

Digital Farming and Smart Farming from the Perspective of Agricultural Students at Malikussaleh University 2022

Kamaruddin Hasan¹, Masriadi¹, Muchlis¹ Asmaul Husna¹

¹*Department of Communication Studies, Faculty of Social and Political Sciences,
Universitas Malikussaleh*

*Corresponding author, email: kamaruddin@unimal.ac.id

ABSTRACT

This study describes the views of agricultural students in seeing the opportunities and challenges of the era of digital farming and smart farming. To further grow their interest to be ready to become agricultural entrepreneurs who are creative, innovative, professional, competitive and able to absorb agricultural sector jobs. According to the Central Bureau of Statistics (BPS) national labor force survey, 20.62% of Indonesian youth work in the agricultural sector in August 2020, an increase compared to the previous period in 2019 which amounted to 18.43%, and will continue to increase until 2022. An increase in the number of young people in the sector agriculture can be a momentum to expand it. As many as 85.62% of them are internet users and have the opportunity to become early adopters of digital technology in the agricultural sector. So far, farmers' understanding of digital farming and smart farming is low because the majority of farmers have graduated from elementary and secondary schools. The average age is over 45 years, which makes it difficult to adapt to digital technology. Helplessness when dealing with digital media technology.

The increasing number of young people interested in the agricultural sector is a hope as well as an opportunity to increase the development of a digital-based agricultural world. Of course this can be integrated into agricultural extension programs by millennials provided that agricultural students and alumni have adequate digital skills. That currently modernization of agriculture is a necessity. The agricultural sector continues to move towards digital farming and smart farming. Digitization of Agriculture facilitates monitoring, marketing, technology and helps accelerate the production process. Implementation of intelligent and critical use of digital media. The final results of this study are descriptive views and strategies of agricultural students regarding the phenomenon of digital farming and smart farming.

Primary and secondary data were obtained through observation, interviews, Focus Group Discussion and literature review. Theoretical basis, concepts and models as well as scientific contributions are used by Digital Skills or Digital Literacy, Digital Farming, Smart Farming 4.0 and Agricultural Students. The research informants consisted of agricultural students and alumni, digital skills experts, agricultural academics and relevant stakeholders. Data analysis used snow ball informants and cross checks, synchronization, compression, reduction, data display and conclusion. The results of the study show that Malikussaleh University agricultural students and alumni as millennials are active internet users with various media that have the opportunity to become early adopters of digital technology in the agricultural sector towards Digital Farming and smart farming. Digitizing agriculture with the active involvement of millennials will facilitate monitoring, marketing, technology and help accelerate the production process by implementing the use of digital media intelligently and critically. The stigma of agriculture only for those with low education seems to still exist. Need to increase understanding of digital farming and smart farming among Millennials. Maximum implementation of digital farming and smart farming is a big hope in the hope of being able to realize a sustainable agricultural system.

Keywords: *digital farming, smart farming, Perspective agricultural students*

I. PRELIMINARY

Advances in information and communication technology, increasingly have many choices of media to produce and distribute information. The presence of internet digital media as a new medium with all its forms and functions has even changed the established communication model, namely mass communication into interactive communication.

The internet builds connectivity from various directions and creates an abundance of information. The internet has become one of the most fertile and cheap channels for spreading information. In addition to characterizing

anonymity, the internet also provides cheap and instant distribution and can be accessed and posted in various places.

The internet era has penetrated all lines of human life. The world of agriculture is no exception. Optimizing agricultural technology by utilizing digitalization is now a necessity. Digital literacy is needed for agricultural activists, it is important in improving the welfare of society, especially farmers.

Utilization and literacy of media, especially digital media including social media in the world of agriculture is important for strengthening digital farming and smart farming. Digital media appears to offer a fertile field of overflowing information. Its users are pampered with the convenience of receiving and sending information, without the barriers of space and time. Enjoy the main service as a *very important person*, enjoy the flow of information flowing from various unexpected directions.

Iswandi Syahputra, in his research entitled *Virtual Democracy and Cyber War on Social Media from the Perspective of Indonesian Netizens*, cites the opinion of Weeks and Holbert (2013), that every social media activity or user acts as a message distributor. Social media has appeared to change dramatically the structure of communication that has been established so far, namely mass communication shifting to an era of internet-based interactive communication (Khang, Ki and Ye, 2012). The communication media has formed a giant interaction network so that the world seems to have turned into a global village. Digital media makes everyone an opinion leader, not only consumers, but also producers and distributors of information.

