

## **Respon Pada “Rektanigama”: Aplikasi Pencatatan Usahatani Berbasis Website**

### ***Response to "Rektanigama": A Website Based Farming Record Application***

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#### **ABSTRAK**

Pencatatan usahatani yang komprehensif, tidak hanya mencatat input-input yang digunakan dalam usahatani, tetapi juga penjadwalan aktivitas yang dilakukan dalam proses budidayanya. Pencatatan usahatani penting untuk dimiliki oleh petani sebagai dasar pengambilan keputusan. Sangat disayangkan bahwa sebagian petani tidak memiliki pencatatan usahatani yang memadai. Dalam pertanian organik, adanya pencatatan usahatani juga menjadi salah satu hal yang dipersyaratkan untuk sertifikasi organik. Penelitian ini bertujuan untuk mengetahui tanggapan pemangku kepentingan dan petani pada Rektanigama, aplikasi pencatatan usahatani berbasis website. Jumlah pemangku kepentingan sebanyak 27 responden dan 21 petani responden. Penelitian dilakukan dengan metode sensus dan focus group discussion. Hasil penelitian menunjukkan bahwa stakeholders dan petani menilai Rektanigama sudah cukup baik dan dapat diaplikasikan sebagai alat pencatatan usahatani. Petani memberikan nilai 7,80 sedangkan pemangku kepentingan memberikan nilai 6,88. Selain itu, petani telah mengetahui pentingnya pencatatan usahatani tetapi belum mengimplementasikannya. Stakeholders dan petani memberikan saran agar Rektanigama disosialisasikan secara massif untuk dapat menunjang kebutuhan pencatatan usahatani terutama bagi petani yang membutuhkan sertifikasi organik.

Kata kunci: pencatatan usahatani, pertanian organic, respon

#### **ABSTRACT**

*. Comprehensive farm recording, not only recording the inputs used in farming, but also scheduling activities carried out in the process of cultivation. Farming records are important to be owned by farmers as a basis for decision making. Unfortunately, some farmers do not have adequate farming records. In organic farming, farm record is also one of the things required for organic certification. This study aims to determine the response of stakeholders and farmers to Rektanigama, a website-based farm recording application. The number of participant in this research are 27 respondents of stakeholders and 21 respondents of farmers. The research was conducted by census method and focus group discussion. The results showed that stakeholders and farmers considered Rektanigama to be sufficiently good and could be applied as a farm recording tool. Total score for Rektanigama according to farmers was 7.80 and 6.88 according to stakeholders, respectively. In addition, farmers already know the importance of recording farming but have not implemented it. Stakeholders and farmers provide advice that the Rektanigama be disseminated massively to be able to support the needs of farming records, especially for farmers who need organic certification.*

Keywords: farm recording, organic farming, response

## Introduction

As many as 12.7% of Indonesia's population work as farmers, and 56% of farmers in Indonesia are farmers with land tenure less than 0.5 hectares (BPS, 2018; Bappenas, 2018). Agricultural development has become an important concept. The concept is carried out through the extensification, intensification, and diversification (Hasanah, J., M. Rondhi, 2018). The existence of a green revolution in 1960 supports this. The impact of green revolution in Indonesia is manifested in the BIMAS (Massal-Guidance), government program embodied in five farms, which among others contains: (1) the use of superior seeds; (2) fertilizing; (3) pest and disease eradication; (4) irrigation; (5) improvements in farming methods. The positive impact of this policy is rice production reaching 126%, and Indonesia has succeeded in achieving self-sufficiency in rice (Nugroho, 2018). Agricultural activities are increasing from time to time in line with the modernization and mechanization of agriculture. Farming requires the recording of these activities to determine the profit and loss of the business. Dudafa (2013) states that in developing countries in general, one of the leading indicators in determining agricultural modernization is the recording of farming. In Nigeria, most farmers do not record farming activities. The conclusion that farming is profitable or not does not come from empirical evidence but is based on intuition. The same pattern is certainly found in farmers in Indonesia (Wulandari *et al*, 2017).

