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Implementing the Rural Digital Transformation Policy through the Smart Village Program in Indonesia, Case Study of Salu Dewata Village, Enrekang Regency

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Article History	Abstract
Received: 01 June 2023 Revised: 07 Aug 2023 Accepted: 27 Aug 2023	<p><i>This research aims to examine: a) the current condition of the digital ecosystem in rural areas as they transform into smart villages; b) the implementation process of the rural digital village program; and c) the prospects for developing agriculture-based smart villages. The research method employs a qualitative approach using case studies, strengthened with analytical models of organizational theory, particularly the open systems theory introduced by Ludwig von Bertalanffy. The findings reveal that the introduction of internet infrastructure into the village, and the digital ecosystem in Salu Dewata village has generally developed quite well. However, the Internet's functions for strategic economic development, such as the digitalization of the agricultural sector, are still largely limited to personal communication. Its use for strategic activities such as agriculture remains minimal. since being designated as a Smart Village participant in the Ministry of Village Development for Disadvantaged Regions and Transmigration, Salu Dewata Village has established a Village Digital Community Space (RKDD). This institution is developing a village website service that includes general village information and community economic opportunities. Meanwhile, the implementation of digital transformation in the agricultural sector is under consideration, given the significant prospects for developing agriculture-based smart villages. This village is a center for shallot plantations but faces numerous challenges such as climate change, labor shortages, post-harvest prices, and low income due to these issues.</i></p>
CC License CC-BY-NC-SA 4.0	Keywords: Smart Village, Agriculture 4.0, Supply Chain, Sustainable Agriculture

1. Introduction

Since the introduction of the internet in villages, the development of digital ecosystems in rural areas has also progressed. (Viswanadham & Vedula, 2010) Technology acts as a catalyst for development, enabling the involvement of village communities (Ranade et al., 2015). Technology plays a role in enabling small-scale farmers to reduce various obstacles to participating in the agricultural value chain. (agricultural value chains). (Smidt, 2021) Of the 83,218 villages or sub-districts throughout Indonesia, 70,670 areas are confirmed to be able to enjoy the 4G network, this number has entered the 3T area. (Kominfo, 2020) This causes internet usage in Indonesia to be very high. This makes internet rates cheap, and the number of smartphone users reaches 167 million people or 89% of the total population of Indonesia (Kominfo, 2020).

This increase in internet users provides a great opportunity to support the smart village ecosystem. Based on the results of the latest survey by the Indonesian Internet Service Providers Association (APJII), the number of Indonesian internet users has reached 210 million. In the latest server findings, the internet penetration rate in Indonesia grew by 77.02%, where there were 210,026,769 people out of a total of 272,682,600 Indonesian people who were connected to the internet in 2021.

Compared to previous years, there was a spike in internet penetration in homeland. For example, in 2018, penetration was 64.80%, which then continued to grow in 2019-2020 with internet penetration of 73.70%. (APJIII, or.id, 2022). It is a development ecosystem, especially the rural digital sector in Indonesia.

Several previous studies see the need for inclusive technology to support organizational innovation. (Xie et al., 2021) and the need for ecosystem management for a village and then mapping out integrated design procedures to build a smart village. (Viswanadham & Vedula (2010) The state's role in governance and institutional support is very important to facilitate collaboration and participation of various actors. There is a need for a comprehensive local development implementation framework that can support the adoption of digital solutions to support small-scale farmers. (Smidt, 2021) If not managed well, digital transformation in agricultural practices can cause a digital divide. The digital wave is a great opportunity for poor people to bridge the gap between rich and poor. (Zhang et al., 2021) A number of other studies see the great potential for digital transformation of the agricultural sector. The agricultural sector in Low Middle Income Economics (LMICs) countries employs more than 80% of the rural population, the agricultural sector is considered a significant driver of economic growth in many countries. (Chandra & Collis, 2021) Agriculture has an important role in contributing to rural economic growth and ensuring food security. (Masuku et al., 2017). The agricultural sector has two difficult tasks, namely providing food and helping people get out of poverty. (Gassner et al., 2019).

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The government can make a breakthrough by encouraging the digitalization process of the agricultural sector based on Agriculture 4.0 technology. (Gautam et al., 2021) Digital solutions enable small farmers to gain various benefits and gain access to real time prices, markets, and agricultural information and secure financial transactions, alternative value chain relationships, multi-aspect knowledge, better income and yields, reduced costs, social welfare and risk minimization, benefits of women's empowerment. (Kudama et al., 2021) By digitalizing agriculture, small farmers can reduce risks, increase productivity, increase incomes and help solve the upcoming challenge of producing enough nutritious food for the world's rapidly growing population. (Chandra & Collis, 2021) Technology can also increase crop production and improve tracking, harvesting, processing and marketing in real time. (Naresh et al., 2020). A diversified production system allows them to achieve food security in the 2020 pandemic year. (Barbon et al., 2022)

However, it cannot be denied that on the other hand there are also several obstacles to implementing this concept, including the low openness of rural communities to change, low innovation capacity and low levels of social capital, low local market capacity, spatial distance, transportation networks and underdeveloped communication. (Guzal-Des, 2018) The government has issued various policies and strategies for village development in Indonesia, one of which is carrying out rural digital transformation efforts through the smart village program. For this reason, it is necessary to look further into this effort, including: a) by looking at the current condition of the digital ecosystem in rural areas in transforming towards smart villages; b) How is the rural digital village program implemented; and c) what are the prospects for developing smart villages based on agriculture?

2. Material and Methods

Area Study

Saludewata Village, Anggeraja District, Pasui Village, District. Buntu Batu Enrekang. One of the villages that has been declared a Smart Village by the second phase of the PDTT Village Ministry. This research uses the following procedures: a) collect relevant data and appropriate concepts or theories; b) the collected data and concepts are sorted and selected which have relevance to the research topic. Data sources come from farmers, village government, Digital Community Space (RKDD), Digital Cadres, and Digital Ambassadors. Apart from that, it is enriched by related agencies, the Ministry of Villages and the Ministry of Information and Communication, Regional Government, Village Government, P4S, and many more. Data Collection Method is primary data obtained by researchers through field data collection activities/research objects, such as interview results, observation results, and FGD results. Primary data is collected from various reports, media reports, and so on. Time The research was conducted in January-April 2023.

