Indonesian Journal of Community Engagement
Jurnal Pengabdian kepada Masyarakat
Vol. 6, No. 1, Maret 2020, Hal. 01 – 08
DOI: http://doi.org/ 10.22146/jpkm.48581

KKN-PPM: Improvement of Creativity Processing Purple Uwi into Purple Uwi Chips

Sandy Vikki Ariyanto[1]* and Imron Rosyadi NR[1]

[1]Department of Informatics Engineering, Faculty of Engineering, University of Madura, Tlanakan, Pamekasan, East Java, Indonesia

Submitted: 7 Agustus 2019 ; Revised: 4 January 2020; Accepted: 5 February 2020

Keywords:
Liquid fertilizer
Offline and online marketing
Production processing
Water infiltration

Abstrak Based on observations by DPL and KKN students of Madura University, Blaban Village is located on a plateau of rocks that make it difficult to grow plants. The soil condition of Blaban village is barren and dry during the dry season, during the rainy season the soil is cracked so that it needs water absorption to collect rainwater in the soil and improve the structure of the dry soil during the dry season. With a combination of science from soil structure (Geophysical Science), water supply in the soil (Geophysical Science), liquid fertilizer (Agricultural Science), product processing (Industrial Engineering), quality and quantity management (Industrial Engineering and Management Science), financial management (Economics), marketing management (Industrial and Economic Engineering) even taking care of business licenses (Legal and Administrative Sciences), and online sales using applications (Informatics Engineering). In order to maximize the processing of purple uwi into purple uwi chips in Blaban Village, the initial planting of purple uwi to processing as well as selling purple uwi chips are done through offline and online methods. The results obtained are optimizing the sale of purple uwi crops into purple uwi chips, which has more demand by all consumers in various regions.

1. INTRODUCTION

Economic growth is different in each region, especially in the Madura Island region which has four districts, one of which is the Pamekasan Regency. Pamekasan Regency is geographically located between 113˚19'–113˚58' BT and 6˚51'–7˚31' LS, 125 km from Surabaya. Administratively, the area of Pamekasan Regency is 79,230 hectares or 792.3 km^2, consisting of 13 districts, 11 subdistricts, and 178 villages. Pamekasan Regency has five regional potentials, namely in the agriculture, plantation, fishery and marine, livestock, and creative industries sectors. From these potentials, one of the sectors that have rapid development is agriculture. As an appreciation of this success, the government awarded the Pamekasan Regency in the form of the Satya Lencana Wirakaya Agriculture in 2011. The most important agricultural commodities in Pamekasan Regency include food crops and horticulture.

Figure 1. Condition of soil structure in Blaban Village

ISSN 2460-9447 (print), ISSN 2541-5883 (online)

*Corresponding author : Sandy Vikki Ariyanto
[1]Department of Informatics Engineering, Faculty of Engineering, University of Madura, Jl Raya Panglegur Km. 3,5 Pamekasan 69317, Tlanakan, Pamekasan, East Java, Indonesia
Email: Sandy@unira.ac.id

Blaban Village is located on a plateau, so it is difficult to plant crops because of the steep land condition. The condition of Blaban Village is barren and dry during the dry season, meanwhile, during the rainy season the soil intensely crack in order to absorb water to collect rainwater in the soil and improve the structure of the dry soil along the dry season (Figure 1). Infertile soils, unreliable rainfall, and inadequate management of the natural resource base have led to yields reduction and increased risk of crop failure in most agricultural sectors of smallholder dry land in South Africa (Thierfelder & Wall, 2009).

The Blaban villagers are mostly farmers and a small portion of them are entrepreneurs, because in terms of the abundant natural resources, hilly villages with sufficient water sources, people are less familiar with applied knowledge and technology in agriculture.

Based on the observation by the KKN-PPM team in the Blaban Village including agriculture, these communities generally farm corn, purple uwi, and onions. However, 80 percent of the people in Blaban plant Purple Uwi, while corn 10 percent, 9 percent more onions, and 1 percent others (Figure 2). From the data, the Blaban Villagers took Purple Uwi to be processed as the main life supporter (income).

