with post processing were taking about 3-4 hours.

J. Implementation Results in Sania MSME Partnership

The implementation was carried out 5 times during the mentoring process using a total of 250 eggs, which can be seen in Table 2.

Table 2. Program assistance at Sania MSME

Indicator	Result (Average)
Temperature	78.9 ℃
Source of smoke	Coconut coir and shell
Time	2.95 Hours
Damage to eggs (per egg)	23 pcs
Damage to eggs (%)	< 10

Results from the Table 2 show that the smart smoke oven can be used in Sania MSME because the damage percentage was less than 10% and the smoking duration was also the fastest at 2.95 hours. This will reduce production time per smoking cycle resulting in a higher yield per day.

ISSN: 2774-6011 print
2774-6348 online

CONCLUSION

Smart smoke ovens with thermoregulators and automatic smoke airflow systems can increase the production yield of smoked salted eggs in Sania MSME by 70%. For one egg smoking cycle, the oven tube can accommodate 300 eggs. The smoking process takes about 3 hours with a temperature of 800 C and the damage rate is less than 10%.

ACKNOWLEDGEMENT

The implementation team would like to thank the Ministry of Education and Culture for funding service activities through the Student Creativity Program in Science and Technology Implementation (PKMPI), to the Islamic University of Malang for providing facilities to produce the smart oven, to supervisors, and to Sania MSME.

REFERENCES

Afidonal. (2014). Rancang Bangun Alat Pengasap Telur. Thesis. Universitas Andalas

Al-Baarri Ahmad Ni'matullah. (2016). Hardness dan Optical Properties dari Itik Asap dengan Variasi Penggunaan Suhu Oven. *Jurnal Aplikasi Teknologi Pangan*, 5(4). https://doi.org/10.17728/jatp.219

Modjo., M. I. (2020). Memetakan Jalan Penguatan Ekonomi Pasca Pandemi. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, 4(2), 103-116. https://doi.org/10.36574/jpp.v4i2.117

Simajuntak, O.E., Wasito, S. & Widayaka, K. (2013). Pengaruh Lama Pengasapan Telur Asin Asap dengan menggunakan Serabut Kelapa terhadap Kadar Air dan Jumlah Bakteri Telur Asin Asap. *Jurnal Ilmu Peternakan*, 1(1), 195–200.

Supriyanto. (2012). Kajian Pengaruh Temperin terhadap Sifat Fisis dan Mekanis Pengelasan Stainless Steel. Jurnal Teknik. 2(1).

ISSN: 2774-6011 print
2774-6348 online

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.16-27, 2021

Original Title:
Pemanfaatan Teknologi Oven Cerdas sebagai Upaya Peningkatan Produksi dan Kualitas Telur Asap di UMKM Sania

Abstrak. UMKM Mitra Home industri telur asin SANIA adalah UMKM yang bergerak dalam bidang budidaya bebek dan produksi Telur Asin Asap. UKM Sania didirikan atas inisiatif kelompok peternak bebek pada tahun 2008 di Desa Kawedusan Ponggok Blitar. Telur asin asap mempunyai taste aroma bakar/asap dan *greasy* (berminyak) pada kuning telurnya. Produksi telur asap dilakukan secara manual dengan menggunakan tong pengasapan. Dengan alat drum manual ini dalam satu hari hanya mampu mengoven 150 butir. Sedangkan kerusakan yang terjadi akibat pengasapan dengan oven drum mencapai 15-20%. Hal ini dapat mengurangi keuntungan sampai 20% per satu siklus proses produksi pengasapan. Kerusakan terjadi jika pekerja lupa atau terlambat untuk menurunkan suhu di dalam oven drum sehingga suhu meningkat mencapai 100^0C bahkan lebih. Belum lagi panas yang tidak merata mengakibatkan *taste* asap dan *greasy* pada kuning telur berkurang. Oven manual membutuhkan waktu selama 7-10 jam dengan suhu 80-90^0C. Berdasarkan diskusi dengan mitra diketahui mitra membutuhkan oven pengasap telur yang mempunyai *thermoregulator* dan aliran asap yang merata yang bisa bekerja secara otomatis. Perlu inovasi teknologi alat pengasapan telur berupa oven cerdas pengasap telur dengan *thermoregulator* dan *smoke airflow* otomatis. Oven cerdas dirancang akan meningkatkan produktivitas sebesar 75% dengan waktu pengasapan lebih cepat 3-4 jam. Metode pengabdian yang dilakukan adalah perancangan pembuatan alat oven cerdas, Sosialisasi penggunaan alat, pendampingan penggunaan alat dan pendampingan produksi telur asap dan evaluasi program. Hasil kegiatan pendampingan adalah produksi telur asap meningkat 70 % dengan kerusakan telur kurang dari 10% serta kualitas rasa dan *taste* telur yang lebih bagus.

Kata kunci: Telur asin asap*, thermoregulator, smoke airflow*, oven, *greasy*

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.28-39, 2021
ISSN: 2774-6011 print
2774-6348 online

Development of Integrated Farming Businesses Based on Zero Waste Agriculture in Parigi Moutong Regency

Burhanuddin Haji Nasir[1*], Irwan Lakani[2], Najamudin[3], Sitti Sabariyah[4], Sri Anjar Lasmini[5], Moh. Syahrul Asdar[6], I Putu Suci Astawa[7], Ilham Akbar[8], I Kadek Duis Tiana[9]

[1,2,5,6,7,8]Program Studi Agroteknologi, Fakultas Pertanian, Universitas Tadulako
[3]Program Studi Peternakan, Fakultas Peternakan dan Perikanan, Universitas Tadulako
[9]Program Studi Agribisnis, Fakultas Pertanian, Universitas Tadulako
Jalan Sukarno-Hatta Km 8, Palu-Sulawesi Tengah, Indonesia, 94118
[4]Program Studi Peternakan Fakultas Pertanian Universitas Alkhairaat Palu
Jalan Diponegoro No. 39, Palu-Sulawesi Tengah, Indonesia 94221

Correspondence: Burhanuddin Haji Nasir (burhajinasir@gmail.com)
Received: *10 August 2021* – Revised: *31 August 2021* – Accepted: *7 September 2021*

Abstract. Zero waste agriculture is an agricultural concept oriented around the decomposition cycle of organic materials which integrates agricultural and livestock systems to reprocess waste material. Agricultural waste is used as animal feed while livestock waste/excrement is reprocessed into organic fertilizers. The Regional Partnership Service Program (PKW) aims to assist farmers in developing integrated farming businesses based around zero waste agriculture. PKW was held between May and July 2021 in Tindaki Village, South Parigi District, Parigi Moutong Regency. The implementation of this regional partnership program was carried out through a Participatory Action Programs approach, where partners are directly involved in the adoption and application of the various skills that had been developed. The procedure for activity implementation was carried out through several stages, namely: (a) counseling on zero waste agriculture, (b) training in and application of zero waste agriculture technology in the form of demonstration plots for the application of technological products, (c) coaching and mentoring, and (d) the utilization stage of technology product. The findings from the implementation concluded that the agricultural development training based on zero waste agriculture was a success, and the technology had been adopted by the community, marked by the ability to make and develop compost and liquid organic bio-urine fertilizers. Both types of organic fertilizers had been applied in the demonstration plots to assess their effectiveness in reducing the use of inorganic fertilizers. Rice production is equivalent to 5.6 tons/ha and 6 tons/ha in conventional land. These results show potential benefits for farmers, particularly regarding lower production costs compared to the usage of conventional land. Zero waste agriculture is a method of farming and livestock raising that utilizes their waste products for energy production.

Keywords: Livestock feces, agricultural-livestock waste, cow urine, zero-waste agriculture

Citation Format: Nasir, B.H., Lakani, I., Najamudin, Sabariyah, S., Lasmini, S.A, Asdar, M.S., Astawa, I.P.S., Akbar, I., & Tiana, I.K.D. (2021). Development of Integrated Farming Businesses Based on Zero Waste Agriculture in Parigi Moutong Regency. *Journal of Community Practice and Social Welfare*, 1(2), 28-39.

ISSN: 2774-6011 print
2774-6348 online

INTRODUCTION

The integrated farming system is a farming system that combines various agricultural practices in such a way that creates continuity between production and utilization of natural resources. In an integrated farming system, all potential resources within each farming component are utilized optimally under the zero-waste principle. In other words, no waste or by-products are wasted.

Agricultural and livestock wastes include farming resources that have not been properly utilized and can be a source of environmental pollution (Hayati et al., 2018). To reduce environmental hazards, the wastes can be repurposed to have some form of economic value. Management of agricultural and livestock waste can also reduce spendings as it makes use of by-products that would otherwise have no economic value (Yuwono & Ichwan, 2013).

South Parigi District is one of several sub-districts in Parigi Moutong Regency. The majority of the population works in the agricultural sector, both in food crops production and plantations. The area covers 396.42 km^2 or 6.36% of the total area of Parigi Moutong Regency, 8 km from the district capital, with the sub-district capital located in Dolago Village. Geographically, South Parigi District is located between $4^0$40' North Latitude and $0^0$14' South Latitude, and 119^{0}45' and 121^{0}06' East Longitude. The regional boundaries to the north is bordered by Olaya Village and Kayuboko Village, Parigi District; the east is bordered by Tomini Bay; the south is bordered by Tanalanto Village, Torue District; and the west is bordered by Donggala Regency (South Parigi District in Numbers, 2020).

Potential resources in South Parigi District include land resources in the form of rice fields, plantations, and livestock raising of cattle. Both types of resources and their by-products have the potential to improve the community's standard of living if managed optimally. However, such potential has not been noticed by farmers or ranchers.

Many farmers manage side businesses as breeders, but these businesses are still employing conventional practices. In addition to producing rice paddy, the farmers are also producing agricultural waste in the form of straws. Straw was directly used as cattle feed without going through feed processing technology resulting in poor quality. Farmers also produce wastes in the form of feces and urine, but the feces are only used as fertilizer without going through processing, while urine is disposed of. For this reason, the concept of agriculture and animal husbandry integration is needed in the context of implementing zero waste production management to diversify the farmers' source of income.

ISSN: 2774-6011 print
2774-6348 online

Integrated farming systems can support the availability of manure for agriculture. By applying the principles of zero waste agriculture, by-products of agricultural cultivation can become animal feed and livestock waste/manure can be processed into organic fertilizers. Integration between livestock and crops can increase economic benefits and can improve soil fertility. The application of zero waste agriculture concept is expected to be a potential alternative for environmentally friendly agricultural land management.