Analysis Techniques

The method used in this research is a qualitative method through a case study approach. (Creswell, 1998; Creswell, 2014; Hollweck, 2016; Yin, 2002); Kusmarini, 2020; Sandelowski, 2000). The analysis technique used in this research is based on the case study method, namely: (1) collecting categories, looking for a collection of data examples and finding meaning that is relevant to the issue that will arise; (2) direct interpretation, looking at one example and drawing meaning from it without looking for many examples. This is a process of pulling data separately and putting them back together to make them more meaningful; (3) forming patterns And looking for equivalence between two or more categories. This research is supported by an organizational theory perspective, especially the open systems theory introduced by Ludwig von Bertalanffy (1992), which is used to view villages as an open *system*. Analysis is carried out through a combination of inductive and deductive methods. Initially, researchers tried to build patterns, categories, and themes from the bottom up (deductively), by processing data into information units abstractly, repeatedly until a complete set of themes was found. After that, the existing data is looked at again, to determine more evidence that can support each theme, and see the need to combine it as additional information. (Creswell, 2014)

3. Results and Discussion

Rural Environmental Conditions and the Transition to Smart Villages

Salu Dewata is one of 15 villages designated as a Second Phase Smart Village by the Ministry of Villages for Development of Disadvantaged Regions (Kemendesa PDTT). This village is located in the Duri area, the highland area of Enrekang Regency, which is at an altitude of 900 -1200 meters above sea level, with an average slope of 30-40 degrees. The area of the village is 13 km², most of which is used as agricultural land, specifically for shallots approximately ± 120,000 m², plantation crops such as cloves, cocoa, and snake fruit around 80,000 m², and other crops around 200,000 m². This village is inhabited by around 1,275 people from 360 heads of families, including 652 men and 623 women. The majority of the population works as farmers. (Source: Saludewata Village Office)

The vision of Salu Dewata Village is "To make Salu Dewata Village a village center for horticulture and fair community services with quality resources towards a developed, safe and prosperous village". This village hopes to accelerate development through the Smart Village program. On the Developing Village Index (IDM) scale, Saludewata is included in Developing Village Status with an index score of 0.6349 in (2022). The target for this village is to become a developed village with an IDM score of 0.7073. The main economic potential of Salu Dewata Village is agriculture, horticultural crops such as shallots and chilies, as well as plantation crops such as coffee and cloves. Onion production per year is estimated to reach 1,000 tons per year. Horticultural agriculture is the most important economic sector in this village. (digital desk. id, 2023)

From the naked eye, the land in this area is difficult to use as agricultural land, because this area consists of rocky land, and many white coral fragments are scattered on the ground. However, thanks to the tenacity of farmers, this rocky land can be processed into growing areas for shallots, chilies, and other horticultural crops. The coral stones that are spread on the ground are removed to the edge of the garden, then the rocky land can be cultivated using a small hand tractor. Except for making beds, they still use a hoe. The level of onion productivity here is quite high, the yield can reach 20 tonnes per ha, double that of cultivation in general. The onion seeds planted are lime varieties, which are suitable for slightly wetlands, so they are resistant to rain. Meanwhile, other varieties, such as Bima, are somewhat vulnerable to rain. The cost of cultivating shallots is around Rp. 20 million for an area of 30 acres.

In terms of innovation, the development of the shallot cultivation business in Saludewata Village is quite advanced. This progress was marked by the use of a land irrigation system with a network of pipes that channeled water to the gardens. Apart from that, farmers also use pest traps made from lights to overcome plant pest problems. This is visible at night with the sparkling lights spreading in all directions. Watering is done using a water wheel to make watering easier. Water from the mountains or springs is channeled using a ¾ inch plastic hose. The irrigation system is becoming more massive due to the development of retention basins that can hold water around the garden. The

construction of the bung began when the heavy equipment rental business such as excavators entered the business in 2010. Thanks to the bung building, with the help of a water pump machine, watering can be done to the garden which is higher than the water source. This breakthrough caused the shallot plantation area to become increasingly wider.

Before the use of this irrigation technology in 1994, farmers watered manually throughout the day, from morning to evening. As a result of the difficulty of irrigation at that time, only about 5 people were farming. Currently, with the discovery of irrigation technology, almost all farmers are planting onions. The obstacles currently faced are a lack of water channel infrastructure, the cost of repairing irrigation, many of which are not suitable for use, due to weak maintenance, causing water to be unevenly distributed to all farmers, silting of reservoirs which requires costs in the repair process. Another problem is the road to the garden which can make it easier to sell the harvest.

The problem that often threatens crop failure is the problem of climate change which is difficult for farmers to predict. The impact is the problem of high rainfall, drought, and plant pests. Apart from that, fertilization is a determining factor in planting shallots. This causes farmers to have to use quality fertilizer to get good harvests. There is a tendency for farmers to buy fertilizer using expensive but quality fertilizer rather than cheap but poor quality fertilizer. The fertilizers that are widely used are imported fertilizers such as Nitro Ponska, DGW gold, DGW Booster, and others. The reason is that this fertilizer is absorbed very quickly by plants, while subsidized chemical fertilizers are less attractive to farmers. Organic fertilizer in the form of chicken manure is also widely used as a soil loosener.

When the harvest arrives, the problem that arises is the lack of labor, the need for agricultural labor or casual daily workers is very much needed, sometimes even not enough for Salu Dewata Village itself, so they use labor from outside the village. This condition makes farmers queue to get labor because the number of onion plants and labor is not balanced at harvest time. Women and children also work as seasonal laborers during the onion harvest, because the need for labor increases. As they are known, shallots cannot be harvested late. Shallots have a high water content, rot quickly, and need extra care after harvest. So if it is not done quickly, farmers could experience losses. Problems like this continue to recur every year. Meanwhile, harvesting technology for shallots does not yet exist. Farmers in Salu Dewata are challenging how there is a technology that can help make it easier for them to harvest shallots.

Another problem is that market prices often drop during harvest, prices can fall to IDR 10,000 per kg. In conditions of falling prices like this, we have to sell it, because if they hold it, they could lose even more. Shallots contain a lot of water, so they can shrink very quickly. In one month it can shrink by up to 50 percent. During the peak harvest season, traders buy at very cheap prices, even though in the city prices are still quite high. The price of shallots in the city is never below IDR 30,000 per kg, but in villages, the price can fall below IDR 10,000 per kg.

So, even if the farmer's cultivation is quite successful, the farmer will not necessarily get satisfactory results. Problems such as low prices at harvest, high prices of seeds and fertilizer, capital from moneylenders, high labor costs, and irrigation costs, make farmers' incomes very small. This causes farmers to remain poor, many people go to the city to look for work, purchasing power is low, and so on. The position of Salu Dewata Village is very important as it supports the need for shallots in the eastern region of Indonesia. The people of Salu Dewata want an intelligent solution to overcome the problems they face.

Implementation of Smart Village Policy in Indonesia

Determination of Smart Villages by the PDPT Village Ministry

In 2022, Salu Dewata Village was designated as a participant in the Smart Village program of the Ministry of Village Development for Disadvantaged Regions and Transmigration (Kemendes PDPT) of the Republic of Indonesia, through a Decree from the Head of the Village, Disadvantaged Regions and Transmigration Development and Information Agency. Overall, as many as 3,000 villages from the P3PD Regency were designated as Smart Villages, taking into account representation in the Western, Central, and Eastern parts of Indonesia. This determination is divided into three phases,

Phase I in 2021 with a total of 350 villages, Phase II in 2022 with a total of 1,000 villages, and Phase III in 2023 with a total of 1,650 villages. The working period of the smart village program is 2 years.

The background for determining these villages as Smart Villages is to encourage innovative village development in solving problems by utilizing digital technology. Smart Village activities are part of the 2021-2024 Program for Strengthening Village Government and Development (P3PD). Through this program, it is hoped that it can encourage the use of information and communication technology to become one of the priority sectors in the use of village funds which is prioritized for achieving the Village SDGs.