In Indonesia, the number of social media users exceeds 130 million out of a population of 265.4 million (We Are Social survey in collaboration with Hootsuite). Meanwhile, there are more than 143 million internet users (APJII survey, 2017). This means that almost all internet users are also social media users, who are dominated by the ages of 19 to 34 years (49.52 percent).

According to the National Labor Force Survey conducted by the Central Bureau of Statistics (BPS), 20.62% of Indonesian youth worked in the agricultural sector in August 2020, an increase compared to the previous period which amounted to 18.43%. The increase in the number of young people in the agricultural sector during this pandemic can be a momentum to expand it. As many as 85.62% of them are internet users and have the opportunity to become *early adopters* of digital technology in the agricultural sector.

FAO predicts that by 2050 the world's population will increase to 9.6 billion. This means that agricultural production must increase by 70% in order to be able to meet the needs of a population of that size (Budiharto 2019). If it is not fulfilled, the world will be threatened with a food crisis. Another issue that is also important is the difficulty of regeneration. Research from the Agro-Economy Research Forum, 2020 states that the workforce in agriculture leads to the *aging farmer* where most farmers consist of the old age group.

The increasing number of old farmers and the lack of interest of young people of productive age to engage in agriculture are thought to be due, among other things, to the assumption that non-agricultural income is greater than that of the agricultural sector. Negative perceptions about agriculture are often described as dirty and hard work because they often interact with mud and have to dig. Agricultural sector jobs do not require higher education requirements, while non-agricultural sectors demand higher education and have clearer career paths. The higher the level of education, the younger the tendency to have a career outside of agriculture. Contains high risks such as crop failure due to natural disasters, price fluctuations and other uncertainties (Arvianti et al. 2019).

The Ministry of Agriculture, 2021, reported that farmers' digital literacy is low, the majority of farmers are elementary school graduates with an average age of more than 45 years. This situation makes it difficult for farmers to adapt to new technologies. However, the increase in the number of millennials in the agricultural sector is a hope for increasing digital literacy among farmers. Of course this can be integrated into agricultural extension programs by millennials provided that millennials have adequate digital skills.

The agricultural sector is still the leading sector in improving people's welfare in a sustainable manner. Agriculture plays a crucial role in advancing the economy. The question that arises is how to optimize the agricultural technology that is being developed. The existence of agricultural technology is expected to be able to increase the quality of agriculture, as well as make it easier for managers of the agricultural sector.

The application of agricultural technology in Aceh, for example, is still not optimal and there must be adjustments, it is still necessary to consider several factors such as natural conditions, experts operating the tools, people's

knowledge of agricultural technology tools and the use of digitalization. Of course, in this case, the role of millennials is urgent.

Entering the post-pandemic era, of course, there will be challenges in rebuilding the economy which was stagnant during the pandemic. For this reason, it is hoped that programs to revive through millennial contributions within the independent campus can provide a new understanding of the importance of the agricultural sector. The form of this program will be more optimal if it is accompanied by consistent use of technology, given the increasingly massive digitalization era.

1.1. Purpose and Objectives of the Research

The purposes and objectives of the research were conducted to; describes digital understanding and smart farming from a millennial perspective, especially agricultural students and alumni of Malikussaleh University.

1.2. Formulation of the Problem

Based on the background above, it is important to conduct research on how to understand digital and smart farming from a millennial perspective, especially agricultural students and alumni of Malikussaleh University.

2. RESEARCH METHOD

The method used in this research is descriptive qualitative. Extracting information from informants was carried out in depth with the perspective of representing the selected groups. In *assessment*, individual and institutional informants must be considered as active subjects who can develop information based on the questions raised.

The informants were selected based on a purposive technique, with the criteria that the informants were millennials, in this case agricultural students, agricultural alumni, academics and practitioners or entrepreneurs in agriculture. So that the credibility and competency factors of informants are important considerations in making choices. While the object of research is the view and understanding of digital farming, smart farming.

The qualitative paradigm is more emphasized on the issue of depth or quality of data, and not the amount or quantity of data. Qualitative research is an approach to conducting research that is oriented towards natural symptoms or phenomena.

Data Collection Techniques, namely; initial assessment, *observation*, *interviews*, *Focus Group Discussions*, and *document or literature studies*. Whereas Data Analysis and Writing Techniques, namely; *snowball informants* and *cross checks*, synchronization, Condensation (*Process of Concise and Abbreviating*) and reduction, presentation and conclusion.

