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Community-Based Business Technology to Improve Village Independency in Sumedang Regency

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Keywords : Agricultural Entrepreneurship, Communitybased Learning, Mobile-based Solutions, Rural Development, Technology Integration. Abstract: The Desa Mandiri program, initiated by the Sumedang Regency Government, aims to enhance rural welfare and economic independence. A significant example is Cipari Village, where the Bhakti Insan Motekar (BIM) Foundation fosters agricultural entrepreneurship through community-based learning. However, sustainable agricultural development requires more than food security-it necessitates social inclusion and environmental resilience. This research proposes a Community-Based Business Technoloav model to support villaae independence, focusing on three key parameters: Technology Integration Requirements (TIR), Technological Training Methods (TTM), and Monitoring & Evaluation Mechanisms (MEM). A qualitative approach using participant observation and the Most Significant Change (MSC) method was employed to assess stakeholder perspectives, including government and foundation representatives. Findings highlight the need for technological adaptation among small-scale farmers, interactive training methodologies, and structured monitoring mechanisms. The study suggests a mobile-based technology solution as an initial step toward digital integration. Further, collaborations between government, foundations, and educational institutions can enhance capacitybuilding initiatives. The Koperasi model emerges as a viable framework for structuring farmer participation and monitoring progress. These findings contribute to developing scalable strategies for rural economic independence, balancing technological advancement, education, and policy support for sustainable agricultural ecosystems.



Introduction

Desa Mandiri is a program created by the Sumedang Regency Government, with the aim of improving the welfare of the people in the region, especially those living in rural areas. Based on information from the Sumedang Regency Government, by 2023 the number of villages that have been categorized as independent will reach 187 villages, and is expected to increase every year (Wahidin, 2024). One of the villages that has been categorized as independent is Cipari Village located in Jatinunggal District, in this village there is a foundation called Bhakti Insan Motekar (BIM), BIM was established by Dr. Ir. Kartib Bayu, M.Si in 2021, to help villagers achieve independence, by creating a Community Learning Center that can be used by local residents or communities, so that they can gain knowledge and higher educational status. One of the scientific aspects taught by BIM to its students is agricultural science, where in this field students are taught how to become an Agricultural Entrepreneur (Agropreneur), starting from the crop production process to the product marketing process (Bayu, 2024).

On the other hand, a research explains that food security alone is not enough to transform an Urban Agriculture area into Urban Sustainability, but the area must also be able to create good Social Inclusion and Environmental Resilience in its region (Tapia et al., 2021). Another research explains that one of the important things that can prove that Social Inclusion has been well implemented in the Agricultural Industry is when all stakeholders involved there are able to use technology because the technology they use is created not only in terms of advancement, but also in terms of the ease to be used by its users (Rose et al., 2021). As for the Environtmental Resilience aspect, Rose et al. (2021) explains that to achieve this, the technology created must meet the needs of the planet or not cause environmental damage.

In this research, the author wants to help Sumedang Regency increase village independence in their area, by designing a Community-based Business Technology concept. From the results of the literature study, the author found that there are 3 parameters that must be analyzed first, to be able to find the best solution that can increase the level of village independence. First Technology Integration Requirements (TIR), this parameter is a parameter used to measure how appropriate the technology used is for its users because in reality good technology is not only measured in terms of the advanced side, but also measured in terms of ease to use. Second Technological Training Methods (TTM), which is a parameter that measures how precise the knowledge transfer methods used are, in terms of educating users so that they can easily understand how to use a technology. Third Monitoring & Evaluation Mechanism (MEM), which is a parameter that measures how effective the monitoring and evaluation process is, so that the production process in an industry can be carried out effectively and efficiently.

Research Method

This research is designed using a qualitative approach to determine the needs of business technology in an independent village, based on the point of view of the Sumedang

Regency Government and the Bhakti Insan Motekar Foundation. The data collection method that the author will use is to use the Participant Obssevation data collection method, where the author makes observations by recording all the needs of an independent village, based on the presentation of the Foundation and the Government in a meeting. I chose this collection method because in this method the researcher is directly involved in the process of activities carried out by the community, with the aim of observing their behavior, interactions, and culture, during the activity, so that the researcher gets an advantage in the form of holistic data, from the stakeholders who are the object of research (Kang, 2021).