Hilimire (2011) states that agriculture-livestock integration can improve soil quality, increase yields, diversify food production and improve land-use efficiency. The benefits of agriculture-livestock integration can be synthesized into: (1) agronomic aspects, namely increasing soil capacity for agriculture, (2) economic aspects, namely product diversification, higher yields and quality, and lowering of costs, (3) ecological aspects, namely pest and erosion control and the use of pesticides, and (4) social aspects, namely more equitable distribution of income. Furthermore, (Tipraqsa et al., 2007) stated that integrated agriculture can also create new jobs in rural areas and reduce urbanization.

The utilization of livestock manures as organic fertilizer, in addition to being able to reduce the reliance on inorganic fertilizers, is also able to improve the structure and availability of soil nutrients. This effect is observable through an increase in land productivity. Adnyana (2003) showed that the CLS (Crops Livestock System) model employed in East and Central Java was able to reduce the use of inorganic fertilizers by 25-35% and increase rice productivity by 20-29%. The CLS model applied by farmers in Bali was also able to reduce spendings on fertilizers by around 25.2% and increase farmers' income by 41.40% (Sudaratmadja et al., 2004). The regional partnership program (PKW) service program aims to assist farmers in developing integrated farming businesses based on zero waste agriculture to increase financial income and maintain, improve, and preserve environmental quality at the same time.

PROBLEM

The problem in developing sustainable integrated agriculture among farmers, especially in Tindaki Village, South Parigi District, is the relatively low level of education which affects their mindset. In addition, there is a high dependency on the use of chemical fertilizers and pesticides. Shifting such habits into the use of environmentally friendly organic materials will require time. Thus, practical and easily implementable technologies

ISSN: 2774-6011 print
2774-6348 online

are needed to ease its adoption by the community. This technology is a form of waste-free farming by producing compost and liquid organic fertilizers.

METHOD OF IMPLEMENTATION

The regional partnership program (PKW) service program was carried out from May to July 2021 in Tindaki Village, South Parigi District, Parigi Moutong Regency. The implementation of this regional partnership program was carried out using a Participatory Action Programs approach where partner farmers who were involved in the program directly follow and apply the various skills that had been provided by the implementation team. The implementation procedure was carried out in several stages, namely: (a) zero-waste agriculture counseling, (b) zero-waste agriculture technology training, (c) zero-waste agriculture technology application in the form of demonstration plots for technology product applications, (d) coaching and mentoring, and (e) the stage of utilizing the resulting technological product in the form of organic fertilizers.

RESULT AND DISCUSSION

A. Counseling and training on the use of cattle waste

Improving the knowledge and attitudes of partner farmers towards the zero-waste concept is done by carrying out a series of activities in the form of training, demonstration plot applications, and mentoring. The training was carried out in the Tindaki Village Head Office Hall, with resource personnel from the implementation team and lecturers from the Faculty of Agriculture of Untad University. Also attending the counseling and training activities were the Head of the Tindaki Village and the Regional Development Planning and Research Agency (BAPPELITBANGDA) team of Parigi Moutong Regency as the partner implementation team, namely the Head of the Economics Division and the Head of the Sub-Division of Economics I (Figure 1). The implementation of counseling and training aims to provide knowledge and skills to partner farmers regarding the potential and importance of processing and utilizing cattle waste into products of economic value in the form of compost and liquid organic fertilizers. With such training, it is hoped that there will be a mindset change amongst the partner farmers.

From the material presented by the resource person, it was conveyed that organic fertilizers, including compost and liquid organic fertilizers, have several advantages, namely improving the physical and chemical properties of soil, which are characterized by an

ISSN: 2774-6011 print
2774-6348 online

increase in the soil's c-organic, providing comprehensive macro and micronutrients so as to reduce the use of inorganic fertilizers, increasing the diversity and population of soil organisms, as well as being safe for usage and the environment. The presentation was followed by training on the making and development of compost and liquid organic fertilizers.

Figure 1. The atmosphere during counseling and training.

Compost development activities begin with the collection of materials needed for the development of compost, namely dry (ripe) cow dung, rice straws, plant stoves, rice bran and husks, and EM-4 bioactivators. Afterward, the compost-making practice was carried out (Figure 2).

Figure 2. The series of compost development implementation.

For the creation of compost, the ingredients were first mixed and stirred evenly. The EM-4 bioactivator solution was then slowly added into the mix and stirred a second time.

ISSN: 2774-6011 print
2774-6348 online

The bioactivator serves to accelerate the composting process (Sasaki et al., 2016; Zhou et al., 2015). To keep the humidity at 30-40%, the mixture was clenched until it clumps together without releasing water. A considerate amount of water would be added if the humidity was too low. The compost material was then tightly sealed using tarpaulin or plastic and left to sit for 7–28 days. Fermentation temperature was controlled to stay at temperatures between 40-50˚C maximum. If the maximum temperature was exceeded, stirring the mixture using a shovel can reduce it. After 28 days, organic fertilizers are usually formed and ready to be used.

B. Bio-urine liquid organic fertilizer development

The development of bio-urine liquid organic fertilizer is intended to utilize cow urine obtained during the process of cow feces collection. Cow urine that was collected from cattle pens in bucket containers is put in a plastic storage container with a capacity of 100-150 liters and can then be used as liquid bio-urine fertilizer (Figure 3). The results of the study on the use of bio-culture and bio-urine as liquid fertilizers as reported by Santosa et al. (2015), Lasmini et al. (2018), Ohorella (2012), Nurtika et al. (2008). The results of this study indicate that bio-culture liquid fertilizers and bio-urines can improve soil's physical and biological properties (Pradhan et al., 2018), by acting as growth triggers and antimicrobials (Jandaik et al., 2015) and, in turn, increase crop yield growth (Lasmini et al., 2015, 2019a, 2019b; Oliveira et al., 2009). Thus, bio-urine liquid organic fertilizer is an alternative product that can be used to support organic farming activities (Nasir et al., 2020).

Figure 3. The atmosphere during training on the making of bio-urine liquid organic fertilizer.

ISSN: 2774-6011 print
2774-6348 online

The utilization of cow feces and urine as liquid organic fertilizers, in addition to reducing environmental pollution, can also provide farmers with the medium that is becoming increasingly expensive and difficult to obtain in the market. By developing their own organic fertilizers, farmers will benefit in terms of production needs as well as from a financial perspective.

C. Demonstration plot for the use of agricultural and livestock wastes as alternative energy

A demonstration plot for the reprocessing of agricultural and livestock waste into energy, in this case, the compost application that had previously been made, was carried out in the rice fields owned by one of the training participants. In the previously treated fields, compost was applied at a dose of 10 tons/ha by scattering evenly on the fields one week before planting (Figure 4). Afterward, rice planting was carried out in accordance with the local government's recommendations. Plant maintenance is carried out by removing weeds while pest and disease control was carried out preventively and curatively if signs of pests and symptoms of diseases are detected.

Figure 4. Techniques for applying compost to paddy fields.

A demonstration plot for the reprocessing of agricultural and livestock waste into energy, in this case, the compost application that had previously been made, was carried out in the rice fields owned by one of the training participants. In the previously treated fields, compost was applied at a dose of 10 tons/ha by scattering evenly on the fields one week before planting (Figure 4). Afterward, rice planting was carried out in accordance with the local government's recommendations. Plant maintenance is carried out by removing weeds while pest and disease control was carried out preventively and curatively if signs of pests and symptoms of diseases are detected.

ISSN: 2774-6011 print
2774-6348 online

The results from the demonstration plot showed that rice plants treated with compost at a dose of 10 tons/ha or liquid organic fertilizer bio-urine at a dose of 500 l/ha produced 5.6 tons/ha of rice while conventional ones produced 6 tons/ha of rice. If production costs are calculated, with the assumption that to make 1 tonne of compost, the cost of collecting raw materials and EM-4 bioactivator is Rp. 200,000, - then every 10 tons requires a fee of Rp. 2,000,000., - meanwhile, inorganic fertilizers in the form of compound NPK fertilizer, require around 275-300 kg/ha with a price of Rp. 12,000/kg and an additional fee of Rp. 3,600,000. There is a discrepancy in operational costs by Rp. 1,600,000/ha, which makes organic fertilizers more profitable for farmers. In addition, the use of organic fertilizers has a positive impact on the continuity and sustainability of farming because agricultural land will recover from organic matter shortages.

Lasmini et al. (2015) and Santosa et al. (2015) suggested that compost and liquid organic fertilizers contain macronutrients and micronutrients needed by plants to produce yields. This means, with the addition of compost and liquid bio-culture fertilizer, plants will be able to grow optimally and produce high yields. Results from the analysis chemical composition of bio-urine liquid fertilizer (dry-based analysis), showed a pH value of 6.86, organic-C content of 17.25%, nitrogen of 2.25%, phosphorus of 0.67%, and potassium of 1.32% (Matheus et al., 2019).

D. Guidance and mentoring

The next stage is to assist each partner in product utilization. The products produced by the target partners during training activities are compost and bio-urine liquid fertilizers. The two products have been utilized by partner members for their farming activities. The implementation team provided periodical guidance and assistance to members of partner farmer groups in improving production techniques including product packaging and labeling as well as improving the application of the method, particularly regarding dosage and concentrations to maximize the obtainable results. Guidance and mentoring are also provided for the construction of example cages and organic fertilizer production houses (Figure 5).

ISSN: 2774-6011 print
2774-6348 online

Figure 5. Assistance activities and demonstration plots for the application of zero waste agricultural technology

CONCLUSION

Through the implementation of the PKW program, it can be concluded that the implementation of integrated farming development training based on zero waste agriculture went well, and the relayed technology can be adopted by the community, which is marked by the community's ability to make and develop compost and liquid organic bio-urine fertilizers. Both types of organic fertilizers were applied in the demonstration plots to determine how much they reduce the need for inorganic fertilizers. Rice production in the demonstration plot area was equivalent to 5.6 tons/ha, while in conventional land, the yield was 6 tons/ha. These results show potential benefits for farmers where production costs are lower when compared to data findings from conventional land.

ACKNOWLEDGEMENT

Funded by the Directorate of Research and Community Service, the Directorate General of Research and Development, and the Ministry of Research and Technology per the Agreement on Assigning the Implementation of the Community Service Program Number: 078/SP2H/PPM/DRPM/2021.