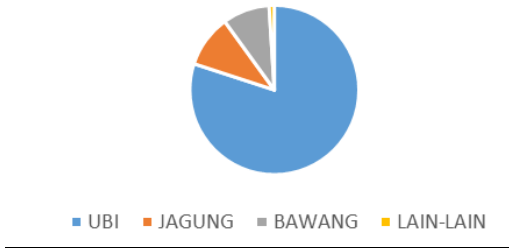

Figure 2. Results of agriculture in Blaban Village

Cassava or coconut yam, Purple Uwi, "yam" (*Dioscorea alata L.*), is a specific tuber crop of leak land. There are various forms of the yam, namely round, long, and resemble branches or fingers. Although there are many types of labia sweet potato, it can be clearly distinguished from the color of the sweet potato flesh, namely red/purple sweet potato (violet) and white sweet potato. As a food, labia yam has a fairly good nutritional composition. (Umar, 2010). The types of Purple Uwi planted include white Purple Uwi and black Purple Uwi. When planting Purple Uwi these villagers usually use makeshift fertilizer causing the growth of Purple Uwi is not optimal. Therefore, knowledge of liquid fertilizer is required.

After the harvest day, the Blaban villagers sell the harvest as fresh Purple Uwi and of course at a cheap cost. But after KKN-PPM Madura University came and present their programs and activities in there, Blaban villagers can improve their income by processing the purple uwi into purple uwi chips before they sell them. The process of making purple uwi chips is by cutting them into thin shapes and cleaning them, after that they are dried directly using sunlight for 3 days. This equipment limitation certainly impedes production performance and causes less number of products produced and still requires considerable time for production. So, it requires equipment that will simplify the production and shorten the production time.

On the other hand, production sites and equipment are generally doubled as household equipment, making it very difficult to disentangle production funding, so Blaban Village business owners cannot calculate actual production costs. This makes financial analysis as a form of evaluation and business development is difficult to do. Therefore, knowledge of the financial system is needed.

In terms of sales, Blaban villagers still sell their purple uwi products at the nearest market, the nearest traditional shop, and the next village, so the sales still do not cover broadly, thus the typical purple uwi chips products of Blaban Village are still not well known. Therefore, it requires an education on offline sales management that covers local and regional and requires online sales management to cover local, regional, national, as well as international market.

With the addition of flavors, the number of products, and attractive packaging, it becomes sufficient capital for business owners to increase market segmentation and expansion by marketing manually and online. Selling online will bring this business closer to consumers and bring maximum profit.

With the scientific combination of soil structure (Geophysical Science), water supply in the soil (Geophysical Science), liquid fertilizer (Agricultural Science), product processing (Industrial Engineering Science), quality and quantity management (Industrial Engineering and Management Science), management finance (Economics), marketing management (Industrial Engineering and Economics) even taking care of the Ministry of Health's permit or label from BPOM (Legal and Administrative Sciences), and online sales using web and applications (Informatics Engineering), it can maximize the processing of purple uwi into purple uwi chips in Blaban Village. From the initial planting of purple uwi to process purple uwi chips and even selling purple uwi chips through offline and online. This article is a summary of KKN PPM implementation activities.

Based on the results of the explanation above, the problems faced by Blaban villagers are related to the following aspects such as:

1. Aspects of soil structure and water supply in the soil, includes:
   a. Soil structure in Blaban Village is arid due to them not using technology for wet soil structures such as water catchment.

b. The availability of water in Blaban Village is still lacking because it does not use groundwater storage technology such as water catchment.
c. The absence of pests that fertilize the soil in Blaban Village due to them not using the biopore technology.
d. The lack of knowledge in Blaban Village about the structure of the soil can be fertile and contains the availability of water in the soil.