Another consideration is related to the readiness of these villages in terms of internet infrastructure that can support the development of the rural digital sector. Saludewata was included as a participant in the smart village program because it is connected to the internet. Even though the village is a bit remote, around 5 km from the provincial road axis, around 50 km from the district capital, or around 250 km from the provincial capital, the internet network is quite good in Salu Dewata Village. Some residents already use smartphones and Android and use various social media applications that are known to the public.

After being determined to be a Smart Village participant, mapping is then carried out based on the problems, potential, and characteristics of the village. Villages identified as tending to be related to trade and agricultural issues may be directed towards developing the economic sector, while villages that tend to have problems related to educational issues may be directed towards literacy programs or villages which have problems in terms of services will be directed towards in the development of service systems, villages which have a lot to do with environmental problems, are likely to be directed towards improving environmental quality, and so on.

Establishment of Village Digital Community Space (RKDD)

After being designated as a participant in the smart village program, Saludewata Village formed a Village Digital Community Space (RKDD) through Village Head Decree No. 06 of 2022 concerning the Salu Dewata Village Digital Community Space (RKDD). This space can be used by the community to learn, discuss, and create innovative solutions based on digital technology as well as a means of improving community skills in managing village resource potential. This community brings together communities in the village, to serve as a basis for carrying out the digital transformation process. All communities in the village can join this space.

Several communities that are members of the RKDD in the village include Karang Taruna organizations, Farmers' Groups, Tourism Awareness Groups, PKK, MSMEs, and others. Interactions in the RKDD can take the form of discussions, planning Smart Village activities, increasing community capacity and strengthening skills as well as strengthening community digitalization literacy. The activity methods in the Village Digital Community Space can be face-to-face or virtual activities. Face-to-face activities can be carried out as meetings in a room, while virtual activities can be carried out through the use of online applications on the internet. Apart from being carried out in one of the rooms of the village office building, it is also directly in the field where the theme is adapted to the context and substance, such as activities to strengthen farmer groups which can be carried out in rice fields or plantations, PKK women can develop skills in people's homes, health literacy implemented at Community Health Centers as well as IT literacy can be introduced in schools, etc. To support routine RKDD activities, the government has prepared a workspace that functions as a storage area for supporting Technology and Information (IT) infrastructure at the village office.

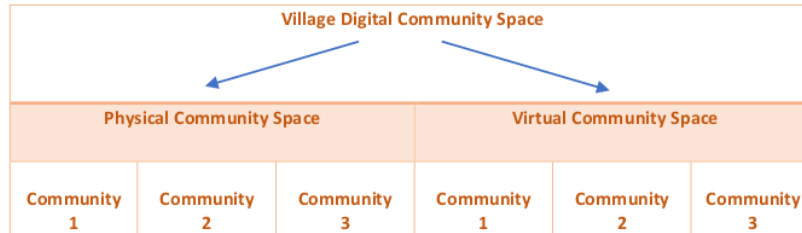


Figure 1: Village Digital Community Space Chart(Pusdaing Kemendes PDTT, 2022)

RKDD management is carried out by digital ambassadors, village government, digital cadres, village communities and volunteers. The Village Head as the Village area stakeholder in implementing development and community empowerment, coordinates with all parties including Ambassadors and digital cadres in the Village as well as other stakeholders, including providing guidance. The village head involves village representative bodies, village community institutions, and traditional institutions to hold participatory village deliberations that discuss plans for digital empowerment and digital literacy in the village in accordance with village needs as well as plans for technical guidance and assistance for the community and village community. Village institutions such as the Village Consultative Body, Village Community Institutions, Traditional Institutions, are also expected to play their role in supporting the existence of smart villages in preparing plans, listening to aspirations and helping the smart village program run smoothly. Organizational Structure The organizational structure of the smart village community space management team is as follows:

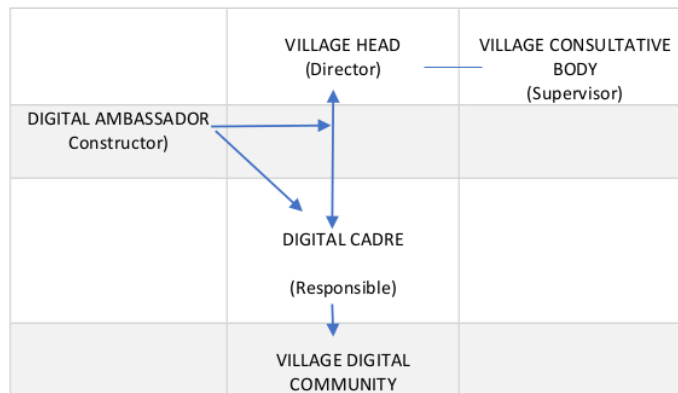


Figure 2: Structure of the Person in Charge of the Village Digital Community Space(Pusdaing Kemendes PDTT, 2022)

The role of the management team in the Village Digital Community Space includes: 1) The Village Head acts as a director whose task is to provide direction, considerations, suggestions, and/or opinions regarding the implementation of community space activities; 2) Digital Ambassadors as coaches who lead, coordinate, monitor and evaluate community space development activities in the village. 3) BPD as supervisor is tasked with carrying out supervisory activities overall activities in the RKDD; 4) Digital Cadre is responsible for all assets, planning and compiling RKDD activity schedules, facilitating all implementation of activities assisted by the head of the community discussion group, preparing reports on Village Digital Community Space activities. Meanwhile, the Village Digital Community plays a role in coordinating Village Digital Community Space activities with their community group members, assisting digital ambassadors and digital cadres in implementing Village

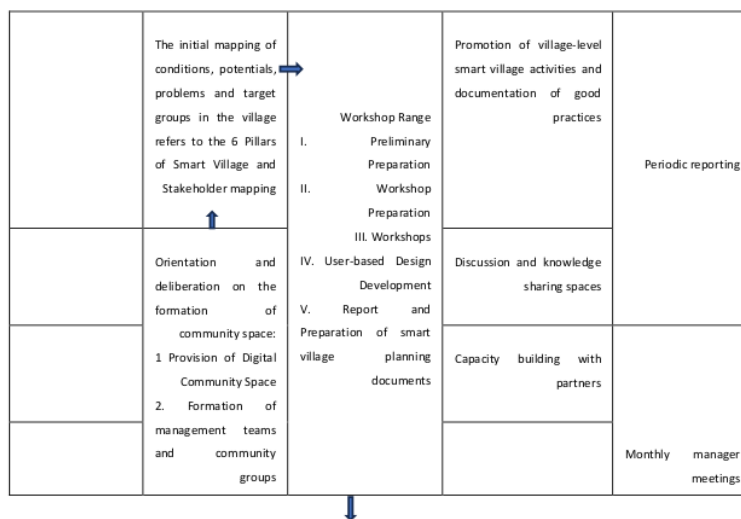
Digital Community Space activities related to target community discussion groups and representing the aspirations of their community group members regarding smart village activities.

Financial support for RKDD development comes from smart village activities at the PDTT Village Ministry, and other government and non-government institutions. Management is based on the provisions of aid providers and village financial management. 1) Operational support for the development of the Village Digital Community Space from the PDTT Village Ministry. Operation of the Village Digital Community Space is a daily activity for the utilization of the Village Digital Community Space which will be financed by the PDTT Village Ministry through the Development and Information Agency providing a budget of IDR. 20,000,000 (twenty million rupiah) every year for 2 (two) years. Operational funds for the Village Digital Community Room will be transferred by the Administrative Management Company (PPA) to the Village Digital Community Room account with disbursement requirements approved by the Commitment Making Officer (PPK) on the minutes of verification results by the Pusdaing Verification Team.