ISSN: 2774-6011 print
2774-6348 online

REFERENCES

Adnyana. (2003). Pengkajian dan sintesis kebijakan pengembangan peningkatan produktivitas padi dan ternak (P3T). Laporan Teknis Pusat Penelitian dan Pengembangan Tanaman Pangan. Litbang Pertanian Bogor. www.balitbang.go.id

Hayati, N., Najamudin, Sulaeman, & Lasmini, S. A. (2018). Program kemitraan wilayah dalam mengembangkan potensi sumber daya pertanian berbasis teknologi pertanian terpadu di Kabupaten Buol. Agrokreatif Jurnal Ilmiah Pengabdian kepada Masyarakat, 4(2), 174. https://doi.org/10.29244/agrokreatif.4.2.174-180

Hilimire, K. (2011). Integrated crop/livestock agriculture in the United States: A Review. Journal of Sustainable Agriculture, 35(4), 376–393. https://doi.org/10.1080/10440046.2011.562042

Jandaik, S., Thakur, P., & Kumar, V. (2015). Efficacy of cow urine as plant growth enhancer and antifungal agent. Advances in Agriculture, 2015, 1–7. https://doi.org/10.1155/2015/620368

South Parigi District in Numbers (Kecamatan Parigi Selatan Dalam Angka). (2020). Letak Kecamatan Parigi Selatan Berdasarkan posisi geografisnya. Badan Pusat Statistik Kabupaten Parigi Moutong.

Lasmini, S.A., Kusuma Z., Santoso, M., and Abadi, A.L. 2015. Application of organic and inorganic fertilizer improving the quantity and quality of shallot yield on dry land. *Int. J. Sci. Tech. Res. 4* (4): 243-246

Lasmini, S. A., Idham, I., Monde, A., & Tarsono, T. (2019). Pelatihan pembuatan dan pengembangan pupuk organik cair biokultur dan biourin untuk mendukung sistem budidaya sayuran organik. PengabdianMu: Jurnal Ilmiah Pengabdian Kepada Masyarakat, 4(2), 99–104. https://doi.org/10.33084/pengabdianmu.v4i2.891

Lasmini, S.A., Wahyudi, I., Rosmini, R., Nasir, B. & Edy, N. (2019). Combined application of mulches and organic fertilizers enhance shallot production in dryland. Agronomy Research 17(1), 165–175. https://doi.org/10.15159/AR.19.017

Lasmini, S. A., Wahyudi, I., & , R. (2018). Aplikasi mulsa dan biokultur urin sapi terhadap pertumbuhan dan hasil bawang merah. Jurnal Hortikultura Indonesia, 9(2), 103–110. https://doi.org/10.29244/jhi.9.2.103-110

Matheus, R., Abineno, J.C., & Jehamat, A. (2019). Penerapan konsep zero waste dalam usaha penggemukan sapi: Upaya untuk meningkatkan nilai ekonomi limbah ternak. *Jurnal Pengabdian Masyarakat Peternakan* *4*(2), 155-163.

Nasir, B., Najamudin, N., Lakani, I., Lasmini, S. A., & Sabariyah, S. (2020). Pembuatan pupuk organik cair dan biofungisida trichoderma untuk mendukung sistem pertanian organik. Jurnal Penelitian dan Pengabdian Kepada Masyarakat UNSIQ, 7(2), 115–120. https://doi.org/10.32699/ppkm.v7i2.756

Nurtika, N., Sofiari, E., & Sopha, G. A. (2008). Pengaruh biokultur dan pupuk anorganik terhadap pertumbuhan dan hasil kentang varietas Granola. Jurnal Hortikultura, 18(3), 267–277.

ISSN: 2774-6011 print
2774-6348 online

Oliveira, N. L. C. de, Puiatti, M., Santos, R. H. S., Cecon, P. R., & Rodrigues, P. H. R. (2009). Soil and leaf fertilization of lettuce crop with cow urine. Horticultura Brasileira, 27(4), 431–437. https://doi.org/10.1590/S0102-05362009000400006

Pradhan, S. S., Verma, S., Kumari, S., & Singh, Y. (2018). Bio-efficacy of cow urine on crop production: A review. International Journal of Chemical Studies, 6(3), 298–301.

Santosa, M., Suryanto, A., & Maghfoer, Moch. D. (2015). Application of biourine on growth and yield of shallot fertilized with inorganic and organic fertilizer in Batu, East Java. AGRIVITA Journal of Agricultural Science, 37(3), 290–295. https://doi.org/10.17503/Agrivita-2015-37-3-p290-295

Sasaki, K., Okamoto, M., Shirai, T., Tsuge, Y., Fujino, A., Sasaki, D., Morita, M., Matsuda, F., Kikuchi, J., & Kondo, A. (2016). Toward the complete utilization of rice straw: Methane fermentation and lignin recovery by a combinational process involving mechanical milling, supporting material and nanofiltration. Bioresource Technology, 216, 830–837. https://doi.org/10.1016/j.biortech.2016.06.029

Sudaratmadja, I.G.A.K., Suyasa, N., & Dana-Arsana, I.G.K. (2004). Subak dalam Perspektif Sistem Perpaduan Padi-ternak di Bali. Prosiding Lokakarya Sistem dan Kelembagaan Usahatani Tanaman. Badan Litbang Pertanian. Jakarta.

Tipraqsa, P., Craswell, E. T., Noble, A. D., & Schmidt-Vogt, D. (2007). Resource integration for multiple benefits: Multifunctionality of integrated farming systems in Northeast Thailand. Agricultural Systems, 94(3), 694–703. https://doi.org/10.1016/j.agsy.2007.02.009

Yuwono, A. S., & Ichwan, N. (2013). Implementasi konsep "zero waste production management" bidang pertanian: Pengomposan jerami padi organik dan pemanfaatannya. Jurnal Bumi Lestari, 13(2), 8.

Zhou, C., Liu, Z., Huang, Z.-L., Dong, M., Yu, X.-L., & Ning, P. (2015). A new strategy for co-composting dairy manure with rice straw: Addition of different inocula at three stages of composting. Waste Management, 40, 38–43. https://doi.org/10.1016/j.wasman.2015.03.016

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp.28-39, 2021
ISSN: 2774-6011 print
2774-6348 online

Original Title:
Pengembangan Usaha Tani Terpadu Berbasis *Zero Waste Agriculture* di Kabupaten Parigi Moutong

Abstrak. *Zero waste agriculture* merupakan konsep pertanian yang berorientasi pada siklus penguraian makhluk hidup dengan mengintegrasikan sistem pertanian dan peternakan sehingga tidak ada limbah yang terbuang. Limbah budidaya pertanian akan menjadi pakan ternak dan limbah/kotoran ternak akan digunakan sebagai bahan pembuatan pupuk organik. Program pengabdian kemitraan wilayah (PKW) bertujuan untuk mendampingi petani dalam pengembangan usaha tani terpadu berbasis *zero waste agriculture*. PKW dilaksanakan pada bulan Mei sampai dengan Juli 2021 di Desa Tindaki Kecamatan Parigi Selatan Kabupaten Parigi Moutong. Pelaksanaan program kemitraan wilayah ini dilakukan dengan pendekatan *Participatory Action Programs,* yakni petani mitra yang terlibat secara langsung mengikuti dan menerapkan berbagai ketrampilan yang telah diberikan. Prosedur pelaksanaan kegiatan dilakukan dengan beberapa tahapan, yaitu: (a) penyuluhan *zero waste agriculture*, (b) pelatihan teknologi dan penerapan teknologi *zero waste agriculture* berupa demplot aplikasi produk teknologi, (d) pembinaan dan pendampingan, serta (e) tahap pemanfaatan produk teknologi yang dihasilkan. Hasil pelaksanaan disimpulkan bahwa pelatihan pengembangan usaha tani berbasis *zero waste agriculture* berlangsung dengan baik dan teknologi yang disampaikan dapat diadopsi oleh masyarakat, ditandai dengan kemampuan dalam membuat dan mengembangkan kompos dan pupuk organik cair biourin. Kedua jenis pupuk organik telah diaplikasikan di lahan demplot untuk menentukan efektivitasnya dalam mengurangi pemakaian pupuk anorganik. Produksi padi diperoleh hasil setara 5,6 ton/ha sedangkan di lahan konvensional diperoleh 6 ton/ha. Hasil tersebut sangat menguntungkan petani karena biaya produksi lebih rendah dibandingkan di lahan konvensional. Zero waste agriculture merupakan suatu cara bertani dan beternak yang memanfaatkan limbah pertanian dan limbah peternakan menjadi energi.

Kata kunci: Feses kotoran ternak, limbah pertanian-peternakan, urin sapi, zero waste agriculture

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 40-53, 2021
ISSN 2774-6011 print
2774-6348 online

GIS-Based Landslide Disaster Risk Areas and Ground Movements Mapping to Support Disaster Mitigation Activities (Case Study: Tasikmalaya Regency)

Novi Asniar [1*], Anri Noor Annisa Ramadan[1] dan Aso Sudiarjo[2]

[1]Civil Engineering Study Program, Faculty of Engineering, Universitas Perjuangan Tasikmalaya. Jl. Peta No.177, Kahuripan, Kec. Tawang, Tasikmalaya, Jawa Barat 46115
[2]Informatics Engineering Study Program, Faculty of Engineering, Universitas Perjuangan Tasikmalaya. Jl. Peta No.177, Kahuripan, Kec. Tawang, Tasikmalaya, Jawa Barat 46115

Correspondence: noviasniar@unper.ac.id
Received: *11 August 2021* – Revised: *4 October 2021* - Accepted: *8 October 2021*

Abstract. Tasikmalaya Regency is an area that is prone to landslides and ground movements. The availability of comprehensive and accurate information in controlling land use for regional development in areas prone to landslides and ground movements is very important for casualty prevention and other losses such as physical, social and economic. This information must be disseminated to the public as an early warning system to support disaster mitigation efforts. Identification of the characteristics of landslide and ground movement prone areas requires the mapping of risk areas to mitigate disasters. This can be done using Geographic Information System (GIS). This mapping activity was carried out using the method of collecting digital data from five vulnerability controlling factors of landslides and ground movements, namely rainfall, rock type, soil type, land cover and slope. The analysis is continued by weighting the factors that influence landslides and ground motion and then overlaying the five controlling factor maps (with their respective weight values) to produce a landslides and ground movement vulnerability level map which is then inputted into WebGIS. This map can then be used by local governments and the public as an information medium to support disaster mitigation activities.