2. Liquid fertilizer aspects, including:
   a. Lack of knowledge about liquid fertilizer resulting in the soil structure for planting become not optimal in soil fertility.
   b. Lack of knowledge about making liquid fertilizer so that the Blaban people still buy ready-made fertilizer.
3. Product processing and production aspects, including:
   a. The equipment used is still simple or traditional, namely using a knife to cut, instead of using appropriate technology such as a semi-automatic cutting machine (chips cutting machine).
   b. Drying using the sun with the required amount of drying time of around 3 days. Lack of the use of appropriate technology such as food drying ovens.
   c. Purple uwi chips are still fried using the frying pan instead of using appropriate technology such as vacuum frying.
   d. The equipment for draining oil still using a paper in a container instead of utilizing appropriate technology for the spinner machine (oil drainer).
   e. Equipment for packaging using thin plastic that can heat up when the sun wears, the packaging is an identical danger instead of using a product packaging device (hand-sealer) which can withstand the effects of air.
   f. There is no arrangement of space and production equipment so that the processing of purple uwi chips cannot be carried out effectively.
   g. There is no arrangement of equipment used in production is not distinguished from equipment for households, so the production costs are difficult to describe.
   h. Lack of knowledge regarding variants of processed purple uwi chips products that are in demand by consumers.
4. Quality aspects, including:
   a. The use of oil-draining machines, making products not as durable as other industrial food products.
   b. The product is not packaged properly or is not attractive thereby reducing the value of the product. Packaging with food labels will increase consumer confidence in the products sold.
5. Financial management aspects, including business financial management, is mixed with household finance, so the business financial analysis is difficult to do.
6. Product management aspects, including lack of regulation and planning of raw material stock so that if the raw material runs out, this business will stop operating. In addition to the stock of raw materials, the finished product stock must also be considered to avoid lack of stock which results in less optimal benefits.
7. Marketing management aspects, including product marketing, is only done at the traditional market, the nearest traditional shop and the next village, therefore it does not cover the broader market. This results in the typical purple uwi chips products of Blaban Village are still not well known, and the limited number of products that cause the processed purple uwi chips products have not been marketed through stores or minimarkets and online media.

2. METHOD

3.1 Method of problem approach

The science and technology transfer process delivered by the Villager Teaching and Villagers Empowerment (KKN-PPM) Real Work Lecture Implementation Team will be carried out through several stages. The principle of the approach used is the knowledge, technology, and innovation will be received by Blaban village communities through the process of listening, understanding, trying, evaluating, accepting, trusting and implementing. Based on the series of processes, it is expected that knowledge, technology, and innovation can be accepted and adopted sustainably, the Blaban villagers can plan and analyze their business development, as well as to develop innovations both in the process and the result.

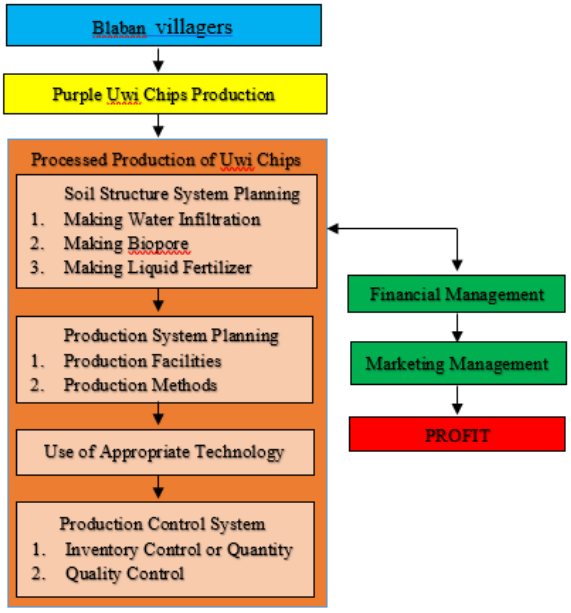

Figure 3. Framework for problem approaches

To support the success of the transfer of knowledge, technology, and innovation, the delivery can be done through counseling, discussion, practice, and mentoring. Broadly speaking, the problem approach process is carried out as shown in (Figure 3).