Meanwhile, for activities to increase digital literacy in village communities, the Competitiveness Development Center, Development and Information Agency, and Ministry of Villages PDTT will provide infrastructure support for the Village Digital Community Space worth IDR. 30,000,000 (thirty million rupiah) to each smart village locus which will be given to support the implementation of smart village activities and become an asset for the Village Digital Community Space. The smart village locus also received support for the implementation of the village Digital Community Space orientation, this orientation aims to socialize and implement the smart village program in the community. To carry out this activity, each village will receive funding support for Village Digital Community Space Orientation of a maximum of IDR 2,000,000 (two million rupiah).

Operational support for developing community spaces comes from the Village Fund. Villages can budget additional operational funds for the development of the Village Digital Community Space through a village development planning mechanism by the needs of smart village activities in the Village Digital Community Space. Meanwhile, non-governmental support can also participate, such as companies or private institutions through corporate social responsibility funds. The financing process in the process of providing services and managing community space can be agreed between the village government and the private sector.

This RKDD activity is carried out through several stages, starting from mobilization, preparation, participatory planning, implementation, and control. In its implementation, it can involve the entire community, community, village government officials, as well as partners who have the potential to provide ideas and concepts for developing smart villages and village development. It is in this space that every citizen's ideas are exchanged, discussed, and then produced public needs. The following is the implementation scheme for the Village Digital Community Space.



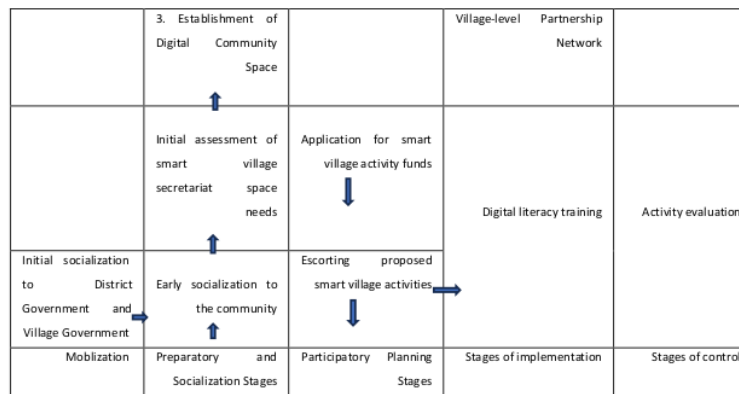


Figure 3: Implementation Scheme for Village Digital Community Space(Pusdaing Kemendes PD TT, 2022)

The mobilization stage is the initial initiation and socialization activities of the central government to the district government and village government, while the preparation stage includes initial mapping of village potential and problems referring to the 6 pillar principles, formation of the RKDD, and socialization to the community. After that, the Digital Ambassador together with the Digital Cadres prepared a participatory plan which was continued with the implementation stage, where the RKDD function started to run. The working principles of developing this smart village are: a) development, namely improving what already exists; b) strengthening to increase existing capacity; and c) innovate something that doesn't exist yet. This means that the smart village program does not have to start from zero, but can develop things that are considered good.

The most important thing to discover is potential and opportunity. The discovery of these potentials and opportunities can be an entry point or embryo for developing other pillars. Just as Salu Dewata's potential is in shallot farming and has the opportunity to digitize the irrigation system, RKDD can create programs that are closely related to shallots, such as making compost for fertilizer, making fried onions to increase added value, as well as creating a website and social media accounts for marketing shallots. So that one activity can give rise to subsequent activities from different pillars.

Villages as Open and Complex Systems

The issuance of Law No. 6 of 2014 concerning Villages, which is complemented by Implementing Regulation No. 43 of 2014 concerning Villages and Government Regulation No. 60 concerning Village Funds sourced from the APBN, has provided a strong foundation relating to the implementation of village government, implementation of village development, community development, villages, as well as village empowerment. If previously villages were more of a development target and part of the regional government system, with this regulation the village becomes a separate system as a *self-governing community* and *local self-government*. (Wijaya, 2018; Iskandar, 2020)

The village as an organizational system, the village consists of many system components that interact with each other to develop themselves and have their boundaries and authority, and are free to interact and provide feedback to the external environment around them. In this context, the village can be viewed as an open system. Goldhaber (1993) calls an organization an open system because of its constant interaction with its environment. Organizations receive inputs from their environment (workers, raw materials, information) and send outputs to the environment (products, services, pollution, information). Very few organizations can survive without paying attention to potential markets, suppliers, users, the public, and various regulations.

In the industrial era 4.0, villages are in a new ecosystem called the digital ecosystem, where villages are now connected to the global environment thanks to the presence of information and

communication technology. In a business context, ecosystems develop into very complex ones. (Moore, 1993), there is a complex interaction between competitive and cooperative business strategies. (Moore, 1993) The organization of a business ecosystem is to communicate to a collection of entrepreneurs a potential for collective action. (Moore, 2006)

In the village context, this ecosystem approach integrates: a) all responsible institutions; b) resources required, c) services to be provided; and d) technology and service delivery mechanisms. A village that can present all services, providers, and users on one platform can be called a Smart Village ecosystem (Viswanadham & Vedula, 2010).

The Smart Village Program promoted by the PDPT Village Ministry is a digital transformation process based on five 5 strategic steps, as follows: 1) Accelerating the expansion of access and improvement of digital infrastructure and provision of internet services; 2) Prepare a digital transformation roadmap around strategic sectors. Whether in the government, public services, social assistance, education, health, trade, industry, or broadcasting sectors; 3) accelerating the integration of national data centers; 4) Preparing digital talent needs; 5) Prepare regulations as soon as possible regarding funding and financing schemes. (Nurdin, 2022) The main objectives of the digital transformation process are 1) establishing and improving internet connectivity in rural areas; 2) spur and increasing digital economic growth through BUMDesa Bersama; 3) Increasing capacity by carrying out capacity-building activities in the context of technical training for human resources to develop digital/internet facilities and infrastructure.

Conceptually, this smart village program opens up hope for village development, but it must have a priority scale so that the results can be seen and must be based on solving community problems so that it can be sustainable. Village development through the smart village program can be achieved through the development of strategic sectors, such as the agricultural, maritime, and tourism sectors, etc. The agricultural sector has major potential because the majority of villages in Indonesia rely on agriculture as the backbone of the economy. So that the smart village program can be directed into an agriculture-based smart village program.

Digitalization and digital transformation in rural areas are important in creating inclusive recovery and helping rural areas overcome problems that arise in the economic, social, and environmental sectors. (Aritenang et al., 2022) Accelerating the adoption of digital technology with various implementation stages (Shabrinawati & Yuliasuti, 2020) The digital transformation strategy is projected to be able to overcome various problems in Salu Dewata Village, such as agricultural labor shortages, environmental problems, falling commodity prices, and so on. Labor can be overcome by using agricultural cultivation equipment based on IoT (Internet of Things), AI, etc. Environmental problems consisting of deforestation, land constriction, and pesticide residues, can be overcome with digitalization, because with digitalization, agriculture can save land use and input use but can still increase production.

