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Implementation of Integrated Farming with the Nuance of Good Agriculture Practice Based on the AgroMap Info Web Towards Achieving SDGs 2030 in Balesari Village

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Abstract

Purpose: The aim of community service is to empower the community and educate the community regarding organic farming through making liquid organic fertilizer, integrated farming through an aquaponic system, and applying the AgroMap Info website for agricultural sustainability.

Method: The program was conducted offline using the Participatory Rural Appraisal (PRA) method, involving the community as active participants. Activities were held in various hamlets to ensure full engagement and practical learning.

Practical Applications: The program provided practical knowledge on organic farming and aquaponics, promoting better agricultural practices. The AgroMap Info website helped farmers access critical agricultural data, enhancing sustainability.

Conclusion: Provide a concise summary of the primary findings derived from the study. Emphasize the importance of the results and their contribution to a broader comprehension of the topic or resolution of the research issue outlined in the introductory section.

Introduction

Balesari Village is one of the villages located in Windusari District, Magelang

Regency, Central Java with an area of 355.17 Ha with a population of almost 3000 people (Faradisa et al., 2018).The problems in Balesari Village are mainly in the fields of agriculture and animal husbandry. Farmers lack knowledge of agricultural cultivation techniques and are still dependent on the use of chemical fertilizers. There is still a high level of household waste, both organic and inorganic waste, which has not been utilized by the community. Balesari Village has the potential for fish cultivation and bamboo production centers as well as settlements with large yards in each resident's house sufficient to realize integrated agriculture and improve the quality of the natural resource environment. The preservation of agricultural land resources and environmental quality as well as the sustainability of production systems are critical for agricultural businesses in tropical countries, including Indonesia (Sugiharto et al., 2023; Wilis, 2022).

One concept that has now been widely realized but is difficult to develop is the concept of sustainable agriculture (Hamzah et al., 2023). The implementation of environmentally friendly integrated farming is an effort to preserve the environment that can be achieved through reducing industrial waste and exploiting natural resources. This also encourages improvement in community welfare both from an economic and socio-cultural perspective by creating awareness about a better quality of life (Marini et al., 2024; Michelle et al., 2023).

The implementation of the Integrated Farming System in residents' yards aims to ensure that community partners are skilled at creating agricultural products with the applied concept of F4 (Food, Feed, Fuel, and Fertilizer) which are environmentally friendly, thereby encouraging increased community welfare both from an economic and socio-cultural perspective by creating awareness about a better quality of life (Mujiburrahman et al., 2024; Pratiwi et al., 2021).Integrated Farming System innovation helps agricultural actors in implementing sustainable development, namely the formation of organic villages that have a better level of productivity in home gardens and environmental conservation. This is in line with several points in the SDGs regarding decent work and economic growth that can be carried out sustainably and independently by every resident in each hamlet of Balesari Village as well as the adoption of an integrated agricultural sustainable development model by other villages (Junaidi et al., 2024; Nurfatiyah & Jamaluddin, 2018; Sihombing, 2022). The aim of community service is to empower the community and educate the community regarding organic farming through making liquid organic fertilizer, integrated farming through an aquaponic system, and applying the AgroMap Info website for agricultural sustainability.

Implementation of this program can increase the productivity of agricultural, livestock, and fisheries products in residents' yards which have not been utilized optimally. The Integrated Farming System innovation which is integrated with the website can empower PKK mothers and form organic villages. The benefits and positive impacts of realizing this service program can increase knowledge about the Integrated Farming System, partner communities can utilize organic waste (livestock waste and household waste) and inorganic waste (oil bottles), partner communities are skilled in utilizing yard land so that it is more productive, and skilled in managing agricultural ecosystems and using the AgroMap Info Website for agricultural sustainability.

