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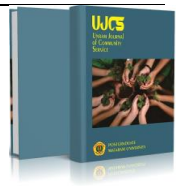

Agricultural Digitalization and Strengthening Farmer Capacity through an Agricultural Website and AgriTech Workshop in Gumeng Village, Jenawi District, Karanganyar Regency

Desna Ayu Wijayanti[1], Terrensia Sekar Pamastutiningtyas[2], Ajietama Imam Wiyoga[2], Anggita Ghina Safitri[3], Nasrin Aksani[1], Pitri Wulandari[2], Annisa Alfi Febriana[2], Erwin Irawan[1], Jumiati Sulaika Boi[2]

[1] Faculty of Science and Technology, Universitas Muhammadiyah Karanganyar, Karanganyar, Indonesia.
[2] Faculty of Communication and Business, Universitas Muhammadiyah Karanganyar, Karanganyar, Indonesia.
[3] Faculty of Health and Education, Universitas Muhammadiyah Karanganyar, Karanganyar, Indonesia.

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Corresponding Author:
Terrensia Sekar Pamastutiningtyas
tyasterrensia@umuka.ac.id

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Abstract: This community service activity was conducted in collaboration with the Muhammadiyah University of Karanganyar's Real Work Lecture (KKN) activities and KKN Group 13 in Gumeng Village, Jenawi District, Karanganyar Regency. The purpose of the activity is to support the development of local potential through agricultural digitalization and capacity building for farmers. The main program includes the launch of the Desa Gumeng agricultural website as a promotional and educational medium, as well as the organization of the "Agritech Evolution" workshop, which discusses balanced fertilization and environmentally friendly pest control. The implementation methods consist of website design, socialization, technical training, interactive lectures, and participatory discussions. The results of the activity show enthusiasm from approximately 30 participants, increased knowledge among farmers regarding fertilization and pest control, and the availability of a website that can be used as a marketing medium. The conclusion indicates that the synergy of digitalization and human resource capacity building is key to the success of rural agricultural development.

Keywords: Agriculture, Agritech Workshop, Digitalization, Fertilization, Pest Control.

Introduction

Agriculture remains the main backbone of the rural economy in Indonesia (Noviar et al., 2023; Yuniasih et al., 2023; Zulhafadi & Mubarak, 2021). Gumeng Village, located in Jenawi District, Karanganyar Regency, is known as one of the horticultural production centers with leading commodities such as scallions, potatoes, carrots, mustard greens, celery, and lettuce (Diarto et al., 2021; Setyorini & Yani, 2020). The geographical conditions of the area, which is located in the highlands with a cool climate, support the growth of these vegetable commodities. Most of the population relies on the agricultural sector for their livelihood, either as landowners or as farm laborers.

However, this great potential has not been accompanied by an effective marketing system. The agricultural products of Gumeng Village have been distributed conventionally so far, relying on local collectors or traditional markets. This often leads to unstable prices and less-than-optimal profits for farmers. Additionally, limited access to market information leaves farmers with little bargaining power over their products (Pamungkas et al., 2023; Suryanti et al., 2021).

Rasyid & Ningsih (2024) explain that in the current era of digital transformation, information technology is actually capable of addressing some of these issues. Utilizing digital platforms, such as village agricultural websites, can serve as a means to expand market reach, introduce the village's flagship products, and open up

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opportunities for collaboration with external parties (Halawa, 2024; Septi et al., 2025; Soedarto & Ainiyah, 2022).

The service activity integrated with the UMUKA 13 KKN program in Gumeng Village is present as an answer to this challenge. The main program, the launch of the Desa Gumeng Agricultural Website, is intended to serve as a digital-based platform for promotion and education. At the same time, the Agritech Evolution Workshop aims to enhance farmers' technical capacity in modern agricultural cultivation. The synergy of these two programs is expected to have a tangible impact on improving the welfare of rural communities. Arifin et al. (2024) explain that, in practice, incorporating digital touches is indeed necessary to enhance and develop the potential of horticulture.