One of the road maps for developing smart villages is towards independent village status. The Village Development Index (IDM) is an indicator used to measure the level of progress of a village in developing human resources and the local economy. IDM Achievement is a composite index that measures the level of achievement of social, economic, and environmental development. This index is a derivative of 17 SDGs which later became 18 Village SDGs which became the basis for forming 8 village development priorities. This index was developed by the Indonesian Ministry of Villages, Development of Disadvantaged Regions and Transmigration (Kemendes PDPT). One path taken is through digital transformation.

Rural development needs to adopt a smart approach to solve unique problems through innovative means and improve people's quality of life. One of the policies issued by the government through the Ministry of Villages PDPT to improve IDM, as well as achieve the SDGs is through a flagship program called Smart Village. Six pillars are targets for this achievement, namely Smart People, Smart Economy, Smart Governance, Smart Environment, Smart Living, and Smart Mobility. (mobility). The relationship between SDGs, the Village Fund Priority Program, and the 6 Pillars of Smart Villages is described as follows.



Figure 4: Road Map for Smart Village Development through the PDTT Village Ministry(Pusdaing Kemendes PDTT, 2022)

Smart people, namely people who are able to optimize social capital to strengthen the existence of village social forums, the spirit of self-reliance, and the empowerment of women and other marginalized groups in the village. In this case, it takes the form of investing in basic skills and knowledge to use the internet effectively to foster creativity and prosperity. One form of this is capacity development training for the community and village officials by utilizing technology. Meanwhile, Smart Governance (*Smart Government*), namely the use of digital technology, supports the provision of basic services and public services effectively. Governance that emphasizes the capacity of village officials, village institutional capacity, and the capacity to provide adequate basic services. Smart governance consists of several indicators, namely the provision of basic services, village institutional capacity and village apparatus capacity. One manifestation of smart governance is the ease of obtaining public services by using digital technology such as applications, websites and so on.

Then the Smart Economy *in* smart villages is the application of digital technology which is used as a tool in accessing markets and information sources, production lines and village distribution. A village economy that is strengthened by economic institutions and equal access to well-managed village economic resources, focuses on benefits that can be enjoyed together and sustainability. One form of this is the use of technology as a tool in developing Village BUM businesses, collaboration between villages and various parties to develop economic activities in the village. Next is the *Smart Environment*, namely digital technology as a means of supporting environmental sustainability goals through conservation and efforts to raise awareness of the use of digital technology as a medium for promoting sustainable and efficient natural resources. Village natural environmental governance prioritizes the principles of sustainability and responsiveness in preventing and managing disaster risks. This functions as an effort to fulfill the needs of local communities, such as information on energy consumption and exposure to pollution, community involvement in environmental activities and in the management of renewable energy and the use of innovative, sustainable technology. Forms of environmental implementation include waste management and waste management.

Then *Smart Living* is centered on investment in human resource and socio-cultural development with the hope of creating a good quality of life in terms of the availability and quality of public services, such as culture, education, health, safety, housing and so on. Quality smart life helps support life and social inclusion in village communities. Examples of smart living can be applied to health services, disabilities and so on. Then Smart Mobility, namely the application of digital technology with the hope that digital technology can increase the connectivity of rural areas with other regions in Indonesia. Village communities are expected to be given convenience in obtaining services, for example the availability of internet network infrastructure and innovative and safe transportation systems for the community.

The 6 Pillars of Smart Villages can be a guide for compiling a road map, where to orientate the development of each village that will become a smart village. Each village certainly has different problems, potential and advantages. So it requires different activity formulations. Digital transformation orientations have different emphases. The village digitalization model characterized by cities and villages will be different, as well as maritime and agricultural villages will also be different. So it is necessary to prepare a road map for each village.

From the results of the SWOT and TOWS Matrix analyzes that have been carried out, it shows that the strength of Salu Dewata village is agriculture, including deep-rooted agricultural cultural traditions. Meanwhile, the weaknesses are that cultivation is still conventional, capital and labor. On the other hand, there are quite large opportunities due to the growth of the digital ecosystem, such as online markets, as well as government regulations that favor rural areas, etc. Meanwhile, the threats faced are climate change, environmental degradation, and increasingly fierce competition. From this analysis it is concluded that the most reliable strategy is the development of digital transformation in the agricultural sector, because agriculture is an internal strength of the rural system of Salu Dewata Village, which can be transformed into an agriculture-based Smart Village.

Transformative Process in the Agriculture-Based Smart Village Program

The transformative process takes place when input is converted into output, in other terms it is often referred to as a throughput process. (Goldhaber, 1993) The transformative process in the smart village program refers to a series of significant changes that occur in program implementation to achieve the desired goals and results. This process involves transformation in the application of smart technology and changes in the way villages operate, provide services, and interact with their communities. The transformative process is aimed at managing all internal potential, exploiting opportunities from the developing external environment, as well as overcoming various existing problems such as poverty and unemployment, environmental degradation and limited land, government services, and so on.

The first step in the transformative process is establishing the goals and vision of the smart village program. This includes identifying the problem to be solved, the targets to be achieved, and the expected benefits for the village community. Once the objectives are set, the next step is to conduct a needs analysis to understand the challenges and opportunities that exist in the village. This helps in identifying the most appropriate smart technologies for use in the program. The main need is technology that can make farming easier, both upstream and downstream.

Based on the needs analysis, it is necessary to plan and design how smart technology will be implemented in the village. This involves establishing milestones, resource allocation, and implementation schedules. Transformative processes require adequate resources, including funding, hardware and software, as well as skilled and trained human resources. The implementation stage is when smart technology is activated in the village. Hardware and software installation, as well as training for village staff and communities to use technology effectively.

As an open system, each village can receive input from outside, and send feedback to the external environment, through the digital transformation process. Smart villages have a very diverse and extensive external environment. The external environment can be in the form of natural resources, culture and traditions, development of human resources, growth of the digital ecosystem, development policies, developments in science and technology, and so on. All of this can be channeled into input into the rural organization system with the following description.