Keywords: Controlling factors, landslide, vulnerability, WebGIS, disaster mitigation

Citation Format: Asniar, N., Ramadan, A.N.A., & Sudiarjo, A. (2021). GIS-Based Landslide Disaster Risk Areas and Ground Movements Mapping to Support Disaster Mitigation Activities (Case Study: Tasikmalaya Regency). *Journal of Community Practice and Social Welfare*, 1(2), 40-53.

ISSN 2774-6011 print
2774-6348 online

INTRODUCTION

Landslides and ground movements can cause significant repercussions such as damage and loss. The losses experienced can affect local communities. These losses can be in the form of loss of human life, damage to property and disruption of natural ecosystems (Alhasanah, 2006). Therefore, it is necessary to take action, especially in productive areas, economic routes, settlements and infrastructure (Zakaria, 2010).

The availability of comprehensive and accurate information in controlling land use for regional development in areas prone to landslides and ground movements is very important for casualty prevention and other losses such as physical, social and economic. Such information should be disseminated to the public as an early warning system. In some areas with high population density and pre-existing early warning systems, such information is not distributed evenly, leading to the possibility for differing perceptions. This may cause panic and chaos and in effect, greater loss of both property and life (Noor, 2014).

Efforts that can be done to minimize the impact of landslides and ground movements are through the recognition of the characteristics of vulnerable areas. To identify the characteristics of disaster-prone areas, the mapping of disaster-prone areas is needed (Rahmad et al., 2018). Disaster risk mapping is an activity that presents the consequences of a disaster (Aditya, 2010). The development of Geographic Information System (GIS) can provide accurate geospatial data information and an accurate analysis system. This supports mitigation efforts to prevent risks that have the potential to become disasters or minimize losses from such disasters (Faizana et al., 2015).

Geographic Information System (GIS) is a system or set of objects and ideas that are interconnected (interrelationships) and displayed as geographic information which can be presented as software technology. This technology can then be used as a tool for entry, storage, manipulation, analysis, and display of field conditions with the help of data and spatial attributes. Comprehension of the "real world" will be better if the processes of data manipulation and presentation related to geographic locations are understood. (Munir, 2014).

PROBLEM

The output target of this community service activity is to produce an information system that is directly accessible for the public regarding the mapping of at-risk areas in the Tasikmalaya Regency. This information system is a tool to support disaster mitigation activities in Tasikmalaya Regency. With information that can be accessed directly, the public

ISSN 2774-6011 print
2774-6348 online

can be more selective of residential choices, be more aware of disaster risks and be better prepared for potential disasters.

METHOD OF IMPLEMENTATION

Mapping of Landslide-prone Areas

The Making of landslide-prone area maps is based on secondary data such as rainfall maps, geological maps, slope maps, soil type maps, land cover maps and data on landslides and ground movement events that have occurred in Tasikmalaya Regency between 2013 - 2020.

Data in the form of rainfall maps, soil type maps, geological maps and contour maps are then inputted into a GIS software. The data entry process is done through a set of computers using ArcGIS 10.1 software. This output data is then used as a reference for mapping analysis of landslide-prone areas in the Tasikmalaya Regency.

Analysis of the landslide susceptibility map is carried out after the thematic parameter maps, namely rainfall maps, soil type maps, geological maps and slope maps of the area are available in the form of digital maps. Each type of map is classified based on scores and given weight, the scores are then grouped together and analyzed. The mapping was done using ArcGIS 10.1 software. In the mapping process, each parameter has a classification score which is multiplied by the weight of each parameter according to the 2004 Puslittanak estimation model. The results of the score and weight multiplication are tallied based on the compatibility of their geographical locations. Based on the 2004 Puslittanak estimation model, the parameters used to determine the level of vulnerability are land cover, soil type, land slope, rainfall and geological formation (Table 1-5).

The model used to analyze landslide susceptibility is an estimation model that refers to the 2004 Research Center for Research and Development with the following formula:

$$\text{TOTAL SCORE} = 0{,}3\text{FCH}+0{,}2\text{FBD}+0{,}2\text{FKL}+0{,}2\text{FPL}+0{,}1\text{FJT}$$

Description:

FCH	= Rainfall Factor	FPL	= Land Cover Factor
FBD	= Rock Type Factor	FJT	= Soil Type Factor
FKL	= Land Slope Factor	0,3;0,2;0,1	= Score Weight

ISSN 2774-6011 print
2774-6348 online

Table 1. Rainfall Classification (mm/year)

Parameter	Weight	Score
Very wet (>3000)		5
Wet (2501-3000)		4
Moderate (2001-2500)	30%	3
Dry (1501-2000)		2
Very dry (<1500)		1

Source: Puslittanak Bogor (2004)

Table 2. Rock Type Classification

Parameter	Weight	Score
Volcanic rocks		3
Sedimentary rocks	20%	2
Alluvial rocks		1

Source: Puslittanak Bogor (2004)

Table 3. Land Slope Classification

Parameter (%)	Weight	Score
>45		5
30-45		4
15-30	20%	3
8-15		2
<8		1

Source: Puslittanak Bogor (2004)

Table 4. Land Cover Classification

Parameter	Weight	Score
Moor, rice fields		5
Bushes		4
Forest and plantations	20%	3
City/settlements		2
Ponds, reservoirs, bodies of water		1

Source: Puslittanak Bogor (2004)

ISSN 2774-6011 print
2774-6348 online

Table 5. Soil Type Classification

Parameter	Weight	Score
Regosol		5
Andosol, podsolic		4
Brown latosol	10%	3
Yellowish-brown latosol association		2
Alluvial		1

Source: Puslittanak Bogor (2004)

Classification of the results uses score analysis and is carried out by classifying 4 types of landslide susceptibility, namely: low, medium, high and very high based on final score numbers. The greater the score number, the higher the level of vulnerability, by establishing the following score intervals:

(Highest score – Lowest score) : (Number of class classification)

Creation of a WebGIS that can be accessed by the public for free

After the landslide vulnerability map has been prepared, the next step is to post various geographical information that can be accessed by the public. The developed system must be able to provide functional and non-functional requirements.

RESULTS AND DISCUSSION

Overview of the Tasikmalaya Regency Area

Tasikmalaya Regency is an agrarian area populated by a religious community, located in the eastern region of West Java Province between 07°2'00" - 07°48'00" South Latitude and 107°54'00" - 108°26' 00" East Longitude. The western part of Tasikmalaya Regency is bordered by Garut Regency, in the east by Ciamis Regency, in the north by Tasikmalaya City and Ciamis Regency and in the south by the Southern Indonesian Ocean. Tasikmalaya Regency has an area of 2,708.81 km2 or 270,881 ha and administratively consists of 39 sub-districts (Figure 1).

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 40-53, 2021
ISSN 2774-6011 print
2774-6348 online

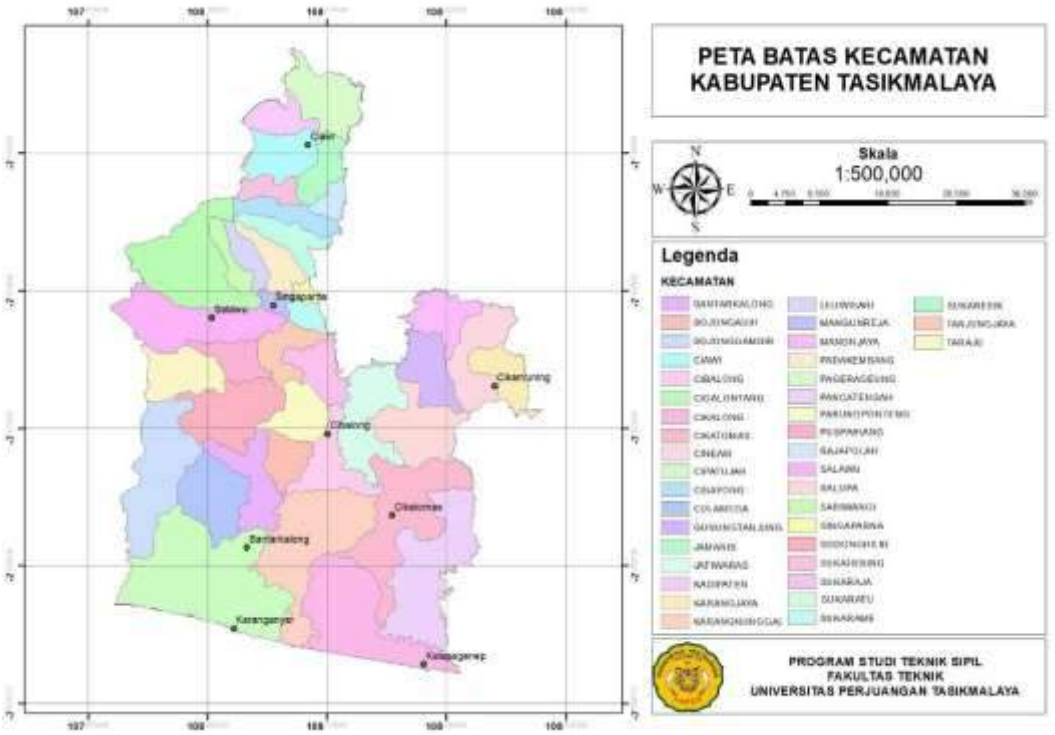

Figure 1. Tasikmalaya district boundary map

Factors Which Influence Landslides in Tasikmalaya

1. Rainfall

As one of the parameters that define landslide-prone areas, rainfall maps are produced based on the amount of rainfall, rainfall intensity and rainfall distribution. The Rainfall Map of Tasikmalaya Regency obtained from Climate Hazards Group Infrared Precipitation with Stations (CHIRPS) 2016 - 2020 is shown in Figure 2. Based on the classification of rainfall from the Bogor Research and Development Center (2004), the Tasikmalaya Regency area has high rainfall intensity.

Based on the classification of rainfall from Puslittanak Bogor (2004) all areas of Tasikmalaya Regency obtained a score of 5 because of its high rainfall wetness (> 3000 mm/year). The higher the value of rainfall intensity, the greater the influence on landslides. Likewise, heavy, and long-lasting rainfalls can increase soil mass which triggers landslides.