3.2 Plan of program activities

Based on the problem approach method described earlier, the planned Villagers Work and Villagers Empowerment (KKN-PPM) Work Lecture for the management of soil structure, purple uwi production, and marketing of processed purple uwi chips can be explained as follows:

1. Socializing the program to provide a clear picture of the goals and benefits of the program as well as the target of program outcomes to all parties directly involved in achieving the success of all activities.
2. Present activity plans details with the aim of the Blaban villagers to understand and play an active role in all coaching activities designed in this program. Provide training in making water and biopore infiltration as well as practicing on dry and barren soil structures and transferring knowledge about water and biopore infiltration.
3. Making liquid fertilizer and transferring knowledge about liquid fertilizer
4. Preparation of production management that serves as guidelines for implementation and business development. The planned activities for production management include:
   a. Arrangement of production space is accompanied by the addition and manufacture of production equipment needed to produce faster and better quality products.
   b. Planning the flow of processing activities that begin from the selection of materials until the product is ready to be packaged.
   c. Equipment maintenance is one of the important phases and must be well designed because damage to equipment will disrupt the production process and hamper business revenues.
   d. Inventory control and product quality that serves to maintain a balance between inputs, processes, and outputs of the production carried out.
5. Preparation of marketing programs to recognize characteristics and make the right decisions regarding the target market. At this stage, the Blaban villagers were also trained to use online media in marketing their products.
6. Recording, accounting, and evaluation of business finances, this phase is carried out on all business activities, both in terms of activities and cash flow must always be recorded properly. This phase is also used as a guide in monitoring and evaluating the course of the business

3.3 Contribution and participation of blaban village

Blaban villagers are currently active in managing the processed business from purple uwi with specifications for producing purple uwi chips. With the active villagers of Blaban Village, business facilities or infrastructure are available such as places, equipment, and labor (Blaban villagers), but have not met the business feasibility standard. Also, capital for business operations such as material procurement and labor costs is largely available, but its use has not been optimized so the production is less optimal.

Also, Blaban villagers participated in determining the main flow of purple uwi processing activities, from raw purple uwi to purple uwi in the desired shape (purple uwi chips) and ready to be cooked or fried. Some methods of processing have been carried out by Blaban villagers before, therefore the experience of Blaban villagers is used as input to determine the right type of purple uwi and its processing techniques.

3. Results and Discussion

3.1 Water infiltration

From the results of the study Victorianto, Qomariyah, & Sobriyah, 2014 it was found that the biopore hole was used to absorb rainwater and store it in the soil so that it could overcome the dry soil conditions during the dry season. Therefore the KKN-PPM team makes water containment (boipore hole) in Blaban village to overcome the drought.

Figure 4. The Process of Making Pipe Covers for Water Infiltration

The KKN-PPM team made water infiltration equipment using a simple tool, namely soil drilling. The making of ground drilling used iron bars and steel plates, which are then arranged in such a way as drilling using electric welding. This water infiltration uses iron, pipe measuring 89 mm, pipe cover 89 mm. Furthermore, the pipe cover is perforated using a drill tool (Figure 4).

Figure 5. Installation of water containment pipes in the field

The pipe size of 89 millimeters is installed with a minimum depth of 1 meter, but at the KKN-PPM Team location, the drilling could not reach the target depth due to the ground on this rock (Figure 5).

After making the water absorption equipment, the KKN-PPM team do socialization to the villagers and tries to find the location determined by the village head of Blaban. With this water absorption knowledge transfer, the KKN-PPM team hopes that all Blaban Village communities can apply it in every house and even every land owned per person. With this activity the drought in Blaban Village can be reduced.

After transferring water absorption knowledge, the KKN-PPM Team also transferred knowledge about organic fertilizer. This organic fertilizer is made through organic waste put into a pipe hole and awaited at least 1 month so that later it will become organic fertilizer. This organic fertilizer can minimize organic waste wasted in vain to be useful.

In this activity, the villagers are very enthusiastic to make water infiltration and organic fertilizer made from organic waste. Blaban villagers are very enthusiastic about water absorption and organic fertilizer activities because the villagers in Blaban need a lot of water so that the planting in Blaban Village is very fertile and good.

3.2 Liquid fertilizer

Liquid fertilizer functions to help root growth, physiology and reduce disease and damage to plants. The material for making liquid fertilizer are granulated sugar or drops, banana root, papaya root, bamboo root, papaya fruit, pineapple, sprouts, banana peel, water spinach, and coconut water.