Method

Implementation of service programs public in a way whole held offline in the field with method Participatory Rural Appraisal (PRA) as method empowerment society. This method emphasizes community involvement in all over activities and team’s executor as facilitator and resource person. Society is placed as researchers, planners and program implementers development, no just object development. Implementation of programs for every activity implemented in each hamlet to maximize absorption training and practice activities. As for the stages implementation of service programs public as following.

a. Activity Preparation

The preparatory stage for activities includes surveying and licensing the ecosystem

development location in Balesari Village by visiting all hamlets in the partner villages, namely Kembangsari Hamlet, Malanggaten Hamlet, Jambean Hamlet, Mojo Hamlet and Salaan Hamlet. The team visited each hamlet head and head of the PKK in each hamlet as community representatives for the initial step of coordinating activity planning and notification of programs to be implemented.

b. Socialization
   The activity was attended by the PKK leader, PKK women, and hamlet heads as well as teams carried out in each hamlet. In this activity, the team provides information and explains the activity timeline and details of the implementation of each activity. The team also provided discussion space for socialization participants to provide responses in the form of suggestions and criticism regarding the timeline and implementation methods before implementation in the field was carried out.
c. Training and practice in creating an integrated agricultural ecosystem
   The activity focuses on providing training on creating aquaponic ecosystems and organic fertilizer to women in each hamlet according to the location for creating the ecosystem that was agreed upon during the preparation of the activity. Apart from the PKK women, the team was also assisted by residents such as Karang Taruna youth and fathers in the practice of creating an aquaponic ecosystem.
d. Integrated agricultural management training and practices integrated with the Agro Map Info website
   The activity contains socialization on how to use the Agro Map Info web platform which aims to facilitate partner community access to information about integrated agriculture that is connected to data in the field during the program. With information available online, it can support the sustainable and efficient development of agriculture, animal husbandry and fisheries in Balesari Village. Activities were carried out and participated in by PKK women in each hamlet. It is hoped that PKK mothers can become educators for other family members so that information can be accessed by all residents of Balesari Village.
e. Training and practice in the use and management of integrated agricultural ecosystems both before harvest, during harvest and after harvest
   Activities are carried out flexibly during the program, socialization of management and general use is carried out when creating the ecosystem. Apart from that, in the monitoring process carried out the team will provide direction for the development of each ecosystem in each hamlet, both for treatment before harvest, during harvest and after harvest.
f. Making partner guidebooks and activity publications
   For each activity, the team always prepares flyers and presentations as reference material for the activity which will then be compiled and printed into a partner guidebook. The team also publishes each activity via social media in the form of TikTok and Instagram as educational content.
g. Monitoring and evaluation
   Monitoring is carried out every week by the team to find out developments and obstacles that occur in each ecosystem. Apart from that, the team together with residents and supervisors will carry out evaluations regarding monitoring results and obstacles in each activity to provide material for improvements in the next activities in the program series. Evaluations are carried out routinely using cross-methods, namely internal teams, teams with supervisors, and teams with residents and supervisors to obtain optimal solutions.
h. Report generation
   Progress reports and final reports are prepared in stages from the results of implementing activities as well as monitoring and evaluating activities during the 5 months of implementation in the partner village, namely Balesari Village. Reports are made to determine the achievement of success indicators of the program that has

been implemented.

Result

The implementation of community service activities began with a team visit to the location for preparation (Figure 1). This included organizing tools, materials, and coordinating with local leaders such as the village head and PKK representatives. Coordination began on June 16, with ongoing communication over five months, leading to a socialization event on July 7 to align with the local community and minimize errors in execution.

The team prepared for activities in five hamlets of Balesari Village, ensuring proper tools, materials, and training content. Socialization took place on July 3 and 12, 2023, involving 106 participants, mainly PKK members. The program introduced aquaponics technology, POC (liquid organic fertilizer), and the AgroMap Info website, which was designed to assist with integrated farming practices.

Training sessions for aquaponics setup and organic fertilizer production were held on July 23-25, with 96 participants. Many participants, who initially lacked familiarity with the technology, were enthusiastic and developed innovative ideas based on the training. The program also led to discussions on scaling aquaponics from household to industrial levels (Figure 5).

Figure 1. Visit team implementing PPM to location partner for do it preparation activity

Figure 2. Socialization PPM team schedules plan training integrated fish-vegetable farming technology, making POC, and using the agromap info website

The agreed timeline for carrying out the community service program, focused on integrated farming practices using the AgroMap Info website, ran from July to September 2023. The activities took place at the homes of PKK members in each hamlet of Balesari Village, which were spacious and easily accessible. Based on the agreed schedule between the team and partners, preparations were made, including gathering materials, equipment, and supplies for aquaponics, liquid organic fertilizer production, and training on using the AgroMap Info website. The aquaponics setup involved assembling installations made of bamboo and recycled plastic bottles, and planting media filled with lettuce and bok choy (Figure 4).