While the basis of the library research process rests on scientific principles; the concept of digital farming, smart farming, digital and millennial skills

3. RESULTS AND DISCUSSION

3.1 Digital Farming and Smart Farming from a Millennial Perspective

The agricultural sector continues to move towards digital farming and smart farming. Agricultural digitalization can facilitate monitoring, marketing, technology and help accelerate the production process. The digitalization of agriculture has entered the 4.0 revolution era. Smart farming has great potential to increase farmers' income and contribute to agricultural sustainability.

Digital and smart farming can improve accuracy in providing crop inputs and agricultural land. The agricultural revolution consisting of the internet of things, artificial intelligence, human machine interface, robotic and sensor technology and 3D printing technology has encouraged the development of agricultural innovation after the increasing use of information and communication technology in agriculture.

Modernization of agriculture is inevitable. Where in the agricultural sector it continues to move towards digital farming and smart farming. Digitization of Agriculture facilitates monitoring, marketing, technology and helps accelerate the production process.

Digital technology in agriculture can be defined as the application of information and communication technology through devices, networks, services and applications in the agricultural sector. The purpose of its use is to assist agricultural sector actors in making decisions and utilizing resources.

The rapid development of communication technology requires farmers to be able to utilize social media in disseminating agricultural information. How do farmers use digital media, in analyzing factors related to the level of media utilization by analyzing agricultural information processing and its relationship with the use of digital media.

The development of the digital-based agricultural sector can support food security, which is a basic need for human life. Digital agriculture can provide advantages in the agricultural process in terms of availability, access and consumption.

The adoption of technology in agriculture is expected to increase the competitiveness of agriculture in the global market. This adoption must be accompanied by strengthening digital literacy skills. In particular, not all farmers have access to digital technology. So this adoption will be a challenge in itself even though it can be beneficial for farmers.

Jafaruddin, (35) alumni of the Faculty of Agriculture at Malikussaleh University, currently works in the media sector as head of the Serambi Indonesia bureau in Lhokseumawe City, strengthening this assumption.

“...As an agriculture alumni, of course I really hope that the process of adopting and adapting digital technology in agriculture must continue to be encouraged by all competent elements. So as to increase the competitiveness of agriculture in local, national and even global markets. However, the main requirement that must be met is the ability to adopt digital skills for students, alumni and of course millennial farmers. [1]

According to him, in addition to increasing agricultural competitiveness in local, national and even global markets, the adoption of digital technology can reduce middlemen or bench token who sometimes make it difficult for farmers, because they have bargaining power in determining producer prices. In addition, with this technology, farmers can obtain accurate and transparent market commodity price information. In developing digital technology, it is also necessary to educate digital literacy and equal access so that farmers are able to understand before using this technology. [2].

The World Bank report, 2020, released by the Ministry of Agriculture explains that in the digital era, modern agricultural systems can be known as agriculture 4.0 where the agricultural systems here apply the Internet of Things (IoT) to support their development process. Agriculture 4.0 is a modern and precise farming system where all systems are combined with digital information technology.

The maximum understanding and application of digital farming and smart farming is a great hope for agricultural students. In a focus group discussion (FGD) on 16 October 2022 at the City Cafe Country Cafe, Lhokseumawe City. Agriculture in the digital era does not only work conventionally by going directly to agricultural land but is broader than that. Various processes in the agricultural system will take advantage of the application of technology.

The Covid-19 pandemic period also accelerated the digitalization of agriculture, especially in the field of marketing. Limitations in the distribution of agricultural products gave rise to various new shortcuts so that farmers can survive. This condition gave birth to optimizing the use of the internet and online systems as a medium of communication between farmers and also the marketing process. Farmers can easily communicate and carry out fast and secure transactions with consumers through internet technology.

In the focus group discussion (FGD) it was also described that the understanding and application of digital farming and smart farming will help farmers to run a more measurable farming system. The smart farming system can more easily find out the needs of plants in order to achieve optimal production. Farmers can control soil moisture, temperature, pH, and wind speed using only smartphone-based technology or other digital farming tools. Even now there are many land monitoring systems using drones for land mapping. The irrigation system in smart farming also facilitates agricultural activities because it can be set automatically when watering along with the flow of water to be flowed. All measurable agricultural systems using this technology are more effective and efficient because everything is recorded in the application used.