This liquid fertilizer was made by chopping all those ingredients, which are then put into a blender, after smoothing all the ingredients are put into gallons, after that sugar is added, then the container is tightly closed, after that the mixture is stirred so that all ingredients are mixed and homogeneous, then allowed to stand for at least one week so that the fermentation process occurs. Next is the socialization of liquid fertilizer. The opportunity to make liquid fertilizer among the villagers is very large because the villagers still do not know the theory about the making, benefits, and application of liquid fertilizer. Making liquid fertilizer also has the opportunity to become a villager's business.

3.3 Processing of purple uwi chips production

The results showed that the Sambalado Chips Agroindustry business with the main raw material namely cassava had an R-C ratio of 3.62. Thus, the Balado chip processing business is worth the effort (R-C Ratio> 1) (Mardhiah & Alfarisyi, 2017). Purple uwi which has high cyanide acid (HCN) (> 96 ppm) (Leasa, Amanah, & Fatchiya, 2018). It is known that purple uwi has several benefits, namely relieving stomach acid, can help diet programs, and prevent cancer. So, the production of purple uwi plants is needed by various groups. However, in Indonesia, people rarely plant these plants, maybe because these plants are difficult to grow or these plants are very expensive. So, the KKN-PPM Team recommends this plant to be preserved and even for sale.

Blaban villagers are rich in these plants, but Blaban villagers sell these purple uwi plants very cheaply, which is around 5,000 rupiah per kilogram, therefore the KKN-PPM team utilizes these purple uwi plants to make purple uwi chips. With innovation into purple uwi chips, purple uwi plant sales increased 60 percent from the beginning. So Blaban village people try to increase these sales by using production equipment so that the sale of purple uwi chips is increasing. Also, other regions rarely process purple uwi into chips, especially purple uwi chips. This could have the opportunity for Blaban Village to become a pioneer for processing purple uwi chips.

Figure 6. Making a purple uwi chips cutting tool

The most preferred product is K3 and K5 because it has the same consumer's rating, which is 89 percent and its characteristics are sweetness, cassava taste, crispness, thickness, and a bit of bitter taste (RiciMainaki, 2016). Therefore, the KKN-PPM Team made a production tool for purple uwi chips. For the processing of purple uwi, several tools are needed, among others, the purple uwi cutting machine, food drying oven, vacuum frying

machine, spinner, sealer. The KKN-PPM team made a cutting machine using wood and stainless steel plates (Figure 6).

Figure 7. Manufacturing of purple uwi chips production machines. (a) vacuum frying machine, (b) spinner.

The KKN-PPM team made a food dryer oven using 2 gas stoves and an iron pipe. The KKN-PPM team used 4 gas stoves, a stainless steel plate, a temperature controller, a galvalume pipe for a vacuum frying machine (Figure 7.a). For the spinner KKN-PPM team uses stainless steel plates, stainless steel nets, turning machines (fan motors), pan size 6 and pan size 4, wood with diameter 7, cable, and electric switch (Figure 7.b). For sealers, the KKN-PPM team uses ready-made tools on the market.

After making all the production equipment, the KKN-PPM team socialized how to use all of the Purple Uwi chips production equipment to the public. This activity was carried out so that the Blaban villagers had provisions to increase the production of purple uwi chips with the equipment made by the KKN-PPM team.

First, to socialize purple uwi chips cutter using tools from the KKN-PPM team, Blaban villagers were very enthusiastic to take part in this activity of purple uwi chips cutter using the cutting tools provided by the KKN-PPM team.

Secondly, to socialize the food drying oven by using tools from the KKN-PPM team, Blaban Village people are very enthusiastic to participate in the training program to dry the food of purple uwi chips (Figure 8). Thirdly socializing the vacuum frying machine by using tools from the KKN-PPM team, Blaban villagers are very enthusiastic in participating in the training activities of cooking purple uwi chips.

Figure 8. Socialization of vacuum frying machines

Fourth, socializing the Spinner machine by using tools from the KKN-PPM team (Figure 9), Blaban villagers were very enthusiastic in following the purple uwi chips drainage training activity using this spinner machine.

Figure 9. Socialization of The Spinner Machine

Fifth, socializing the sealer machine acquired from factories that are already on the market. The KKN-PPM team uses this because the market sealers are already cheap so the KKN-PPM Team does not need to make a sealer tool. Nevertheless, for socialization and training using a sealer tool runs smoothly.