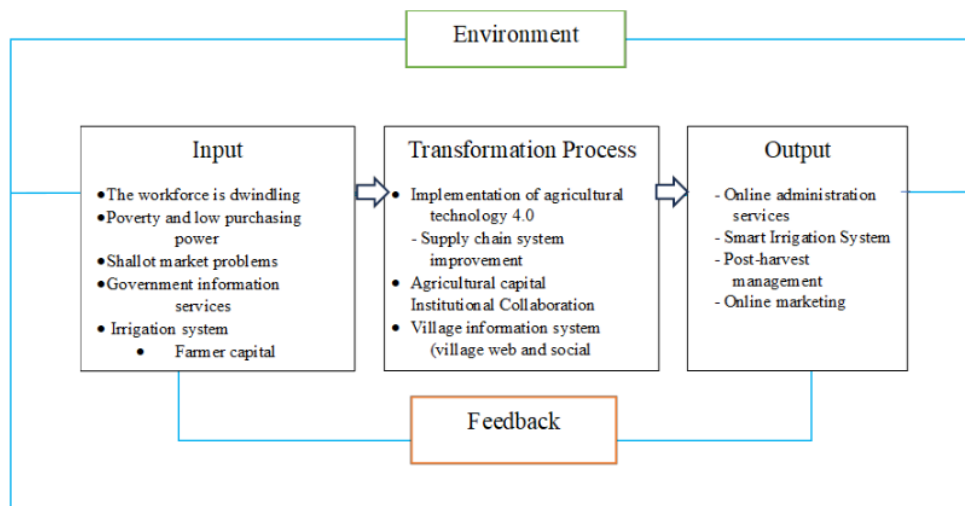


Figure 5: Salu Dewata Village Ecosystem Components and Transformative Process from Conventional Villages to Smart Agriculture-Based Villages (Source: adapted from the Organization Communication Book (Goldhaber, 1993)

Rural digitalization needs to be directed at developing priority programs that emphasize the importance of strategic sector digital transformation for increasing production in rural areas. Digital transformation in rural areas is considered to significantly increase rural agricultural productivity. (Lyos et al., 2020; Bahn et al., 2021; Rolandi et al., 2021) The hope is that in the future, the government can take it breakthrough by encouraging the digitalization process of the agricultural sector based on Agriculture 4.0 technology. (Gautam et al., 2021; Rose & Chilvers, 2018) The state's role in governance and institutional support is very important to facilitate collaboration and participation of various actors. There is a need for a comprehensive local development implementation framework that can support the adoption of digital solutions to support small-scale farmers. (Smidt, 2021) The process of transforming Salu Dewata Village into a smart village can be achieved through digital transformation of the agricultural sector to realize its vision to become a leading shallot horticulture producing village.

The West Java Province digital village development model can be used as an inspiration or model for other villages. The West Java digital transformation model divides four categories of digital villages, namely: Village 1.0 which emphasizes internet infrastructure services; Village 2.0 focuses on digital literacy; Desa 3.0 focuses on digital marketing; and Village 4.0 which focuses on implementing the use of technology to increase village productivity and independence. Several strategic sectors that can become priority programs are generally included in the Smart Village concept, namely technology-based agricultural models that adopt digital technology in the agricultural sector in villages, including the use of sensors, weather monitoring, data analytics, precision agriculture, and mobile applications to help farmers in plant management, fertilization, irrigation, and pest and disease monitoring. (desadigital.jabarprov.go.id, n.d.)

The most important sector in digital village development in Indonesia is agricultural development, because around 82 percent of villages in Indonesia are agricultural-based villages. An agricultural village is a village where almost the entire population depends on the agricultural sector for their livelihood. Smart farming offers a pathway to sustainable farming by providing innovative ways of becoming profitable and socially acceptable farming that benefits the environment, maintains farmers' income and resilience and attracts more youth to the sector. (Inoue, 2020; Musa et al., 2021; Rijswijk et al., 2021) The digital transformation process of rural agriculture can encourage all activities related to the agricultural ecosystem in a broad sense, such as cultivation activities, application of technology, improvement of supply chains, institutions, capital and information systems.

Digital Transformation Through the Application of Agricultural Technology 4.0

In accordance with the development trend of the industrial revolution 4.0, currently digital transformation policies are a smart solution to increase agricultural production. Currently, the application of agriculture 4.0 technology has been proven to increase agricultural production. The core technology of agriculture 4.0 is the use of sensors and robotics, Internet of Things (IoT), cloud computing (Clouds), analytical data in the form of artificial intelligence-machine learning and big data, and decision support systems (DSS). This technology is used as an important instrument in agricultural digitalization activities (Araújo et al., 2021; Chandra & Collis, 2021; Trendov et al., 2019)

Agriculture 4.0 technology can be operated in several forms of intelligent agricultural applications such as: monitoring, control, prediction and logistics in the agricultural sector. (Araújo et al., 2021), both upstream and downstream. Examples include: 1) monitoring applications that can be used to monitor weather, plants, soil, livestock, etc. 2) Control applications, in the form of remote control, of irrigation systems, fertilization, plant diseases and harvesting. 3) Prediction application, such as predicting weather conditions, production, crop and livestock development, and markets. 4) Logistics applications, such as warehousing, transportation and distribution systems, supply chains, and product traceability aspects.

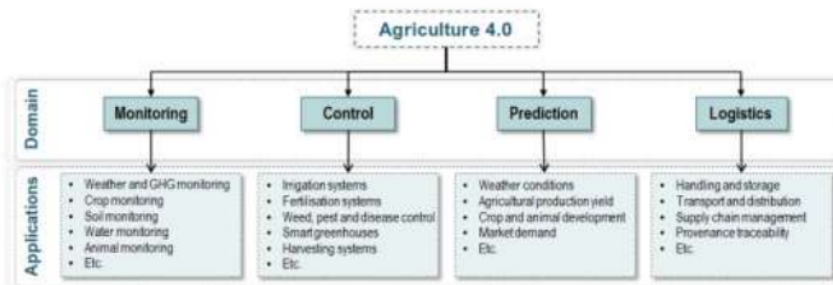


Figure 6: Distribution of Agriculture 4.0 application domains and respective examples of applications (sub-domains)(Araújo et al., 2021)

These applications are important instruments in increasing the production and value chain of agricultural products in rural areas. This digital application can overcome the main problems experienced by farmers in the field, such as climate change problems, low commodity selling prices, farming capital problems, environmental degradation problems, and so on. Through this smart application, a smart agricultural production process will ultimately be created.

The focus of RKDD's work in digital transformation efforts in the agricultural sector can be the development of smart villages in the agricultural sector (smart farming). There are several technologies that have the potential to be developed in Salu Dewata Village, including an IoT-based irrigation system. Smart irrigation systems can help farmers reduce labor, save water, and control watering times remotely. This potential can be done easily, because most farmers already use pipe installations and mechanical pumping systems. This means that the process of becoming smart irrigation only requires one step, namely installing control equipment in the form of sensors and IoT.

Smart Irrigation can be projected as a very strategic program to transform the agricultural sector in this village. Almost all households depend on the shallot farming ecosystem. So if the agricultural system can be digitalized, the impact will be very big. Apart from the economic impact, it can also be resolved, such as the problem of a decreasing workforce, due to the reduction in the young age population because many people go to the city to look for work in the service sector. Another impact is on the environmental sector, with land internalization, farmers do not need to expand their land, which results in forest destruction. So far, there has been a lot of deforestation due to pressure from agricultural and plantation interests.(Upe et al., 2019)

Apart from that, weather and soil sensors can also be applied. Micro weather sensors to help farmers regulate planting seasons, fertilization seasons, and manage plant pests. The working principle of this tool is to use sensors in the form of IoT which can record daily weather conditions, the results are stored in storage in cloud computing, then the data will later become big data, which is ready to be processed to create recommendations for decision support for farmers. Meanwhile, the soil sensor tool can be in the form of a Rapid Soil Check to provide real-time information to farmers regarding the nutrient content of the soil and recommend the amount and type of fertilizer nutrients needed by plants. Fertilization technology using sensors can also be used. Technology that combines watering with fertilization. Technology produces enormous efficiencies. The fertilizer ingredients are mixed in one container, then the tool distributes the fertilizer as needed to the plants.