In 2001 the Indonesian government launched the "Go Organic 2010" program and in 2002 the National Standards on organic food were set. In 2010 a survey standard for organic products was adopted (David and Ardiansyah, 2016). The recording of organic farming also becomes one of the evaluation components in organic certification (Subejo, *et al*, 2019). Still, with the organic farming program, which requires the recording of farming, some groups appointed by the government to carry out organic farming cultivation programs are required to have farming records. With the existence of quality assurance under the Indonesian National Standards (SNI), it means that a guarantee that all stages of production, preparation, storage, transportation, and marketing can be inspected and under the standards (SNI, 2013).

Indonesia has organic farming potency due to several advantages. The strength is such there are still a lot of land resources that can be opened to develop organic farming systems, technology to support organic agriculture is sufficiently available such as composting, planting without tillage, biological pesticides, and others (Mayrowani, 2012). To obtain practical

certification, the Directorate General of Food Crops of the Republic of Indonesia requires the existence of documents from the production process to the distribution process (Direktorat Jenderal Pangan, 2016). To facilitate this recording, Rektanigama is presented as a farming recording platform (Radio Republik Indonesia, 2020). Media Indonesia (2020) reports Rektanigama as a farm recording application that is needed in organic farming because it is able to guarantee the traceability of a commodity, thus providing adequate information for consumers. Rektanigama allows farmers to be able to know the activity from the date of planting to the date of harvest. Most of the Indonesian farmers are elderly and have low education, but on the other hand, this recording is based on the latest technology.

This study aims to determine the response of stakeholders and farmers on the Rektanigama website-based recording application. It is important for farmers to use the Rektanigama recording application as a tool in decision making. In addition, for farmers who will carry out organic certification, Rektanigama is a fairly comprehensive farm recording application because it not only records the number of inputs used but also the activities carried out for each activity time. This study reveals new things; introducing and summarizing stakeholder and respondent responses to a new recording technology, and integration of the Industry Revolution 4.0 in farming.

## Material and Methods

This research was conducted in Yogyakarta, Indonesia, in 2019. The method used in this study was through a census. Respondents in this study were extension agents, Sleman Agriculture Department employees, and member of a Tani Makmur farmers group. Tani Makmur is a farmer group in conversion period to legally get organic certification. Extension agent and Agricultural Service employees involved in this study amounted to 27, while the number of farmers involved was 21 respondents. The research began with a demonstration of the use of the Rektanigama farm record website. In addition, respondents were asked to operate the Rektanigama website directly to get a real experience. The research team also presented about how [www.rektanigama.com](http://www.rektanigama.com) works and then gave cases to respondents. The problems are inputted into the system by respondents. Respondents filled out the survey questionnaire provided by the research team, followed by a focus group discussion (FGD). In the census, respondents were asked to provide an assessment. Stakeholder respondents were asked to provide an assessment of the ease of names to remember on a

scale of 1-5, general ease of use on a scale of 1-5, ease of use by extension agents on a scale of 1-5, possible ease of use by farmers on a scale of 1-5, the level of recommendations application to farmers on a scale of 1-5 and the overall Rektanigama value on a scale of 1-10. The range of grades 1-10 was selected in the overall assessment so that respondents could more easily get an overview of the assessment. For farmer respondents, questions regarding the response were arranged to find out how far farmers would like to use the Rektanigama application as a farm recording tool. This is done because farmers are the end users of this application. The basic thing that needs to be asked of farmers is according to the farmer, how important is the recording of farming is needed and whether the recording of farming activities has been carried out. Survey for farmers compiled with *Yes* or *No* question considering to their education level and age. In the final stage of the survey, the *t test* was used to determine the stakeholder and farmer response gaps to Rektanigama. The study ended with a focus group discussion as a qualitative tool to determine farmers' responses. In this FGD, researchers solicited respondents' opinions regarding the ease of use and the application features needed in the Rektanigama.