3.4 Offline and online marketing

Before marketing the purple uwi chips product, the KKN-PPM team conducted licensing by using a micro-small business permit (IUMK), the licensing process requires 3 days, namely the coordination meeting of the entire KKN-PPM team to prepare all IUMK requirements. after that, the departure of the IUMK management on the first day.

After licensing is completed, it will be marketed using offline and online marketing. For offline marketing the KKN-PPM team markets purple uwi chips around Blaban Village and in the city center, Arek Lancor Monument, using mass marketing methods. This marketing is divided into 4 times marketing, firstly marketing is done in Blaban village as many as 200 packets of purple uwi chips, secondly, marketing is done smoothly by using 50 packs of Purple Uwi chips

products. Third, marketing is done using 150 packs of chips. Fourth, marketing was carried out with Arek Lancor Monument with 250 packs. The KKN-PPM team focused on selling to Arek Lancor Monument because this place is the center of the city, many people pass through this area, so selling offline is easier.

Online marketing training and management of financial accounting is targeted towards housewives who enter the entrepreneur with the aim of training housewives' skills in working in the business world to develop villagers and housewive as an entrepreneur to processed products. This activity coincided with the closing of a series of KKN-PPM activities.

Based on the activities of the Madura University KKN-PPM (UNIRA) in 2019, from water containment, biopore, uwi planting, organic fertilizer, liquid fertilizer, uwi chips production management, financial management, hopefully, the business will become a provision for the survival of Blaban villager's life both farmers uwi and housewife through KKN-PPM activities.

The results of this study indicate that (1) Strengthening village financial management has a positive effect on the economic independence of Blaban villagers, (2) The role of KKN-PPM Madura University (UNIRA) has a positive effect on the economic independence of Blaban villagers. Based on the results of this study it can be seen that the two independent variables have a significant positive effect on the economic independence of Blaban villagers. Financial management has a positive and significant effect on the quality of financial statements (Luh Risa Astrini, I Gusti Ayu Purnamawati, 2017). Based on the results of the analysis and discussion that has been carried out, a conclusion can be drawn that there is a significant difference between the level of Original Village Income before and after the activities of the KKN-PPM Madura University (UNIRA) in Blaban Village. From the existing research data, the KKN-PPM Team conclude that there was cooperation among Blaban villagers to increase the economic independence of Blaban village residents.

4. CONCLUSIONS

Based on the results of observations, debriefing, training, assistance, knowledge, technology, and innovation in the work program implementation of the KKN-PPM team that has been planned, compiled and implemented, the KKN-PPM team draws several conclusions. Blaban villagers strive for sustainability to make water containment and biopore. This infiltration and biopore are turned into organic fertilizer, so that in Blaban village no longer experiences water dryness and scattered organic waste becomes useful because it has become organic fertilizer. Blaban village people are very enthusiastic to continue making liquid fertilizer. With this liquid fertilizer technology, it can maximize the planting of plants. In addition, this liquid fertilizer side can be traded as well.

Blaban village people are already familiar with the use of technology for the production of purple uwi chips made by the KKN-PPM team so that with this tool the villagers of Blaban can maximize the production of purple uwi chips with better quality and quantity. Blaban Village communities are greatly helped by the existence of offline and online sales, accompanied by the KKN-PPM team, with the existence of offline and online sales training the Blaban village villagers increasingly understands good sales management. Blaban villagers are greatly helped by financial accounting training, so Blaban villagers can calculate the profit from selling these chips. With the Unira KKN PPM-2019 activity, Blaban village people can think rationally and openly to compete in modern life. From the KKN-PPM activities, students not only learn about lecture theory, but practicing in the field and providing guidance, training, and mentoring to Blaban village villagers.

ACKNOWLEDGMENTS

We would like to thank KKN-PPM members, Kemenristek Dikti, LPPM UNIRA, students participating in the KKN-PPM activities series, village heads, village officials, the villagers, and all parties who assist and support the implementation of KKN PPM activities.