A supply chain is a coordinated system of organizations, activities, information, and resources involved in the physical or virtual movement of a product or service from producer to consumer. A collection of activities of market players to move goods and services from the beginning of their development until they reach the final consumer; institutional linkages that connect and coordinate producers, processors, traders, and distributors of a product and service. (Perdana, 2020) Rural agriculture produces many commodities, in the form of grain crops, vegetables, fruit, spices and medicines, plantation commodities, and others. Most of these products have not been optimal in increasing income for farmers in rural areas because farmers have not succeeded in creating added value for these commodities. After all, the supply chain system is not supportive.

Many commodities are sold only in raw material form, without prior processing. It is not uncommon for it to just be thrown away because there is a buildup of production that cannot be absorbed by the market, especially horticultural products. This happens because supply chain management is not carried out well, as well as a lack of technological support. Another weakness is that there are still many products that are only consumed domestically, even though if these commodities are processed and exported they will be able to increase the value chain. The problem faced in improving the value chain is the problem of innovation and creativity of village residents. Another problem is the lack of market literacy and production standards. Most village residents do not have experience so they do not understand the needs of urban markets. With the smart village program, the potential for supply chain improvements can be carried out through digital solutions. Through RKDD, communication can be built with stakeholder traders from outside the district, so they can come to buy shallots in the village.

The existing data shows that the old production model that developed in the village has not been able to create a stable and efficient production system. Production tends to fall because it is influenced by high input values. Furthermore, existing production has low economic value, due to the low value chain. Apart from the high production costs of plants, sales results are also reduced because they are sold in raw condition or raw materials. Harvest commodities are not processed first into processed industrial production. Upgrading the value chain can be done in various ways; a) carrying out processing of raw materials or post-harvest processing; b) penetrating strategic markets through good packaging; c) creating its specific market system with special consumers, such as consumers of organic products; d) utilization of market places or smart applications for sales.

In the context of developing the shallot value chain, residents of Salu Dewata Village can be trained to make crafts by making products derived from shallots. Many derivative products from shallots can be made, such as fried shallots, pickled shallots, and cakes as souvenirs. Not only shallot products, but also products such as coffee, cloves, and cocoa can be made from derivative products. This can have an economic impact on improving the value chain, the price of shallots can be increased in value by making this derivative product.

One thing that can be done to improve the value chain of shallot products is the procurement of storage machines, namely Controlled Atmosphere Storage (CAS). This machine can make onions and chilies last up to 6 months. This tool is responsible for slowing down the onion from the rotting process. Shallots and chilies cannot be stored in normal *cool storage*, they must be kept at a temperature of 7 degrees Celsius. In this way, the shallot harvest can be sold gradually without selling it all at once to the market. Because if you sell it all at once, what will happen is that the price will

plummet. Tools like this must be managed by a farmer institution, whether a farmer group, **gapoktan**, Bumdes, or farmer association. It can be rented out to cover operational costs, especially electricity needs.

Development of Agricultural Financing Systems

By accessing agricultural financing, farming households can increase their production and income. However, increasing farmers' accessibility to sources of financing still faces many obstacles. The various types of credit programs issued by the Indonesian Government are still not up to expectations, especially if the reach of program credits is used as a parameter for success. Formal financial institutions, such as banks, cannot yet be relied on as distributors of agricultural financing. Indonesian banking appears to be less supportive of the agricultural sector, where the amount of financing disbursed to the agricultural sector is still very small. (Yoko & Prayoga, 2019)

The development of the debt bondage or loan shark system was caused by many factors, including a lack of capital for farming communities, as well as a chaotic financial management system. Lack of capital is caused by an unprofitable agricultural system, often high inputs are not commensurate with the selling price of the harvest. At harvest time prices are often very low, and farmers have no choice but to sell at that time. The simple post-harvest management system means that shallots do not last long, they must be sold immediately. It's different if farmers or farming groups have a cooler, they might still be able to hold their goods while waiting for prices to rise. But you can't do it yourself because it's quite expensive. Finally, the farmers just gave up.

Another problem is that the farmers' financial system is not very good. Farmers generally do not have savings. So most farmers borrow from moneylenders or middlemen. If the moneylender is also a trader, then the harvest must usually be sold to the trader. If moneylenders don't buy the harvest, it's usually at high-interest rates. Loan sharks usually do not have to provide loans in the form of money, but can also be in the form of production inputs, such as fertilizer, pesticides, or agricultural machinery. Fertilizers and pesticides are items that are an absolute must for farmers, so if they don't have capital, they have to borrow from moneylenders.

In fact, with the smart village program, through RKDD we can find a way together to find cheap sources of financing. Among them, you can search through financial technology. It can also be done through a crowdfunding system, known as Peer to Peer landing. Several financing institutions have prepared systems like this, such as Tani Hub, I-Grow, Vegetable Box, etc.

Institutional Support and Collaboration

In Indonesia since 2015, online aggregators have begun to emerge in the agricultural sector, namely intermediaries who use internet-based applications or websites that act as liaison between farmers and markets, suppliers and funders. This online aggregator also acts as a driver for partner farmers towards agriculture 4.0. (Meliala et al., 2019) The presence of RKDD can consolidate the existing digital ecosystem in the village, and can become a bridge to connect to ecosystems outside the village such as these aggregators. In accordance with the main potential of Salu Dewata Village, RKDD management in the institutional sector can prioritize agricultural sector institutions to increase productivity, marketing and capital.

Through community spaces, farmer groups, GAPOKTAN and cooperatives can be empowered. Farmer institutions can contribute to overcoming various problems (Wardhiani et al., 2023.; Tafakresnanto & Latifah, 2022) The strategies that need to be implemented in strengthening local agribusiness institutions are continuous improvement of institutional human resources and involvement of young farmers in the institutional management structure of agribusiness, digital-based institutional management training, increased collaboration with financial institutions and maximum utilization of government support, maximizing (Syarif & Ikmal Saleh, 2022) An effective way to achieve sustainable goals is training followed by field demonstrations and comparative studies with other, more advanced farmer groups. (Oktarina et al., 2020)

RKDD can bring together voluntary sector and private sector organizations. (Uphoff, 1986), Private sector involvement can be involved as business partners of organizations such as farmer associations

or farmer groups. Private sectors such as cooperatives, technology companies, financial institutions are businesses that can partner with farmers. Cooperative business activities in Indonesia are increasing, especially in the field of agricultural cooperatives. (Dai et al., 2019) Smart village institutional arrangements can be made through RKDD. Where all village institutional ecosystems can gather in it, farmers' institutions, craftsmen's institutions or creative businesses, women's organizations, etc. can all be included in the RKDD. Farmer organizations can actually be farmer groups, which are gathered based on the commodities they cultivate. The aim is so that the problems they face can be more focused on being resolved. This organization can take care of cultivation, marketing, and providing production facilities.