## Results and Discussion

### What Can Rektanigama Do?

Rektanigama is a website-based farming registration platform, stands for *Rekam Usahatani Gadjah Mada*. Rektanigama can be visited there, [www.rektanigama.com](http://www.rektanigama.com). Through Rektanigama, farmers and agricultural extension workers can input their farming activities, starting from the input of land identity. Rektanigama records the date of planting, events throughout the farm, up to the time of harvest. Both extension workers and farmers can manage Rektanigama. Extension agents can only see farming activities carried out by farmers in their working area, while farmers can see farming activities entered by farmers themselves. Product traceability has been emphasized in a product supply chain from producers to consumers, especially in terms of organic certification, and Rektanigama provides guarantees for this.

Extension agents can monitor what production inputs are used by farmers, including tracking the amount used. Extension workers need to know the dose of use because the instructor can provide an evaluation of the accuracy of the treatment and can use the information on the amount of use of production inputs as an estimate of input requirements in the next harvest season.

For farmers, after the farmer engages in activity input, at the end of the planting period,

the farmer can find out the loss to a business that is undertaken as a basis for managerial decisions. For external parties, Rektanigama provides traceability information on a product so that quality audits can be supported through this application. According to the requirements in the submission of organic certification both in Indonesia and international scope, Rektanigama can be used as a tool to record inputs that are used through the conversion stage. Conversion time is the period from conventional to organic or as long as organic farming is running.

### Stakeholders and Farmers Responses

The respondents in this study consisted of two groups; stakeholder groups and farmer groups. The stakeholder group consists of extension workers and employees of the Sleman Regency Agriculture Office, Yogyakarta, Indonesia. In introducing new technologies, it is important for policymakers to know the needs of farmers (Mwangi and Kariuki, 2015). The role of agricultural extension is vital because small scale farmers need information and training related to innovation, production, and business management (Dirimanova, 2018). These two groups of respondents are relevant because the use of "Rektanigama" website-based farming records will not only be used by farmers as end-users but also by extension agents and agricultural service employees as a database for their scope of work. According to Minae (2001), *cit* Tham-Agyekum and Appiah (2010), one of the obstacles in seeing a business performance is due to the lack of records carried out by extension agents.

Besides, in the initial phase of "Rektanigama" explanation, the instructor acts as an agent who provides training and assistance to the farmer groups that are his responsibility. The instructor can assist the farmer for at least one planting period. The opinion of stakeholders and extension workers is critical to know because farmers and extension workers are the field workers who have the most control over every detail of the activities and phases of farming that are being managed. The important thing from the characteristics of respondents, overall the majority of respondents aged over 40 years, means that respondents are of productive age and are allegedly able to get technological innovation and are willing to adopt the technology. Respondent characteristics are shown in Table 1.

Stakeholders consisting of extension workers and employees of the majority of agriculture services have a university degree. In Indonesia, the requirement for minimum educational qualification to become an agricultural instructor is the Senior High School.

In carrying out their work, extension workers are an extension of the agricultural service employees. Policies planned by the agriculture service are socialized and implemented by farmers through extension agents. Thus, extension

agents play an important role in the dissemination of systems and technology so that the ability of extension workers in communicating with farmers becomes crucial.

Table 1. Characteristics of Respondents

| Characteristics                          | Stakeholders (%)          | Farmers (%) |
|--|---------------------------|-------------|
| Age                                      |                           |             |
| 21-40 years old                          | 22.2                      | 23.81       |
| 41-60 years old                          | 77.7                      | 42.86       |
| more than 60 years old                   | (retired in 60 years old) | 33.33       |
| Education                                |                           |             |
| Without formal education                 | (minimum education for    | 28.57       |
| Elementary school                        | stakeholders is senior    | 28.57       |
| Junior High School                       | high school)              | 23.81       |
| Senior High School                       | 33.33                     | 14.29       |
| Diploma                                  | 23.81                     |             |
| Undergraduate                            | 42.86                     |             |
| Farming experience                       |                           |             |
| to 10 years                              |                           | 71.43       |
| 10-20 years                              |                           | 9.52        |
| more than 20 years                       |                           | 19.05       |
| Experience in practicing organic farming |                           |             |
| to 3 years                               |                           | 9.52        |
| more than three years                    |                           | 90.48       |