ISSN 2774-6011 print
2774-6348 online

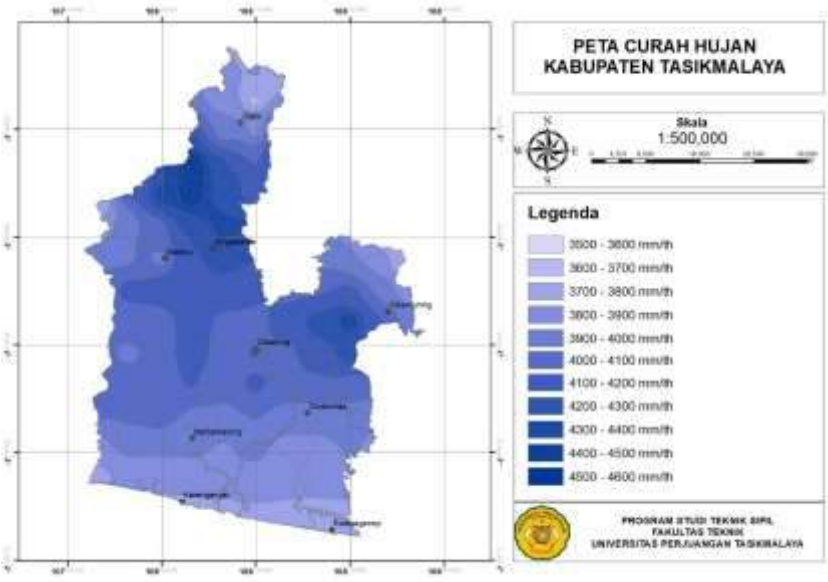

Figure 2. Tasikmalaya regency rainfall map

2. Rock Types

Rock types in Tasikmalaya Regency can be seen in Figure 3. Based on Puslittanak classification, rock formations found in Tasikmalaya Regency consist of 2 types of rock, namely volcanic rocks and alluvial rocks. Volcanic rocks consist of volcanic and limestone formations, while alluvial rocks consist of southern coastal rock formations. The rock type map is weighted based on Table 2, then inputted into ArcGIS which will eventually be overlaid with other mapping parameters.

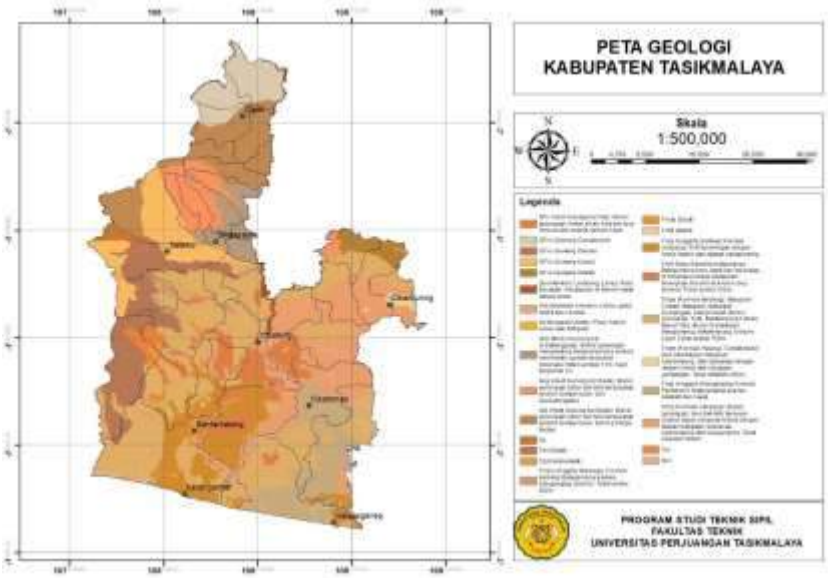

Figure 3. Geological map of Tasikmalaya regency

ISSN 2774-6011 print
2774-6348 online

3. Soil Type

Soil type maps are generated from SHP data which is downloadable for free from the government's official website. The naming of soil classification to the determining of the sub-group levels are conformed to the Soil Taxonomy (Soil Survey Staff, 1990).

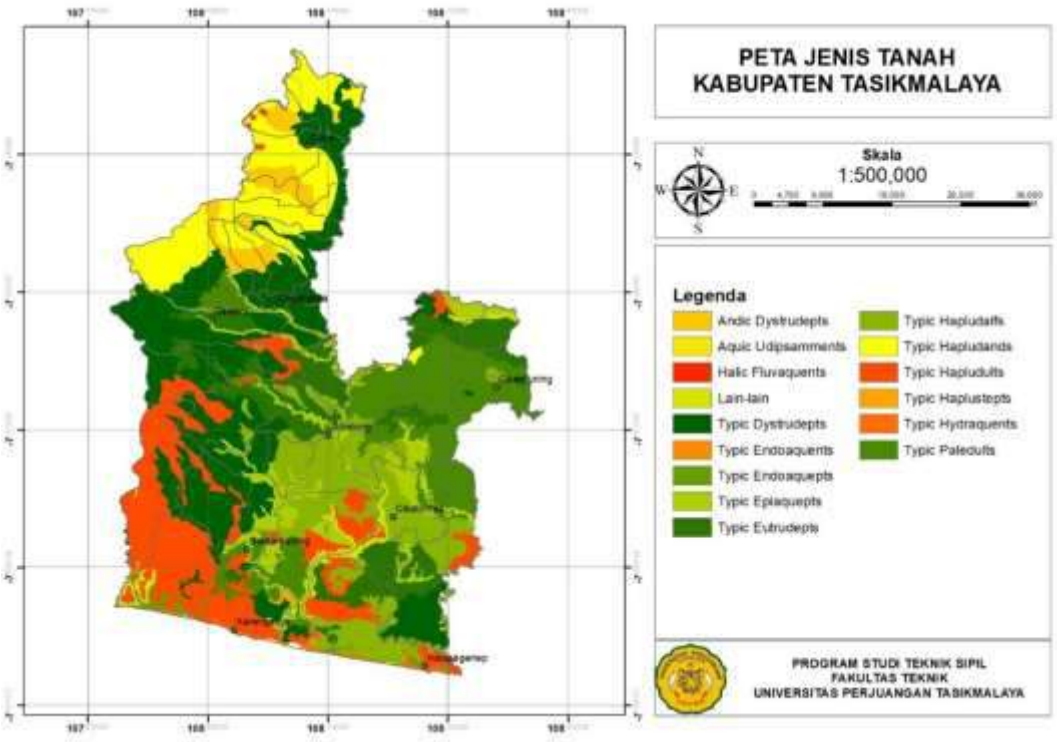

Figure 4. Soil types map of Tasikmalaya regency

To ease the scoring process of the soil types map, the distribution of soil types in Tasikmalaya Regency was classified, in accordance to the National soil classification system, into 6 soil types namely, Alluvial, Brown Forrest, Andosol, Red-yellow Podsolik, Latosol and Regosol. The soil types map scoring is based on Table 5.

4. Land Slope

The land slope conditions in Tasikmalaya Regency are respectively: Very Steep (> 40 %) of 1.39% of Tasikmalaya Regency area, Slightly Steep (25 % - 40 %) of 25.35 %, Steep (15 % - 25 %) of 27.11%, Sloping (8% - 15%) of 13.27 %, and Flat (0% - 8%) of 32.87% of Tasikmalaya Regency area. From the slope data, it is readily apparent that most of the Tasikmalaya Regency's landscape is dominated by flat to slightly steep surfaces. Areas with fairly high slopes can produce landslides. The scoring for the slope map is based on Table 3.

ISSN 2774-6011 print
2774-6348 online

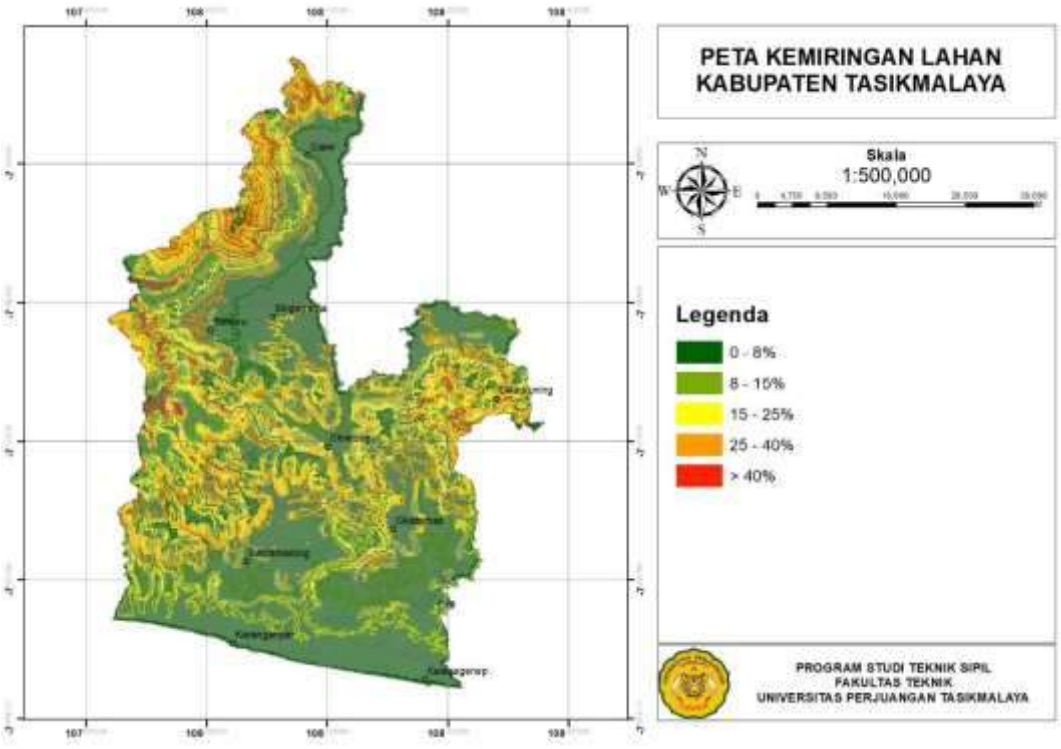

Figure 5. Land slope map of Tasikmalaya regency

5. Land Cover

Land cover within an area is closely related to economic conditions and the area's demographic. Based on the digitized land use map of Tasikmalaya Regency, five types of land cover were obtained, namely: forests, settlements, plantations, rice fields/agricultural areas and embankments (Figure 6). Based on the land cover map, the Tasikmalaya Regency area is dominated by dry mixed agricultural areas and secondary dry land forests. Dry land agriculture is generally in the form of open/empty lands which are usually cultivated during rainy seasons and left empty during dry seasons. Such a condition is very vulnerable to landslides in the event of rainfall on empty areas/areas with no vegetation to absorb water. The weighting/scoring of the land cover types map is based on Table 4.