To realize this development model, of course it must be realized in synergy with all parties, especially in the form of support and collaboration with Penta Helix, which consists of government elements, related Regional Apparatus Organizations (OPD), society (communities), private parties, universities and the media. This partnership is built according to existing main tasks and functions by eliminating sectoral egos between each sector. Apart from that, political will and strong leadership character are needed at the village level to jointly mobilize the community and develop existing potential through innovative policies. (Setya Yunas, 2019)

Through penta helix synergy, the food security sector can be strengthened. (Putra et al., 2021) This can be seen in various implementations of development policies in rural areas, involving the Ministry of Communication and Information, the Ministry of PDTT Villages, the Ministry of Agriculture, and others. The Ministry of Communication and Information also carries out various strategies and programs, for example the village internet program. The Ministry of Communication and Information is also involved in implementing accelerated digitalization of strategic sectors, which include the agricultural, logistics, education, health, tourism, finance and creative economy sectors. Together with agricultural application developers, the Ministry of Communication and Information developed the Go Online Farmers Program to encourage the use of technology to improve the welfare of Indonesian farmers. Through this program, farmers are facilitated with the national agricultural marketplace application, Online Agricultural Extension, and Stock Control Information. Online-based extension, with this application will support extension workers and serve farmers 24 hours a day. (kominfo.go.id, 2018)

Likewise, the Ministry of Agriculture also has various programs in rural areas regarding agriculture, including agricultural digitalization, the Horticultural Village Program, and others. The PDTT Village Ministry has created a Smart Village program, a more massive program. Likewise, the private sector also contributes to rural digital transformation. Such as BUMN, PT Telkom, etc. Local governments also carry out many rural digital programs. The World Food and Agriculture Organization (FAO) together with the Bogor Agricultural Institute (IPB), conducted a survey in 132 villages in Indonesia to assess the level of digital innovation, which shows that West Java is implementing quite progressive digital agricultural innovation in its villages. Several villages in West Java are considered to be implementing digital innovation technology in various activities such as *smart farming*, *smart fishery*, *smart livestock*, and many more.

Several universities also provide support through Thematic KKN. Universities can include areas included in the digital village designation as locations for Thematic Real Work Lectures (Thematic KKN). These villages can be included in two categories, such as digital villages, agricultural villages, creative economy villages, and so on. Such efforts can be collaborated in the form of an MOU between Regional Governments, based on proposals from villages, or digital village initiatives. The activity program focuses on solving problems in certain areas based on community problems and the direction of government development policies in certain districts/cities. The elements involved are students, Field Supervisors (DPL) and the community. Implemented within a certain time by prioritizing academic and community needs.

Rural Information System (Village Website and Social Media Accounts)

Currently, Salu Dewata Village already has its own village website. This website was created by a third party, using village funds. The website contains the Village Vision and Mission, Village Government Structure, and BPD Structure. Since the soft launch, there have been 2,300 people who

have opened the website (26/05/2023). This website also contains the IDM Score village status, as well as various IDM indicators with their achievements. One of the interesting features of this website is the shopping feature. Some of the local products offered by the website include: shallots, candlenuts, telon oil, lemongrass oil, various types of fertilizer, walnut cake, baje (diamonds), Danke and Danke Chips, etc. This website is currently in the testing phase, before the grand launching, it is planned to carry out training for digital cadres, community members who join the digital community space, as well as conducting outreach to village communities.

By managing rural information, both through village websites and social media accounts, villages can overcome the problem of barriers to citizens' access to information from the village government to citizens. So far, residents have wanted to know information about government services, such as village programs, reports on the use of village funds, information on government assistance and so on. If until now it was conveyed through meeting media such as Friday prayers, mobile announcements, or through the authorities, now the community already knows about it through the village website platform. With the online shopping feature on the website, residents can access village-produced goods, such as fried onions, beans and ground coffee, etc. The village website can also be a communication bridge for residents to promote goods outside the village, whereas economic actors from outside the village can access goods in the village.

This information system is supported by village social media accounts, which are created by digital cadres, so information can be accessed more widely by all social media users. The products produced by the village can be shared via social media accounts, such as Facebook and Instagram. It is possible to promote village products through social media platforms. Online sales in villages can actually be done independently via social media such as Facebook and IG, but so far this has not been optimal. Like selling coffee beans and ground coffee, there are already farmers who do it, and are in great demand at the moment. However, through the Village Digital Community Space (RKDD), this can be further encouraged and further developed, so that communities can collaborate in order to achieve profitable economic scales.

The presence of the Salu Dewata village website is currently running, the obstacle faced is that it is not yet running completely because resources are limited. What is needed is training for village digital cadres. Then after that, the community also needs to be trained to make sales via the village website. Not only that, people also need to be trained to make products and how to create content, so they can promote themselves through the village website. But at least with the presence of the village website, the government and village residents already have experience in managing it, know the benefits, including the problems, for further development.

Sustainability of the Smart Village Program

In order to maintain the sustainability of the smart village program, feedback is needed. In systems theory, feedback is a very important mechanism in running a smart village program. Feedback allows a program to receive information about the program's impact, efficiency, and success from its external environment (community, users, other stakeholders) and use that information to manage and improve program performance.(Moore, 1993).

Feedback collection involves receiving information from various sources, such as surveys, interviews, comments from smart application users, focus groups, and evaluations by external parties. This feedback can include evaluations of service quality, community satisfaction, problems encountered, or user impressions of the smart application. Once the feedback is collected, the next step is to analyze it. This analysis includes understanding the challenges and opportunities identified by the feedback, as well as understanding the impact and results achieved by the program.

Feedback helps in assessing the performance of smart village programs in an objective manner. This assessment includes evaluating the suitability of the program with the initial goals and vision, measuring efficiency, sustainability and the resulting positive impact. By using feedback, the smart village program can make necessary improvements and developments. This may include smart application enhancements, service improvements, or strategy adjustments to achieve established goals. The smart village program environment may change over time, and feedback helps in adapting

to those changes. The program must be able to respond to changing needs and conditions in the village quickly and precisely. Feedback that has been analyzed must also be communicated to related parties, including external parties and other stakeholders. Transparent and open reporting helps in building trust and gaining support for smart village programs.

4. Conclusion

Since the introduction of internet infrastructure into the village, in general, the condition of the digital ecosystem in Salu Dewata village has developed quite well. However, the functions of the internet for strategic economic development such as digitalization of the agricultural sector, the function of the internet is still limited to use for personal communication, while its use for strategic activities such as agriculture is still lacking. It is designated as a Smart Village participant in the Ministry of Village Development for Disadvantaged Regions and Transmigration, Salu Dewata Village has formed RKDD (Village Digital Community Space). The institution is working on a village website service that contains general village information and community economic opportunities. Meanwhile, the implementation of digital transformation in the agricultural sector is being considered, because the prospects for developing smart villages based on agriculture are very large. This village is a center for shallot plantations but experiences many obstacles, such as climate change, labor shortages, post-harvest, and low income due to these problems.

This research is limited to one village with agricultural-based natural resources with the horticultural commodity of shallots. The research focuses more on how to see the prospects of a village being designated as a smart village by the government. We are specifically looking at digital transformation planning to become a smart village in the future. This village cannot yet be used as an example of success, but merely looks at the prospects for implementing agricultural digitalization. To be more comprehensive, in the future, it may be necessary to conduct research that looks at villages that have succeeded in becoming smart villages and implementing digital transformation in the agricultural sector.

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