REFERENCES

Adnyana, I. G. A. J., Atmadja, A. T., & Herawati, N. T. (2017). Usaha Milik Desa untuk Mewujudkan Green Accounting (Studi pada BUMDes Desa Tajun , Kecamatan Kubutambahan, Kabupaten Buleleng, Provinsi Bali). E-Journal Universitas Pendidikan Ganesha, 1(2), 1–11.

Astrini, L. R., Purnamawati, I. G. A., & Kurniawan, P. S. (2017). Pengaruh Kompetensi Sumber Daya Manusia, Penerapan PSAK 45 tentang Pelaporan Keuangan, Pengelolaan Keuangan dan Pengendalian Internal terhadap Kualitas Laporan Keuangan pada Organisasi Nirlana. E-Journal S1 Ak Universitas Pendidikan Ganesha, 8(2), 1–12.

Leasa, W. B., Amanah, S., & Fatchiya, A. (2018). Kapasitas Pengolah Ubi Kayu “Enbal” dan Pengaruhnya terhadap Keberlanjutan Usaha di Maluku Tenggara. Jurnal Penyuluhan, 14(1), 11–26.

Mainaki, R., Restuhadi, F., dan Rossi, E. (2016). Analisis Pemetaan Kesukaan Konsumen pada Produk Keripik Ubi Kayu Original di Kalangan Mahasiswa Fakultas Pertanian Universitas Riau

Mapping Analysis of Preference Consumer of Cassava Chips Among Students at Faculty of Agriculture in Riau University. JOM Faperta, 3(2), 1–7

Mardhiah, A., & Alfarisyi, M. (2017). Jurnal Agriflora Analisis Kelayakan Usaha Agroindustri Keripik Sambalado Ubi. Agriflora, 1(1), 61–67.

Maria, R., & Lestiana, H. (2014). Pengaruh Penggunaan Lahan Terhadap Fungsi Konservasi Air Tanah di Sub Das Cikapundung. Jurnal RISET Geologi dan Pertambangan, 24(2), 77. https://doi.org/10.14203/risetgeotam2014.v24.85

Masniadi, R., & Sugandi, D. (2017). Analisis Komparatif Tingkat Pendapatan Asli Desa Sebelum dan Sesudah Adanya BUMDes LKM di Desa Sebedo Kecamatan Utan Tahun 2004-2015. Ekonomi dan Bisnis, 14(2), 157–171.

Ni Wayan Sri Pebriyanti, Putu Sukma Kurniawan, E. S. (2017). Analisis Perbandingan Rasio-Rasio Keuangan dan Dampaknya terhadap Kelangsungan Bisnis Badan Usaha Milik Desa (Studi Kasus pada Bumdes di Kabupaten Klungkung). E-Jurnal S1 Ak Universitas Pendidikan Ganesha, 1(1), 1–12.

Puspayanthi, N. L. P. A. D., Prayudi, M. A., & Wahyuni, M. A. (2017). Penguatan pengelolaan keuangan desa dan optimalisasi peran bumdes untuk kemandirian desa pada desa di Kabupaten Jembrana. E-Journal Akuntansi Undiksha, 8(2).

Siswadi, S., Taruna, T., & Purnaweni, H. (2017). KEARIFAN LOKAL DALAM MELESTARIKAN MATA AIR (Studi Kasus di Desa Purwogondo, Kecamatan Boja, Kabupaten Kendal). Jurnal Ilmu Lingkungan, 9(2), 63. https://doi.org/10.14710/jil.9.2.63-68

Thierfelder, C., & Wall, P. C. (2009). Effects of conservation agriculture techniques on infiltration and soil water content in Zambia and Zimbabwe. Soil and Tillage Research, 105(2), 217–227. https://doi.org/10.1016/j.still.2009.07.007

Umar, S. S. A. dan S. (2010). Teknologi Pengolahan Komoditas Unggulan Mendukung Pengembangan Agroindustri di Lahan Lebak. Balai Penelitian Pertanian Lahan Rawa (Balittra)

Victorianto, E., Qomariyah, S., & Sobriyah. (2014). Pengaruh lubang resapan Biopori terhadap limpasan permukaan. E-Jurnal Matriks Teknik Sipil, 3(3 September), 423–430.