Additionally, this activity aligns with the university's vision of providing science-based solutions that are practical and meet the needs of society. By involving students, this program also serves as a fundamental learning tool for young people to apply the knowledge they gain on campus (Asyfiradayati et al., 2024; Ramadhan & Sutrisno, 2021).

The purpose of this activity is to support sustainable agricultural development in Gumeng Village through the utilization of digital technology and strengthening farmer capacity. Specifically, the objectives of this service activity are to develop website-based promotion tools for village agricultural products, provide farmers with an understanding of balanced fertilization techniques and environmentally friendly pest control, raise community awareness about the importance of digitalization in the agricultural sector, and build sustainable collaboration between universities, village governments, and the community in developing local potential.

Method

The location and time of the activity will be held in Gumeng Village, Jenawi District, Karanganyar Regency in August 2025. With participants: approximately 30 people, consisting of vegetable farmers represented by the Dusun Heads in Gumeng Village, local farmers from Gumeng Village, agricultural MSME actors, students, and the general public.

The stages of activities in implementing this service activity are as follows:

a. Analysis of community needs through observation and discussion with active farmer groups in Gumeng Village and the Village Head,
b. Website development: design, product content, cultivation information, and marketing contacts,
c. Website socialization and launch, and
d. Agritech Evolution Workshop with resource person Burhan Efendi, S.P., M.P., covering balanced fertilization and environmentally friendly pest control. Workshop methods include interactive lectures, discussions, Q&A, and case studies.

Result and Discussion

Implementation of Activities

The initial step taken by the Service Team, along with the UMUKA 13 Gumeng KKN Team, was to conduct a problem analysis to identify the potential and challenges faced by the Gumeng community. After that, a socialization of the work program titled "*agritech workshop*" was conducted for the local Village Head, who then socialized it to partners, namely local farmers, members/farmer groups, MSME actors, and the general public. In this digitalization program, the UMUKA 13 KKN Team from Gumeng Village collaborated with Karang Taruna, which will serve as the platform or location for the website's digitalization. Satria et al. (2025) explain that digital inequality in villages requires actors to operate the technology so that the proposed digitalization design can function as expected.

As for the series of service activities that have been carried out, they consist of:

1. Design of the Gumeng Village Agricultural Website. The website, launched on August 26, 2025, is the first digital innovation in Gumeng Village in the field of agriculture. The main features of the website include:
   a) Village Profile & Featured Commodities: information about local vegetables (onions, potatoes, carrots, mustard greens, celery, lettuce),
   b) Product & Harvest Gallery: uploads photos of community agricultural products,
   c) Contact & Marketing: direct access for consumers and businesses who want to purchase village products, and
   d) Agricultural Education Articles: short content about cultivation practices, fertilization, and pest control.

   The website launch was done symbolically by handing over access to the village devices. This handover is not merely a formality for the team, but also a contribution from the students who played a role in designing and building the website to advance digital literacy for the Gumeng Village community. Therefore, a website demonstration was held by representatives of the youth from the local Karang Taruna village. Positive responses came from the village government, which considered this platform a "new venue for introducing the village's potential to the outside world."

Figure 1. Demonstration and Launch of the Gumeng Village Agricultural Website by Informatics Students and the UMUKA KKN Team 13 of Gumeng Village

Figure 2. Group Photo

This website serves as a concrete example of the application of the digital agriculture concept. Some previous studies have also emphasized that the digitalization of villages can accelerate the marketing of agricultural products and strengthen the competitiveness of local products ((Rasyid & Ningsih, 2024; Ulma et al., 2024). The challenge ahead is the still-limited digital literacy of farmers, so further training is needed to ensure the website does not just remain a project, but is truly actively managed by the community.

2. Agritech Evolution Workshop

The Agritech Evolution-themed workshop featured speakers Burhan Efendi, S.P., M.P., and Mr. Mardiono, a practitioner in the field of horticultural pest control, who presented materials on:

a) Basic concepts of plant fertilization,
b) Techniques for determining the type, dosage, and timing of fertilization,
c) Identification of plant pests that frequently appear in Gumeng,
d) Environmentally friendly pest control strategies, and
e) Application of smart farming to improve production efficiency.