Figure 3. Assembly installation aquaponics with utilization bamboo

Figure 4. placing hydroponic pots

Simultaneously, participants produced liquid organic fertilizer from household waste and animal manure. These activities, held on July 23, 24, and 25, involved 96 community members, who showed great enthusiasm during the training and practice (Figure 5). Many participants began developing ideas for improving the technology, which they had not previously considered. Following the training, they expressed a desire to expand and adapt these techniques according to available resources. The community is now ready to scale the aquaponics system from a household to an industrial level.

Figure 5. Enthusiastic public partner follows training and practice

Through the Student Creativity Program in community service, strong collaboration was built between the PKK members and the PKM team as facilitators. The main goal of the project to implement web-based integrated farming technology using the AgroMap Info platform was successfully achieved and is sustainable. Additionally, this initiative addressed key issues in the region, such as low agricultural and livestock productivity, inadequate waste management, and a lack of farming knowledge. Aquaponics technology offers an opportunity for participants to increase their income through integrated fish and vegetable farming, providing a solution to food security challenges (Nawawi et al., 2018). This technology is well-suited for development in Kembang Sari, Mojo, Salaan, Malanggaten, and Jambean hamlets in Balesari Village, with organic, pesticide-free vegetables contributing to

improved family nutrition.

After completing the training on aquaponics and liquid organic fertilizer production, the program continued with socialization and practice using the AgroMap Info website on September 2, 3, and 9, 2023. These sessions introduced the platform, making it easier for participants to access information about integrated farming, aligned with real-time data collected during the program (Figure 6). This online tool supports sustainable and efficient agriculture, livestock, and fisheries development in Balesari Village. The PKK mothers who participated are expected to educate other family members, ensuring that information reaches the entire community (Figure 6). The website, agromapbalesari.id, serves as a resource for ongoing education and updates on agricultural activities in the village. The team also coordinated with local youth groups to manage the AgroMap Info website post-program, ensuring its continued use and impact (Figure 7).

Figure 6. Socialization method use of the Agro Map Info web platform

Figure 7. Coordination with coral cadet as partner continuity

Table 1. Increased knowledge and skills of Sekintang Daya Farmer Group members in implementing appropriate biofloc-aquaponic technology

Aspect Evaluation	Amount farmers who understand integrated farming technology (aquaponics and POC) web- based agromap info (%)	
	Beginning of activity (pretest)	End of activity (posttest)
Knowledge about agricultural systems integrated	40.00	100.00
Utilization waste agriculture, waste livestock, and waste House ladder optimally	30.00	100.00
Skills utilization land yard and waste	35.00	100.00

Skills use and manage ecosystem aquaponics as well as make liquid organic fertilizer	25.00	95.00
Skills manage ecosystem agriculture integrated (aquaponics and fertilizer organic liquid) when harvest and after harvest	30.00	90.00
Skills using the Agro Map Info website	20.00	90.00
Average percentage of results evaluation	30	95.83

Based on the pretest and posttest results in Table 1, it can be seen that the average level of community understanding regarding the training and practices that have been implemented and the community's enthusiasm for participating in activities during the program at the initial stage of the activity was only 30%. After training, the level of understanding and ability of participants evaluated at the final stage of the activity was 95.83%. This indicates that there has been an increase of 65.83% in the public's knowledge and understanding of the material and also the practice of integrated farming based on the web-based agromap info provided.

Discussion

Indicators of success of the training program according to (Darmawati et al., 2008), namely if at the final stage the activity produces data that the percentage of people who know, understand and are able to implement the technology provided is at least 80%. Thus, based on the evaluation results presented in table 1, it can be said that the objectives of this community service activity have been achieved. With more than 95% of partner communities able to understand well the integrated agricultural technology based on the web-based agromap info provided. The increase in understanding and skills of partners from 30% to 95.83% shows that the partner community is ready to develop integrated agriculture based on the web-based agromap info from a household scale to a commercial scale. Indicators in the field can be seen that the partner community is very active and enthusiastic in asking questions and discussing, making it easier for the team to implement the program. Apart from that, partner communities are able to express ideas and create desired innovations regarding the development of healthy vegetable cultivation techniques that are integrated with aquaponics.

Conclusion

Technology aquaponics opens opportunity for partner for increase income family through business integrated cultivation fish with vegetables. Technology This has become solution in overcome problem adequacy food. the average level of community understanding regarding the training and practices that have been implemented and the community's enthusiasm for participating in activities This indicates that there has been an increase of 65.83% in the public's knowledge and understanding of the material and also the practice of integrated farming based on the web-based agromap info provided.