Furthermore, the data that the author has collected will be processed by using the Most Significant Change (MSC) tool. Most Significant Change is a tool used to observe changes in social conditions in a group or community, this tool can help researchers evaluate changes, by accommodating an information perspective from various stakeholders in the group or community (The Challenge Initiatives, 2019). This tool categorizes the research findings by dividing them into Current Situation and Expected Outcome, this aims to find out the gap between the two, so that it will make it easier for the author to determine the steps that must be taken in stages, so that the solution to be applied is visible for implementation.



Figure 1. Research Design Flow

Result and Discussion

Observation Result

The Government explained more about their desire to realize his program called "Desa Mandiri", so that the expectations he hoped for the development that would be carried out by the Foundation, were not only limited to agricultural production, but could be further developed for other sectors, such as renewable energy and green technology to preserve the environment. However, they also explained more about the needs of the agricultural sector, in terms of new farming methods that do not require large land because according to his information, traditional methods really require large land for one type of agriculture, while the majority of farmers in Sumedang Regency are small farmers, so a solution is needed that can make these farmers grow a variety of foods, but with little land.

The results of research observations that the author conducted in a meeting between the Foundation and the Government can be seen below:

Category	Current Situation	Expected Outcome
Technology Integration Requirement	 Government want agriculture tech not only focus in food security, but also environmental sustainability Government saw that farmers still rely on traditional methods 	 Government can expand their subsidies to support agricultural technologies The "Desa Mandiri" program can be realized New Innovation for small scale farmer
Technological Training Methods	 Government currently train communities through their Vocational Training Center Government are willing to collaboration with any organization, however, the roles in the collaboration must be clearly defined 	 Government community centric collaboration can be established through an effective partnership, with Communities, Foundations or Universities
Monitoring & Evaluation Mechanism	 Government relies on direct supervision, since there isn't effective remote evaluation system yet 	 Government can have a developed remote monitoring systems

Table 1. Government Perspective

The Foundation explained they already has used hydroponics technology to increase their agricultural production, besides that they also see that there are problems experienced by older farmers in adapting to using the technology. so they expect a technology that is easy to use for various groups, In addition, they also hope that with the development of technology, they can provide a new solution to the problem of sales and marketing of farmers because based on incoming reports, many farmers do not encourage their children to enter the world of agriculture because of the difficulty of selling crops, which results in them becoming less prosperous. They also explained that people understand much better when trained using practical methods rather than theoretical ones, so they hope that there will be development of this practical method, in accordance with the technology to be developed. Lastly for monitoring the Foundation explained that they did not conduct direct monitoring because it was already done by the government, so what they are currently doing is opening a discussion that can be followed by the community and the government, so that they can provide input to each other in the forum, In addition, they are also currently trying to design a cooperative to develop their business because according to state regulations, the Foundation is not allowed to do business, so they also hope that with this Koperasi they will be able to engage with the community more deeply, by inviting them to become partners of the Foundation, this will certainly make it easier for them to supervise farmers' businesses directly.

Category	Current Situation	Expected Outcome
	1. Foundations implement	1. There are new tech that can
Technology Integration Requirement	 hydroponics system to increased their crop productivity 2. Based on Foundation supervision, tech adapation still a challenge for older farmers 	 help remote farming 2. Foundations can engage the younger farmers 3. There are new solutions for sales and marketing
Technological Training Methods	 Based one Foundation experience, practical trainings are more recommended than the theoretical approaches 	 Expand their hands on training Expand their community learning center to other village
Monitoring & Evaluation Mechanism	 Foundations share informal feedback through forums their conducted Foundations has limited formal supervision Foundations plan to create Koperasi, in order to increase their formal supervision 	 Collaborate more with government for more formal Monitoring & Evaluation Mechanism Strenghten their Koperasi roles in the community

Technology Integration Requirements

In order to improve the growth of the agriculture industry, there is a need to invest heavily in technologies that are capable of assisting humans in conducting real-time monitoring evaluations, with large amounts of data such as IoT Networks and Cloud Computing (Mühl & Oliviera, 2022). This is necessary because the agricultural industry is a product industry, where their success is determined by how effective and efficient the production process is.

In addition, Mühl (2022) also explained that in addition to investment needs, there are other needs needed to demonstrate the success of these investments such as cross-sector collaboration between industry, government, and research institutions, and education and training programs are also needed so that farmers are able to adapt to the technological advances they will use.