Source: Primary Data Analysis, 2019

The education gap is often one of the things that make communication between stakeholders and farmers difficult. From Table 1 it is known that the majority are only educated at the Junior High School level. In this study, there were no bachelor educated farmers. Nevertheless, the ease of use of the Rektanigama application is expected to be able to provide solutions to the problem of technology adoption. Rektanigama has been designed in such a way that it is quite easy to use by users of various levels of education. Research by Fatmawati et al. (2018) shows that farmers with Junior High School level education provide a positive attitude towards innovation, such as eco-friendly agriculture. According to Burhansyah (2014), formal education is not significant to determine the adoption of agricultural innovations. Therefore, in utilizing this Rektanigama application, a counsellor is needed as a counsellor because farmers' education level tends to be low.

Young farmers in the study also tended to have the smallest percentage among other age ranges. According to the agricultural situation, Indonesia needs more young farmers. According to Awaludin et al. (2018), the number of young farmers in Indonesia is far less when compared to old farmers. The condition is quite worrying because farmers' regeneration will be disrupted.

The younger generation needs the motive to keep farming, for example, the successful experiences of other young farmers. The Indonesian Ministry of Agriculture has several funding programs specifically for young agriculture-based aspiring entrepreneurs. Furthermore, the introduction of technology in the agricultural sector is also expected to be one of the attractions for young farmers.

Concerning to farm experience, the majority of respondents became farmers with less than ten years experienced. Respondents under the age of 60 tend to have less experience being farmers than respondents over the age of 60. Respondents with less farming experience usually have businesses outside of agriculture in the previous time. Farmers, with its characteristic, only really focus on doing business when the off-farm business is abandoned (retired) due to various things such as retiring or deciding to quit their previous job.

Respondents in this study are also farmer groups in the preparation stage towards organic rice farming and certification efforts. At present most of the farmers have reduced the use of chemical inputs for the type of farming being carried out. 90.48% stated that farmers had managed their farms organically even though they have not received organic certificates. To be able

to claim that the farming is legally organic, a license from the National Certification Agency (BSN) through the Organic Certification Institute (LSO) is appointed and selected by farmers. Entering the socialization stage, the research team collected aspirations from stakeholders. The

opinions of stakeholders regarding this application are summarized before the application is disseminated to farmers. The results of opinion polls and assessments with stakeholders are shown in Table 2.

Table 2. Stakeholder Opinions Regarding Rektanigama

| Number | Item of Questions                      | Maximum | Respondents Rating |
|--------|--|---------|--------------------|
| 1      | Application's name is easy to remember | 5       | 3.18               |
| 2      | Rektanigama is easy to be used         | 5       | 3.29               |
| 3      | The use for extension agents           | 5       | 3.67               |
| 4      | The use of farmers                     | 5       | 3.67               |
| 5      | Level of recommendation for farmers    | 5       | 3.29               |
| 6      | The overall rate of Rektanigama        | 10      | 6.88               |

Source: Primary Data Analysis, 2019

Regarding the name, before this application was changed to Rektanigama (Gadjah Mada Farming Record), this application was named Pokniluh (Farmer Group and Extension). Rektanigama was chosen as the official name of this application because Rektanigama reflects Gadjah Mada University as the team that holds Intellectual Property Rights (IPR) for the recording of this farm. Respondents were also asked to provide an assessment of the ease, usefulness of extension workers and farmers, and the level of recommendations for farmers. Overall, respondents gave an average rating of 3.42 with a reasonably good assessment category. The evaluation shows that the stakeholders gave a positive response to the Rektanigama. Also, stakeholder respondents assigned a score of 6.88 for the overall performance of this application.

According to agricultural extension workers and officials, the Rektanigama application will assist farmers in recording activities carried out during farming activities. These activities will be an evaluation material for farmers in conducting further farming activities. Besides, for extension

workers, Rektanigama can be a digital data storage facility that can be monitored remotely. Even so, the age constraints of extension workers and farmers will become obstacles in their use. Stakeholders suggest that this application is more often disseminated to farmers.