ISSN 2774-6011 print
2774-6348 online

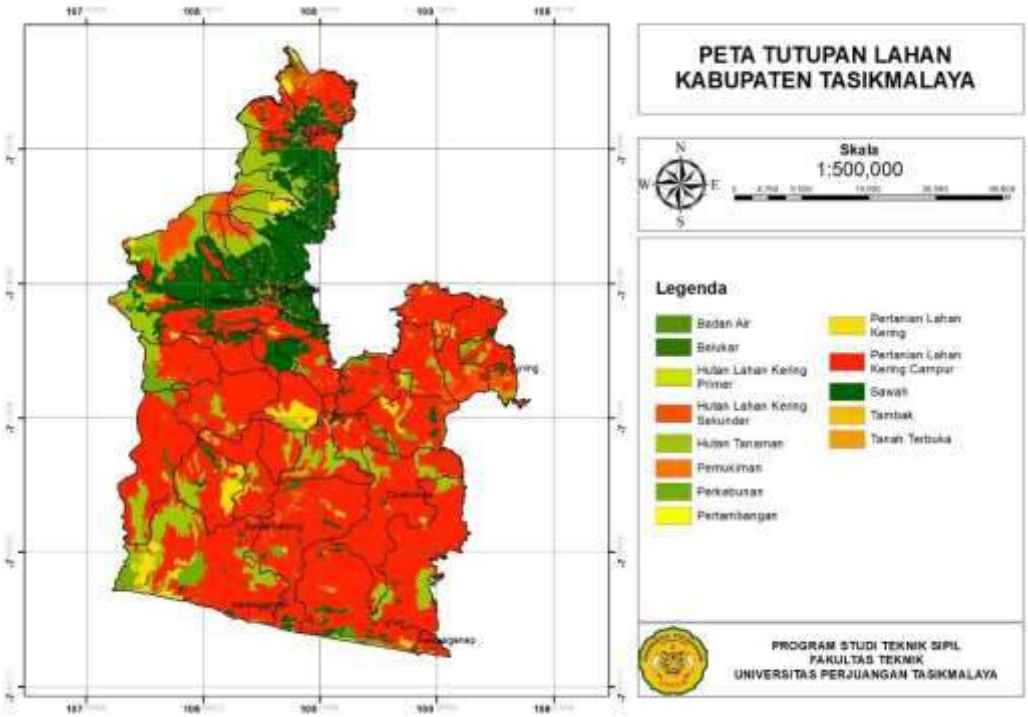

Figure 6. Land Cover Map of Tasikmalaya Regency

WebGIS Design for Landslide Disasters and Ground Movements That are Accessible to the Community

1. Landslide vulnerability and Ground Movement Maps of Tasikmalaya Regency

Estimation of landslide-prone areas was carried out using an estimation model sourced from the Research Center for Research and Development in 2004. Based on this model, the parameters used to estimate landslide-prone areas include Soil Type, Land Cover, Rock Type, Rainfall, and Land Slope. All of these parameters are classified based on their scores and weighted according to their respective contributions and subsequently processed. Based on the analysis of five landslide vulnerability parameters using the Puslittanak Landslide Vulnerability Estimation model in 2004, four landslide susceptibility criteria were obtained, namely Low, Medium, High and Very High. In the 2004 Puslittanak Landslide Hazard Estimation model, the rainfall factor was weighted at 30%, the rock type, land slope and land cover type was at 20%, while the soil type factor was at 10%.

Landslide Hazard Map and ground movement of Tasikmalaya Regency were obtained by combining (overlaying) five parameter maps and then calculating them. The results are then classified based on vulnerability levels. The results of this classification are shown in Figure 7.

ISSN 2774-6011 print
2774-6348 online

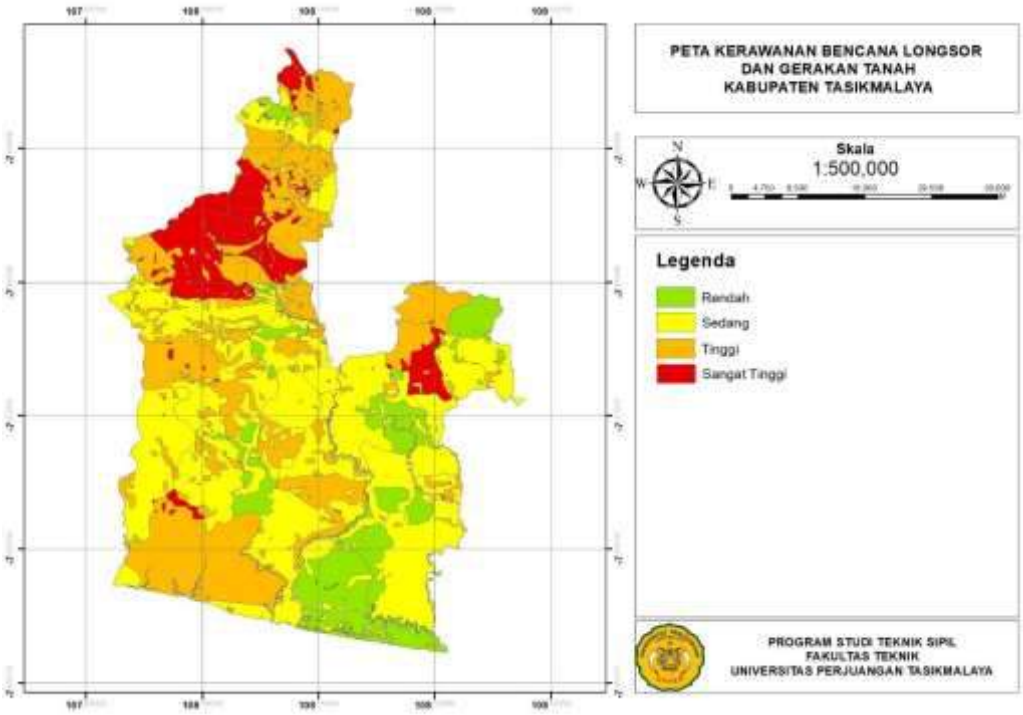

Figure 7. Landslide vulnerability and ground movement map of Tasikmalaya regency.

Based on the map, the Tasikmalaya Regency area generally has moderate to high levels of landslide and ground movement vulnerability. This needs to be watched out for because Tasikmalaya Regency has a high rainfall intensity. Generally, landslides and ground movements occur in areas that have high rainfall intensity, high land slope and land covers in the form of vacant lands, rice fields or grasslands that cannot hold water.

2. WebGIS design accessible to the public

WebGIS contains various information about landslides and ground movements in Tasikmalaya Regency that can be accessed by the public. The front page of this WebGIS can be seen in Figure 8.

ISSN 2774-6011 print
2774-6348 online

Figure 8. Front View of WeGIS Landslide Disaster and ground movement of Tasikmalaya Regency

WebGIS is still in a development stage and open to future improvements. Information obtainable from WebGIS includes:

1. Locations where landslides and ground movements occur every year, which are displayed on Google Maps which was integrated into WebGIS.

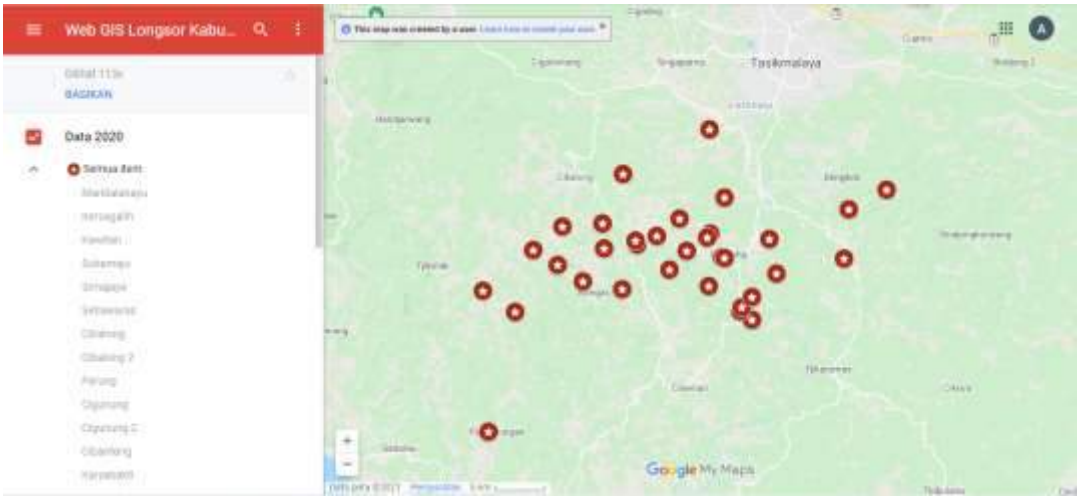

Figure 9. The location of the landslide events and ground movement in Tasikmalaya regency on the year of 2020

2. Locations of Landslide Disasters and Ground Movements in Tasikmalaya Regency throughout 2020.
3. Landslide Vulnerability and Ground Movement map of Tasikmalaya Regency throughout 2020.
4. Landslide Disaster Mitigation Poster.

ISSN 2774-6011 print
2774-6348 online

CONCLUSION

This community service activity aims to create a landslide vulnerability and ground movement map using an estimation model sourced from the Research Center for Research and Development in 2004 based on the scoring of five parameters, namely rainfall map, rock type map, land slope map, land cover map, and soil type map. Based on this weighting, Tasikmalaya Regency was divided into 4 criteria of landslide susceptibility, namely Low, Medium, High and Very High. After the landslide vulnerability map was compiled, the next activity was to create a WebGIS that can display various geographic information of landslides and ground movements that can be accessed by the public. In addition, the WebGIS also contained posters concerning mitigation for landslides and ground movements.

ACKNOWLEDGEMENT

The author would like to express the deepest gratitude to the Perjuangan University Research and Community Service Institute for facilitating the implementation of this community service activity.

REFERENCES

Aditya, T. (2010). *Visualisasi Risiko Bencana di Atas Peta*. Yogyakarta: Fakultas Teknik Geodesi Universitas Gadjah Mada.

Alhasanah. (2006). Pemetaan dan Analisis Daerah Rawan Longsor serta Upaya Mitigasinya menggunakan Sistem Informasi Geografis (Studi Kasus Kecamatan Sumedang Utara dan Sumedang Selatan, Kabupaten Sumedang, Provinsi Jawa Barat). Institut Pertanian Bogor.