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Reference

Faradisa, F., Katrini, Y. E., & Baihaqi, I. (2018). Balesari Culture And Language (Bcl) Sebagai Katalisator Desa Wana Wisata Balesari. *Dimas: Jurnal Pemikiran Agama untuk Pemberdayaan*, *17*(2), Article 2. https://doi.org/10.21580/dms.2017.172.2001

Hamzah, A., Alwi, L. O., Salahuddin, S., Wunawarsih, I. A., Jayadisastra, Y., & Hisein, W. O. S. A. (2023). Pemberdayaan Masyarakata Melalui Diversifikasi Inovasi Pengelolaan Hasil Pertanian Dalam Mendukung Ketahanan Pangan Dan Pertanian Berkelanjutan: Bahasa Indonesia. *Jurnal Pengembangan Inovasi Dan Pembangunan Masyarakat*, *1*(2), 69–73. https://doi.org/10.56189/jpipm.v1i2.23

Junaidi, Y., Wulan Sari, D., & Kholek, A. (2024). Pemberdayaan Masyarakat Melalui Inovasi Pertanian Terpadu di Pulau Kemaro Kota Palembang. *Jurnal Locus Penelitian Dan Pengabdian*, *3*(2), 209–217. https://doi.org/10.58344/locus.v3i2.2470

Marini, M., Mustikarini, E. D., & Khodijah, N. S. (2024). Upaya Penerapan Pertanian Berkelanjutan Melalui Penerapan Konsep Zero Waste Di Lahan Pasca Tambang Timah. *Enviagro: Jurnal Pertanian Dan Lingkungan*, *10*(1), 1–9. https://doi.org/10.33019/enviagro.v10i1.4795

Michelle, M., Manurung, P., & Octarino, C. N. (2023). Konsep Pengembangan Pertanian Pangan Modern Berkelanjutan di Kabupaten Sleman. *Jurnal Linears*, *6*(1), 64–73. https://doi.org/10.26618/j-linears.v6i1.10736

Mujiburrahman, M., Irawan, H., Suprapto, M., Muttaqin, R., & Irfansyah, M. (2024). Pelatihan Pembuatan Aquaponik Dalam Upaya Membantu Masyarakat Memahami Dan Memanfaatkan Sistem Pertanian Terpadu. *Jurnal Pengabdian Al-Ikhlas*, *10*(1). https://doi.org/10.31602/jpaiuniska.v10i1.12603

Nurfatiyah, P., & Jamaluddin, J. (2018). Desain Media Penyuluhan Untuk Penyuluh Pertanian Berbasis Website Di Kecamatan Berbak Kabupaten Tanjung Jabung Timur. *Journal of Agribusiness and Local Wisdom*, *1*(1), Article 1. https://doi.org/10.22437/jalow.v1i1.5452

Pratiwi, N., Syahfitri, J., & Andesta, M. (2021). Penyuluhan Sistem Pertanian Terpadu Dan Pemanfaatan Lahan Kosong Di Pekarangan Rumah Bagi Masyarakat Di Kabupaten Bengkulu Tengah. *Jurnal Ilmiah Mahasiswa Kuliah Kerja Nyata (Jimakukerta)*, *1*(1), 69–73. https://doi.org/10.36085/jimakukerta.v1i1.2479

Sihombing, Y. (2022). Penerapan Inovasi Teknologi Pertanian Berbasis Sistem Usaha Pertanian Inovatif Mendukung Ketahanan Pangan. *Proceedings Series on Physical & Formal Sciences*, *4*, 461–467. https://doi.org/10.30595/pspfs.v4i.537

Sugiharto, B. H., Solekan, M., Muslimin, Moh., & Hamzali, S. (2023). Pengaruh Peran Manajemen Produksi dan Faktor Lingkungan dalam Meningkatkan Efisiensi dan Keberlanjutan Usaha Peternakan Sapi di Jawa Timur. *Jurnal Multidisiplin West Science*, *2*(11). https://doi.org/10.58812/jmws.v2i11.784

Wilis, L. (2022). Pertanian Biodinamik: Studi Kasus Sistem Produksi Anggur Alternatif di Ihringen, Jerman Selatan. *Lembaran Antropologi*, *1*(1), 83–98. https://doi.org/10.22146/la.3533