In the next stage, this application is demonstrated to farmer groups to organic. The results of the demonstration are shown in Table 3. Measurement of responses for stakeholders and farmers is not the same for several aspects because farmers are the end users of this application. Therefore, the response of farmers to Rektanigama begins with the measurement of farmers' awareness of the recording of farming and recording activities have been done or not. Awareness of a matter is one of the factors that influence the adoption process (Acheampong, et al, 2018). The relatively low educational background of farmers and old age of farmers cause the questionnaire to be arranged in such a way that it is easy for farmers to understand so *Yes* and *No* measurement is chosen in this research.

Table 3. Opinions of Farmers Regarding Rektanigama

| Number | Questions                                     | Yes (%) | No (%) |
|--------|---|---------|--------|
| 1      | Farming record is important                   | 100     | 0      |
| 2      | Recorded farming activities                   | 23.81   | 76.19  |
| 3      | Rektanigama is useful for farmers             | 100     | 0      |
| 4      | Willing to use Rektanigama for farming record | 90.48   | 9.52   |
| 5      | The overall rate of Rektanigama (maximum: 10) | 7.80    |        |

Source: Primary Data Analysis, 2019

Table 4. T-test of overall rate of Rektanigama

| The overall rate of Rektanigama | Rate | Sig.    |
|---------------------------------|------|---------|
| Farmers                         | 7.80 | 0.029** |
| Stakeholders                    | 6.88 |         |

Source: Primary Data Analysis, 2019

(\*\*Significant in 95%)

The results of the Tham-Agyekum and Appiah (2010) study in Ghana stated that farmers did not record farms because farmers did not benefit from recording the opposite. The results of this study noted that all farmer respondents considered that farming enumeration was important to do. Research in Ghana conducted in 2013 showed the same thing; farmers knew the importance of recording, so it was hoped that the farming recording program would be successful (Dudafa, 2013). The fact is in contradiction with farming recording activities, which are only done by a few farmers. According to respondents, stakeholders have provided a form of recording farming, but farmers do not know the procedures for recording farm activities carried out. Besides, the absence of assistance regarding the continued function of a record is a further problem. Farmers also stated that the registration form provided by the government was not practical. For this reason, Rektanigama is expected to be the solution. All farmers stated that Rektanigama was very useful especially to provide internal control documents for organic certification. The majority of farmers are willing to use Rektanigama as a means of recording farming under the guidance of extension workers.

In line with the results that the farmers knew the importance of recording farming, the farmers stated that Rektanigama is beneficial for farmers. The majority of farmers are willing to use Rektanigama as a means of the recording business. Nevertheless, farmers ask to be accompanied by extension agents or related offices. Rektanigama assessment results, according to farmers, are higher when compared to the assessment results by extension agents. The results of this assessment differed significantly between the two sample groups. The result can be a good indication of the use of the Rektanigama application.

### Conclusions

Stakeholders and extension workers are known to have an understanding that farm recording is an important thing to do, especially for organic farming certification needs. Through the record of farming, farmers can find out the financial condition of their farming so that farmers can make managerial decisions. Farmer's

appraisal of the Rektanigama farming application is higher when compared to extension appraisal. Farmers and stakeholders expect that Rektanigama is more often socialized with farmers and extension workers and can accommodate records for all commodities.