Faizana, F., Nugraha, A. L., & Yuwono, B. D. (2015). Risiko Bencana Tanah Longsor Kota Semarang. *Jurnal Geodesi Undip*, 4(1), 223–234. https://ejournal3.undip.ac.id/index.php/geodesi/article/view/7669

Pusat Penelitian dan Pengembangan Tanah dan Agroklimat (Puslittanak). (2004). Laporan Akhir Pengkajian Potensi Bencana Kekeringan, Banjir dan Longsor di Kawasan Satuan Wilayah Sunai Citarum-Ciliwung, Jawa Barat Bagian Barat Berbasis Sistem Informasi Geografi. Bogor.

Noor, D. (2014). *Pengantar Mitigasi Bencana Geologi*. Yogyakarta: Deepublish.

Rahmad, R., Suib, S., & Nurman, A. (2018). Aplikasi SIG Untuk Pemetaan Tingkat Ancaman Longsor Di Kecamatan Sibolangit, Kabupaten Deli Serdang, Sumatera Utara. *Majalah Geografi Indonesia*, 32(1). https://doi.org/10.22146/mgi.31882

Z. Zakaria. (2010). Model Starlet, suatu Usula untuk Mitigasi Bencana Longsor dengan Pendekatan Genetika Wilayah (Studi Kasus : Longsoran Citatah , Padalarang, Jawa). *Jurnal Geologi Indonesia*, 5(2), 93–11.

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 40-53, 2021
ISSN 2774-6011 print
2774-6348 online

Original Title:
Pemetaan Daerah Resiko Bencana Longsor dan Gerakan Tanah Berbasis SIG untuk Menunjang Kegiatan Mitigasi Bencana (Studi Kasus : Kabupaten Tasikmalaya)

Abstrak. Kabupaten Tasikmalaya merupakan daerah yang rawan bencana longsor dan gerakan tanah. Tersedianya informasi yang lengkap dan akurat dalam pengendalian pemanfaatan lahan di kawasan rawan bencana longsor dan gerakan tanah dalam pengembangan suatu wilayah menjadi hal yang sangat penting dalam meminimalisir adanya korban jiwa dan kerugian-kerugian baik fisik, sosial maupun ekonomi. Informasi tersebut harus disebarkan kepada masyarakat sebagai sistem peringatan dini dalam upaya mitigasi bencana. Identifikasi karakteristik daerah rawan longsor dan gerakan tanah diperlukan sebuah pemetaan risiko kawasan rawan longsor dan gerakan tanah dalam upaya mitigasi bencana dapat dilakukan menggunakan Sistem Informasi Geografis (SIG). Kegiatan pemetaan ini dilakukan dengan menggunakan metode pengumpulan data-data digital dari lima faktor pengontrol kerawanan bencana longsor dan gerakan tanah, yaitu curah hujan, jenis batuan, jenis tanah, tutupan lahan dan kemiringan lereng. Analisis dilanjutkan dengan melakukan pembobotan faktor-faktor pengontrol longsor dan gerakan tanah selanjutnya menumpangtindihkan (*overlaying*) kelima peta faktor pengontrol (dengan nilai bobot masing-masing) sehingga menghasilkan peta tingkat kerawanan bencana longsor dan gerakan tanah yang diinput ke WebGIS. Peta ini kemudian dapat dimanfaatkan oleh pemerintah daerah dan masyarakat sebagai media informasi dalam menunjang kegiatan mitigasi bencana.

Kata kunci: Faktor pengontrol, longsor, kerawanan, WebGIS, mitigasi bencana

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 54-63, 2021
ISSN 2774-6011 print
2774-6348 online

"BeDiL" Learning Media Training in The New Normality Era

Yohanna Nirmalasari, Dhatu Sitaresmi, dan Vincentius Valiandy Jiuangga*

Mandarin Education Study Program, Ma Chung University, Jl. Villa Puncak Tidar N-1, Malang, Indonesia, 65151

Correspondence: Vincentius Valiandy J. (vincentius.valiandy@machung.ac.id)
Received: *25 August 2021* – Revised: *31 October 2021* - Accepted: *2 November 2021*

Abstract. Online learning is a new phenomenon for educators. This requires education actors, such as educators, education staff, governments, students, and even parents of students to be able to work together in building interactive learning. Online learning is a learning method/way that can motivate students to learn more and achieve learning objectives. However, not all educators can adapt quickly, especially for educators who work in the field at the front lines. This can happen because, over the years, educators have been accustomed to face-to-face or offline teaching models instead of a virtually face-to-face or online model. When learning is carried out online, this becomes a challenge for educators where they have to learn many new things such as the media platforms, new presentation methods, or adapted teaching strategies so that learning can be done effectively. Moreover, an educator is a wheel in learning. Therefore, training on the design of a learning media, especially in the face of this new normal era, is crucial to do. This training activity is carried out using the learning-by-doing method. This method was chosen because the training activities were carried out in a guided manner. Based on the training activities two results can be obtained. First, the training related to the BeDiL learning media has been carried out smoothly. Second, participants can make BeDiL learning media in the form of posters that can be classified into two, namely complete BeDiL posters and incomplete BeDiL posters.

Keywords: learning media, new normal era, *bedil*, poster

Citation Format: Nirmalasari, Y., Sitaresmi, D., & Jiuangga, V.V. (2021). "BeDiL" Learning Media Training in The New Normality Era. *Journal of Community Practice and Social Welfare*, 1(2), 54-63.

ISSN 2774-6011 print
2774-6348 online

INTRODUCTION

During the pandemic period every learning process must be done online. Some institutions or schools are doing an online learning process fully and some are not. When a face-to-face learning process is not fully applied; thus, educators have to implement both vis-à-vis and virtual or so-called blended learning. However, blended learning will not change the essence on the learning process.

Learning is a process that leads someone to comprehend. Dewi (2020) stated that online learning makes students more flexible to arrange their time and place to study. Based on Dewi's statement it can be concluded that students can plan study around the rest of their day. Therefore, the online learning process will engage more learning components.

Learning has many components, including teachers, students, curriculum, education staff, media, and teaching materials. All of these components must run in parallel so that they both have one goal, namely to achieve learning objectives. However, this is certainly a new challenge when learning is run online. Educators have been accustomed to situations and conditions in offline learning or face-to-face learning but have to change to online. Therefore, not all educators, especially teachers, can adapt directly.

Educators are the main component in the learning process. According to Fitria et al., (2019), the teacher is the key holder regarding the attractiveness and effectiveness of a learning process so that a teacher must be able to liven up the classroom atmosphere and can improve the personality of students. The teacher can also be likened to a wheel that will accelerate the learning process. When the wheels are not good, then a car will not be able to run well. Similarly, in learning when the teacher is not ready, it will certainly have a negative impact on the learning process and will certainly be felt by students.

A teacher has to prepare some materials such as method, material media and a strategy to facilitate students to achieve the purpose of learning. A teacher is called a professional teacher when he has prepared all learning materials. According to Sa'bani (2017), a professional teacher has to accomplish their competency proficiency for example: plan, execute and evaluate every learning process. Those methods are still implemented also for online learning. Not all teachers can directly adapt to prepare all components of learning. This is in accordance with the opinion expressed by Ayuni et al, in her study (2020) described that there are still many teachers who are not yet proficient and not ready to apply technology during the pandemic even though those are also important things.

ISSN 2774-6011 print
2774-6348 online

In addition to the problems that have been stated previously, Jamaluddin et al. (2020) in his research also found that there are obstacles in the form of an unstable internet network (23%) and a limited mobile or internet data (21%) which are two major aspects that interfere with the online learning process. It means that problems related to media technology or networks become a problem that can hinder the learning process. Based on this opinion, it can be restated that in online learning of course there are obstacles that occur, but a teacher who becomes the wheel of the learning process must have media that is easy to access and complete so that it can make the learning process become easier for students to understand the material. Therefore, a service activity is needed in the form of training related to learning media that can support teachers in the online learning process, one of which is training provided to teachers or educators at Elim Christian Vocational School.

PROBLEM

The main problems for partners to solve are problems in the field of the pedagogical ability of the teaching staff or educators. This problem requires the existence of media training that helps students to take part in online learning or blended learning in the new normal era. In detail, these problems can be described as follows.

1. There has never been an internal training that can improve the pedagogical abilities of educators.
2. not all educators know the learning media that can be used when learning in the new normal.

METHOD OF IMPLEMENTATION

The service activity was carried out in four steps. First of all, conducting initial observations to analyse the needs of the SMK Elim Malang. Second, preparing training which included preparation of materials and modules. Then, carrying out the training in this step instructors applied learning by doing method. The last, measuring the success of training materials through reviewing the results of the BeDil poster.

In the early step, Abdimas team carried out initial observations to analyze the needs of developing effective learning method in Elim Christian Vocational School Malang. Based on these stages, it was found that there were obstacles which related to the use of learning media for the implementation of blended learning. In addition, another obstacles that arised, There were many students who were not actively participating in face-to-face meetings

ISSN 2774-6011 print
2774-6348 online

because there are quota constraints. Therefore, in this service, a learning media was developed that still required students to be active without using a large quota.

The second step, related to material preparation. At this stage the service team discusses the material that will be delivered during the training. After that, the research team had their respective responsibilities to compile the material that has been designed.

In the third stage, namely the implementation with the learning by doing method. This method was chosen because the training activities were carried out in a guided manner. There are two stages in this service activity such as delivery of the materials and guided training. *First*, regarding the delivery of the material, training activity is divided into three sessions, the delivery of materials related to (1) blended learning and kahoot games, (2) Padlet material and (3) word wall material and media for making BeDiL using Canva. BeDiL is an abbreviation of Based Digital Learning, so BeDiL learning media is a form of digitally packaged media development for the learning process in the form of a poster using a smart code or barcode. Second is guided training. This training is carried out by asking the trainees to prepare BeDiL learning media. According to Sa'bani (2017), training is a learning process that emphasizes practice rather than theory carried out by a person or group that aims to improve ability in one or several specific skills. Based on this opinion, service activities in the form of training are carried out in detail and slowly so that the material can be optimally delivered. This activity begins by asking the educators to determine the SK and KD that will be used as training. After that, the trainees were asked to change all the learning media used in the form of posters. This poster is a form of Digital Learning-Based learning media that can make it easier for teachers to deliver learning materials.

In the final step, called the stage of measuring the success of the training material. The team collected all the results of the posters as well as the results of the pre-test and post-test. After that, the team would make conclusions about the implementation of the training.

RESULTS AND DISCUSSION

Training activities which are related to media, strategies, and methods are indispensable in online learning, especially media training. This training activity was held on May 6, 2021, and only focused on media training because media is a very important component in online learning. This is in accordance with the opinion expressed by Sunzuphy (2011) that the teaching and learning process will be effective and efficient if it is supported by the availability of supporting media.