Collaboration with the government is needed because the use of smart technology requires redefining clearer policies, so that it is not misused (Khan et al., 2021). Clear policies must be implemented because the use of technology that can be applied is certainly not limited to the production process, but can also be utilized in the sales process by the industry, such as the use of smart technology to help farmers sell their products to consumers at fair prices.

Based on the observation of all perspectives, the author finds a midpoint solution where the technology created can be made in stages from food production to technology that supports the independence of villagers, besides that the technology created must be easy to use by the community, so the technology recommendations that can be made first are mobile-based technology. This technology might open up a new alternative method of farming, which could be a selling point for the Koperasi among farmers.

Technological Training Methods

Education and training programs are needed not only so that farmers are able to use technology, but also to prevent inequalities for small farmers or marginalized communities in benefiting from technological advances (Rose et al., 2021). This makes sense as another reason why education is necessary because in reality, not all farmers around the world have the opportunity to pursue higher education and it is possible that they can be exploited by irresponsible parties.

On the other hand, when this education process is carried out, there will certainly be challenges that need to be anticipated such as resistance to change or modernization because people may already feel comfortable with what they do with traditional methods (Sedyastuti et al., 2020). To ensure that this rejection does not become a threat, a careful planning is needed so that they understand that the changes that occur not only take them out of their comfort zone, but move them from their comfort zone to a zone that will be much more comfortable in the future.

Based on the observations of all perspectives, the author finds a middle point where the practical training method that is usually carried out by the Government and the Foundation, can be developed again to be more interactive, besides that training can also involve students from the University, as additional manpower assistance.

Monitoring Evaluation Mechanisms

To ensure the sustainability of the process of increasing the growth of the agricultural industry, a good Monitoring and Evaluation mechanism is also needed. Good Monitoring and Evaluation is determined by how systematic the evaluation is, starting from being able to explain how agriculture contributes to food security such as Food Security, Social Inclusion, and Environmental Resilience (Tapia et al., 2021).

Tapia et al. (2021) also explained that the biggest challenge always faced in conducting monitoring and evaluation in urban agriculture is the complexity of the indicators because to obtain accurate data in urban agriculture, an indicator with a very broad scope is needed, and it is not uncommon to collect data for evaluation using traditional methods, which is the result of the large technology gap in urban agriculture.

Based on the observations of all perspectives, the author finds a middle point where the Koperasi can be the center point of Monitoring and Evaluation of agricultural businesses, the mechanism is to create a partnership between Farmers and the Foundation first, so that the Foundation has more reason to supervise them, besides Farmers can also have a place to consult if they need further assistance, finally the results of this evaluation can be presented to the government, either directly in a discussion forum that might be done remotely.

Conclusion

The Desa Mandiri program in Sumedang Regency has demonstrated the potential of rural communities to achieve economic independence through technological integration and structured learning. The Bhakti Insan Motekar (BIM) Foundation plays a crucial role in equipping villagers, particularly small-scale farmers, with knowledge and skills in agricultural entrepreneurship. However, the research findings emphasize that mere access to technology is insufficient; instead, it must be accessible, user-friendly, and tailored to the needs of diverse farmer demographics. To ensure sustainable development, a Community-Based Business Technology approach is proposed, incorporating Technology Integration Requirements (TIR), Technological Training Methods (TTM), and Monitoring & Evaluation Mechanisms (MEM).

A key insight from this study is that technological training and adoption must be interactive and inclusive. The government's existing vocational training centers provide a strong foundation, but a more practical, community-driven approach is necessary. This can be achieved through hands-on training sessions and active collaboration with universities and research institutions. Additionally, challenges such as resistance to change and the generational divide in technology adoption must be addressed through structured knowledge transfer mechanisms. A mobile-based solution is recommended as an entry point to make agriculture technology more accessible and scalable.

Furthermore, ensuring long-term sustainability requires a well-defined monitoring and evaluation system. The Koperasi model can serve as a centralized framework for overseeing farmer engagement, business transactions, and policy implementation. Strengthening partnerships between the government, foundations, and local communities will enhance transparency and provide continuous feedback loops for improvement. By integrating these findings, Sumedang Regency can establish a replicable and scalable model for other rural regions, promoting economic resilience, technological adaptation, and sustainable agricultural development.

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