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### References

- Acheampong, P., N.E. Amengor, A.Nimo-Wiredu, D.Adogoba, B. Nsiah-Frimpon, J. Haleegoah, and A. Adu-Appiah. (2018). Ghana Association Of Agricultural Economists (Gaae) 2nd GAAE Conference .
- Awaludin, O., Sumardjo, A.Satria, A.Fatchiya. (2018). A Review on Farmer Regeneration and Its Determining Factors in Indonesia. *International Journal of Progressive Sciences and Technologies (IJPSAT)* 10(2): 218-230
- Burhansyah, R.. (2014). Factors Affecting the Adoption of Agricultural Innovation among Farmers Group in West Kalimantan (Case Studies: Pontianak and Landak Districts). *Informatika Pertanian*, 23 (1): 65 – 74.
- David, W. and Ardiansyah. (2016). Organic agriculture in Indonesia: opportunities and challenges. *Organic Agriculture*.
- Direktorat Jenderal Pangan Kementerian Pertanian Republik Indonesia. (2016). Petunjuk Teknis Fasilitasi Pertanian Organik.
- Dirimanova, V. (2018). The Role Of The Extension Services For The Development Of The Small-Scale Farms In Bulgaria. *Bulgarian Journal of Agricultural Science*, 24 (1): 35–39.
- Dudafa, U.J. (2013). Record-Keeping Among Small Farmers in Nigeria: Problems

- and Prospects. *International Journal of Scientific Research* 6(2): 214-220.
- Fatmawati, Lahming, A.R.Asrib, N.Pertiwi, G.D. Dirawan. (2018). The Effect of Education Level on Farmer's Behavior Eco-Friendly to Application in Gowa, Indonesia. *Journal of Physics: Conference Series*
- Hasanah, J., M. Rondhi, dan T. D. Hapsari. (2018). Analisis Risiko Produksi Usahatani Padi Organik Di Desa Rowosari Kecamatan Sumberjambe Kabupaten Jember. *Jurnal Agribisnis Indonesia* 6(1): 23-34.
- Mayrowani, H. (2012). Pengembangan Pertanian Organik Di Indonesia. *Forum Penelitian Agro Ekonomi*, 30 (2): 91 – 108.
- Media Indonesia. (2020). Rektanigama Aplikasi Pertanian ala UGM. <https://mediaindonesia.com/read/detail/289297-rektanigama-aplikasi-pertanian-ala-ugm>
- Mubyarto. (1994). Pengantar Ekonomi Pertanian, Jakarta: LP3ES.
- Minae, S., Baker, D., Dixon, J. (2003). Status of Farm Data Systems and Farmer Decision Support in Sub-Saharan Africa, FAO Rome.
- Mwangi, M., and S. Kariuki. (2015). Factor of New Agricultural Technology by Smallholders in Developing Country. *Journal of Economics and Sustainable Development* 6 (5).
- Nugroho, W. (2018). Konstruksi sosial revolusi hijau di era orde baru. *Jurnal Sosial-Ekonomi Dan Agribisnis*, 12(1), 54–62. Retrieved from <https://doi.org/10.24843/SOCA.2018.v12.i01.p04%0Ahttps://ojs.unud.ac.id/index.php/soca>
- Radio Republik Indonesia. (2010). Rektanigama, Platform Digital Berbasis Website untuk Catat Kegiatan Petani [http://rri.co.id/yogyakarta/post/berita/785304/ekonomi/rektanigama\\_platform\\_digital\\_berbasis\\_website\\_untuk\\_catat\\_kegiatan\\_petani.html](http://rri.co.id/yogyakarta/post/berita/785304/ekonomi/rektanigama_platform_digital_berbasis_website_untuk_catat_kegiatan_petani.html)
- Subejo, Irham, P.N. Sari, A.W.Widada, dan A. Nurhayati. (2019). Problematika Pengembangan Padi Organik di Sawangan Magelang serta Peluang Sertifikasi Internasional. *Jurnal Teknosains*, 1 (9): 29-43.
- Tham-Agyekum, E.K. (2010). Assessing Farm Record Keeping Behaviour among Small-Scale Poultry Farmers in the Ga East Municipality. *Journal of Agricultural Science*. 2 (4).
- Wulandari, E. Ernah dan D. Supyandi. (2017). Penguatan Kemampuan Manajerial Petani Melalui Pelatihan Dan Pendampingan Pencatatan Finansial Usaha Tani Di Kabupaten Cianjur. Dharmakarya. *Jurnal Aplikasi Ipteks untuk Masyarakat* 6(3): 189-192.