ISSN 2774-6011 print
2774-6348 online

The BeDiL learning media training activity was planned to be held for two days, but due to Corona Pandemic the teaching and learning activities were suggested to be implemented in online learning, so this activity was done in a day only. The training implementation activities were started at 08.00 WIB until 12.30 WIB and divided into 4 sessions: material 1, material 2, material 3, and making the learning media named BeDiL in the form of posters. This training activity was attended by 9 educators and education staff at Elim Christian Vocational School in Malang. There were some educators who could not participate in this activity because they had something more important to do. However, this condition did not change the spirit of the other educators.

Based on the training activities that had been done, the participants were very happy and felt helped by this training activity. Many participants succeeded in making BeDiL learning media, in the form of posters. The BeDiL poster or Digital Learning-Based poster was a poster which was created to help teachers to deliver learning materials as well as exercises and other additional materials such as tests, exercises, or games.

The BeDiL learning media is a learning media in the form of posters that use smart codes. This smart code or commonly known as a barcode will help students to access learning materials online. Through the existence of smart code that is intended to access many things, it can help students to save their phone data, especially when they are studying independently. This is very useful because not all students have much phone data that will take huge amount of data when they are doing online meetings. Therefore, with this poster, face-to-face online meetings can be shortened, and the rest of the time can be used to access posters independently. The results of these posters can be classified into two: complete posters and incomplete posters.

First of all, the full BeDiL poster. The complete BeDiL poster is a poster that consists of main material, online learning media, assignments, and games. This is in accordance with the opinion expressed by Mukti (2018) that creating a fun learning atmosphere in the classroom with quizzes, funny questions, humour and making presentation materials are very important. So, that is presented through smart coded posters or also known as BeDiL media. The following is an example of a poster that has been made and its presentation.

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 54-63, 2021
ISSN 2774-6011 print
2774-6348 online

Figure 1. Incomplete Poster 1

Figure 2. Complete Poster 2

Posters 1 and 2 are examples of posters that are included in the complete BeDiL learning media because they already cover the scope of learning, such as materials, media, and evaluation. In poster 1 it can be seen that the participants used the training topic as a learning topic even though the task actually asked was to make posters according to their respective teaching fields. The poster is complete because it already contains training materials, namely about padlets and canvas and includes exercises and assignments made in kahoot and wordwall. Furthermore, in poster 2 it appears that this poster is the most complete and appropriate poster because it already contains the title of the lesson, namely Knowing Computer Systems, and contains learning media through padlets, and learning evaluations through kahoot. Not only that, but participants also added pearls of wisdom at the bottom of the poster. This is a positive example because it can remind all educators that although learning is carried out boldly, it must also be able to instill good character in students. Through this poster, of course, students will more easily understand the material. This is in accordance with the opinion expressed by Dewi (2020) that the creativity of teachers to develop teacher creativity in utilizing alternative learning can help students.

Second, the BeDiL poster is incomplete. Incomplete BeDiL posters are posters that are compiled by not including learning materials, exercises in posters, or posters that cannot explain learning clearly. Here's an example of a poster and a discussion.

ISSN 2774-6011 print
2774-6348 online

Figure 3. Complete Poster 1

Figure 4. Incomplete Poster 2

Posters 3 and 4 are examples of incomplete posters. On poster 3 it appears that the title of learning already exists is about the text of the procedure. Judging from its use, it can certainly be known that this poster is a medium of English learning.

However, the poster does not contain information that can be understood during self-learning by learners because there is no title of each smart code or barcode that exists. So, the learners have to check each context when they have to see the material or have to do the task. Furthermore, poster 4 is also an incomplete poster because it does not contain learning materials.

Furthermore, poster 4 is also an incomplete poster because it does not contain learning materials. The poster already contains the title of learning that is about theatre, but there is no title of material for example about understanding the elements in the theatre or other material titles. In addition, the poster contains only two smart codes that all refer to the exercise.

It indicates that the trainee has not added a link or material link to the poster. If the components in BeDiL posters are incomplete, then the purpose of making BeDiL posters cannot be conveyed. This means that when there is additional material or there are other learning media such as videos, then educators or teachers must send the link again. It's certainly not a practical thing. Whereas a learning medium must make the learning process of students, the teaching and learning process becomes easier and more interesting so that students can understand and understand the lesson easily, learning efficiency increases, motivation increases, and provides a thorough learning experience (Dwijayani, 2019).

ISSN 2774-6011 print
2774-6348 online

However, although BeDiL learning media in the form of posters made there are less or still incomplete this is a good start. This is because the trainees learn new things. They are familiar with learning media such as kahoot, padlet, and also wordwall that can help them in online learning. In addition, trainees can also learn to create posters and know how to scan smart code or create smart codes online.

CONCLUSION

Based on the training activities of making BeDiL learning media that have been carried out can be obtained two conclusions, namely related to the course of training and training results. First, related to the course of training can be known that the training goes well, and the training material can be conveyed well to the trainees. It is seen in the final result of making BeDiL learning media in the form of posters made. Second, related to the results of the training, posters can be known that all trainees managed to make posters. The poster can be classified into two, namely the complete BeDiL poster and the incomplete BeDiL poster.

ACKNOWLEDGEMENT

The authors Thanked Ma Chung University for providing the opportunity to carry out devotional activities and provide us full financial support. In addition, the author also thanked to the principal of Elim Christian Vocational School, Mr. Jonar Situmorang who had deigned to hold training activities, as well as to educators and education personnel who had taken part in the implementation of devotional activities in the form of this training so that it could run smoothly.

REFERENCES

Ayuni, D., Marini, T., Fauziddin, M., & Pahrul, Y. (2020). Kesiapan guru TK menghadapi pembelajaran daring masa pandemi COVID 19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *5*(1), 414. https://doi.org/10.31004/obsesi.v5i1.579

Dewi, W. A. F. (2020). Dampak COVID-19 terhadap implementasi pembelajaran daring di sekolah dasar. *Edukatif : Jurnal Ilmu Pendidikan*, *2*(1), 55–61. https://doi.org/10.31004/edukatif.v2i1.89

Dwijayani, N. M. (2019). Development of circle learning media to improve student learning outcomes. *Journal of Physics: Conference Series*, *1321*(2), 171–187. https://doi.org/10.1088/1742-6596/1321/2/022099

Fitria, H., Kristiawan, M., & Rahmat, N. (2019). Upaya Meningkatkan Kompetensi Guru Melalui Pelatihan Penelitian Tindakan Kelas. *Abdimas Unwahas*, *4*(1), 14–25. https://doi.org/10.31942/abd.v4i1.2690

ISSN 2774-6011 print
2774-6348 online

Jamaluddin, D., Ratnasih, T., Gunawan, H., & Paujiah, E. (2020). Pembelajaran daring masa pandemik COVID-19 pada calon guru: Hambatan, solusi dan proyeksi. *Karya Tulis Ilmiah UIN Sunan Gunung Djati Bandung*, 1–10. http://digilib.uinsgd.ac.id/30518/

Mukti, Y. (2018). Pelatihan maintance komputer SMAN Pagar Gunung. *Ngabdimas*, *1*(1), 47–51. https://doi.org/10.36050/ngabdimas.v1i1.126

Sa'bani, F. (2017). Peningkatan kompetensi guru dalam menyusun RPP melalui kegiatan pelatihan pada MTs Muhammadiyah Wonosari. *Jurnal Pendidikan Madrasah: (Journal of Madrasah Education)*, *2*(1), 13–22. http://ejournal.uin-suka.ac.id/tarbiyah/index.php/JPM/article/view/1429%0Ainternal-pdf://0.0.2.29/1429.html

Sunzuphy, C. (2011). *Media pembelajaran*. https://www.academia.edu/2463128/Media_pembelajaran?from=cover_page

Journal of Community Practice and Social Welfare
Vol. 01, No. 02, pp. 54-63, 2021
ISSN 2774-6011 print
2774-6348 online

Original Title:
Pelatihan Media Pembelajaran "BEDIL" Era Kenormalan Baru di SMK Kristen Elim Malang

Abstrak. Pembelajaran daring menjadi sebuah situasi dan kondisi yang baru bagi para pelaku pendidikan. Hal ini menuntut para pelaku pendidikan baik tenaga pendidik, tenaga kependidikan, pemerintah, peserta didik, bahkan orang tua peserta didik untuk dapat bekerja sama dalam membangun sebuah pembelajaran yang hidup. Pembelajaran yang hidup merupakan pembelajaran yang dapat mengaktifkan peserta didik dan dapat mencapai tujuan pembelajaran. Namun, tidak semua pelaku pendidikan dapat beradaptasi secara mudah khususnya bagi tenaga pendidik yang bekerja di lapangan. Hal ini bisa terjadi karena selama bertahun-tahun para tenaga pendidik terbiasa mengajar dalam situasi dan kondisi yang tatap muka atau luring bukan tatap maya. Saat pembelajaran dilaksanakan secara tatap maya atau daring maka hal ini menjadi tantangan sendiri bagi tenaga pendidik di mana mereka harus belajar banyak hal baru seperti media pembelajaran, metode, atau pun stratagi mengajar sehingga pembelajaran tetap dapat berjalan. Apalagi seorang tenaga pendidik merupakan roda dalam pembelajaran. Oleh sebab itu, pelatihan tentang pembuatan media pembelajaran khususnya dalam menghadapi era kenormalan baru ini sangat penting untuk dilakukan. Kegiatan pelatihan ini dilaksanakan dengan metode *learning by doing.* Metode ini dipilih karena kegiatan pelatihan dilakukan secara terbimbing. Berdasarkan kegiatan pelatihan yang sudah dilakukan dapat diperoleh dua hasil, yakni terkait keberhasilan pelatihan dan akhir pelatihan berupa poster BeDiL. *Pertama,* pelatihan terkait media pembelajaran BeDiL sudah berhasil dilaksanakan dengan lancar. *Kedua,* para peserta dapat membuat media pembelajaran BeDiL berupa poster yang dapat diklasifikasi menjadi dua, yakni poster BeDiL lengkap dan poster BeDiL tidak lengkap.

Kata kunci: Media pembelajaran, era kenormalan baru, bedil, poster

LPPM Ma Chung
RnD Building,
Ground Floor,
Ma Chung University
Jalan Villa Puncak Tidar N-1, Malang
+62-341-550 171 Ext. 4010
jacips@machung.ac.id
lppm@machung.ac.id

9 772774 601004
p-ISSN : 2774-6011

9 772774 634002
e-ISSN : 2774-6348