The number of participants is approximately 30 people, consisting of vegetable farmers, MSME entrepreneurs, students, and the general public. The delivery methods used in this socialization and training, which are presented as a "workshop," include interactive lectures, participatory discussions, question-and-answer sessions, and case studies.

Figure 3. Fertilizer and Pesticide Production Practices

Figure 4. Fertilizer and pesticide production practices

The workshop results showed a 67% increase in farmers' understanding of balanced fertilization and environmentally friendly pest control. This is

important because many farmers previously still used excessive chemical fertilizers, which could potentially reduce soil fertility. With the new knowledge, it is hoped that cultivation practices will be more environmentally friendly and sustainable (Mayang et al., 2024; Sulistijanti et al., 2025).

Student involvement in facilitating discussions also demonstrates the transfer of knowledge between universities and rural communities. This aligns with Fauzi (2025), who stated that this activity supports the concept of community empowerment, where the community is not only a recipient of the program but also actively involved.

Impact and Achievements

Table 1. Result of Service Activities

Activities	Output	Achievement Indicators	Impact on the Community
Launch of Agricultural Website	The website is an active website with product features, a gallery, and contact information	Website accessible, village has an admin account	Facilitates the promotion of harvest and expands market access
Agritech Evolution Workshop	Fertilization & pest control materials	60 participants attended, actively asked questions, and discussed	Increased farmers' knowledge of sustainable cultivation
KKN Mentoring	Digital & agritech skill transfer	The community learned how to upload products to the website	Encouraged active community participation in digitalization

The results of the community service implementation activities can be described by the community response and the impact of these activities, which are detailed in this discussion.

1. Community Response to the Agricultural Website

   The launch of the Gumeng Village Agricultural Website received a positive response from the community and village officials. The village government stated that the presence of this website could be a "digital window" for Gumeng's agricultural products. The farmers present were enthusiastic because they saw new opportunities to expand the marketing of their harvests.

   Some farmers stated that the marketing of their products has so far been heavily reliant on local collectors with fluctuating prices. With the website, they hope to connect directly with consumers, restaurants, and modern markets. Community response was also evident during the trial sessions: farmers were interested in learning how to upload product photos to the website and add brief descriptions. Nevertheless, some participants admitted they were not yet accustomed to using digital technology. This indicates that website sustainability requires further guidance in terms of digital literacy.

2. Community Response to the Agritech Workshop

   The Agritech Evolution Workshop, featuring speaker Burhan Efendi, S.P., M.P., was attended by approximately 30 participants from farmers, MSME actors, students, and the general public. The enthusiasm of the participants was evident in the full attendance until the end of the event and the large number of questions asked during the discussion session.

   Participants were very interested in the balanced fertilization material because most farmers are still accustomed to using high doses of chemical fertilizers. Material on environmentally friendly pest control is also considered important, given that pest attacks are often a significant constraint in horticultural production in Gumeng (Fakhrudin et al., 2023; Susanti et al., 2023).

   Some participants even requested examples of practical application in the field as a follow-up to the workshop, indicating that the material presented is relevant to their needs. KKN students are also involved in helping to explain simple case examples, making the activity atmosphere more interactive.

3. Impact of Activities on the Community

   The tangible results of this activity can be seen in the following aspects:

   a) Increased knowledge: participants understand the importance of fertilizing according to dosage and timing, as well as environmentally friendly pest control strategies.
   b) Digital literacy: Although still new, the community is beginning to recognize the importance of digital media for promoting agricultural products.
   c) Rural youth involvement: Some young people have expressed interest in becoming village website administrators, raising hopes for the sustainability of managing this platform.
   d) Connectivity with universities: The presence of UMUKA students is felt to bring new energy to the village community, as they can discuss

directly with young people who bring a perspective of digitalization.

Conclusion

Integrated community service through UMUKA KKN 13 successfully introduced digital innovations, including a village agricultural website, and increased farmer capacity through 67% of agritech workshops. The synergy between digital technology and technical cultivation skills proved to have a positive impact on Gumeng Village.

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