Academics of the Faculty of Agriculture, Malikussaleh University, in a focus group discussion, also revealed that the steps that must be prepared by the farming community in facing the industrial revolution 4.0 include farmers, government, the general public, the business world mutually supporting the availability of affordable and equitable

infrastructure, availability signals, including extension agents, already have Android with software that supports the extension services, which must be transferred to farmers. Including the institution, BPP has supported it there, can reach signals, electricity.

FGD participants agreed that how to optimize the role of students, academics, synergize with the government, the business world and stakeholders in assisting farmers to take advantage of agricultural business opportunities in the digital era. Teruamata in wider marketing potential. Ahmad Fiki, an agricultural student from Batch 2018 revealed.

...during the rapid advancement of technology, we students and farmers are not only able to cultivate rice, vegetables, fruit, or other commodities. We can also promote the harvest more broadly through digital marketing strategies. For this reason, it is necessary to prepare a website or social media to reach the audience. Apart from that, you have to be able to put your products on the marketplace so that customers can eat them right away.”

Apart from marketing, they also produce attractive products, being a businessman in the agricultural sector also opens up opportunities for millennials to present interesting products that were rarely known before, for example, like the cultivation of plants that will later be made as herbal medicine. There are various types of plant parts that can be used, ranging from bark, leaves, rhizomes, and fruit.

Flexible farming, farming can not only be done by people who have large tracts of land in mountainous areas, those who live in urban areas can also start cultivating various vegetables and fruits from home. There are many urban farming technologies that are becoming increasingly popular, one of which is farming with hydroponic technology.

In addition, contributing to the need for food, in line with the increase in population, of course the agricultural sector plays an important role in ensuring that food needs are always fulfilled. This effort can be started from oneself, namely by presenting various types of food from agricultural land. It's no wonder that the agricultural business is also one of the right recommendations for those who want to run a sustainable business. Efforts to protect the environment, when running an agricultural business using sustainable business principles, can reduce pollution and other adverse effects that can harm the environment.

3.2 Digital Proficiency; Main Terms of Digital Farming and Smart Farming

Digitalization has changed lifestyles starting from form, space and time, almost all depending on the internet or digitalization. Digitalization opens up great opportunities to become human beings who are increasingly adept and understand in using digital technology. So digital skills are absolutely necessary. Digital proficiency is an individual's ability to know, understand and use digital operating system hardware and software.

Digital skills are the knowledge and skills of users in utilizing digital media, such as communication tools, internet networks and so on. User proficiency in digital literacy includes the ability to find, work on, evaluate, use, create and utilize it wisely, intelligently, carefully and precisely according to its use.

Skills have traditionally been interpreted as the ability to use language to read, write, listen and speak. In the following context, literacy refers to the ability to read and write at an adequate level to communicate in a literate society. According to UNESCO, literacy is the ability to recognize, understand, predict, create, communicate, calculate, and change printed and written materials in various contexts.

Literacy involves a continuum line of learning that enables an individual to achieve his goal of building his knowledge and potential and participating in community development. In addition, according to the Education Center in general, literacy is an individual's ability to use all the potential skills he has in his life. Furthermore, the latest meaning of literacy is critical thinking, being able to calculate, solving problems, how to achieve goals, developing one's knowledge and potential.

Living in a digitalized world, must involve digital technology and devices, so that digital skills become urgent, otherwise you will be stuttered into a digitalized world. It cannot be denied, the development of the digital world has spread to all sides of life. Currently, it seems that almost no side of human life is not affected by the digitalization process, including in the agricultural realm.

This will be a new hope for future agricultural development as well as a challenge in efforts to increase agricultural competitiveness in national and global markets. Indeed, nationally, in terms of human resources, Indonesia will

face a demographic bonus as an opportunity for the regeneration of agricultural human resources, which are the millennial generation, including students.

At present the main problems faced by agriculture including Aceh, one of which is human resources which are still low, technology is still conventional, value added products are still low because the main export is still in the form of raw materials and the contribution of innovation to economic growth is still small. Acceleration of technological transformation and innovation is needed as well as preparing and encouraging the young millennial generation of students, especially agricultural students, to develop smart agriculture or *smart farming*.

In this regard, an agricultural student majoring in Agribusiness at Malikussaleh University Muhammad Alfaris Class of 2018.

“...indeed, currently human resources related to understanding digitalization are still lacking in Aceh and even Indonesia in general. Coupled with the lack of young people who want to work in the agricultural profession, of course this can lead to threats to our food availability in the next decade. The technology that existed in the 4.0 era should be a big opportunity, the challenge I think is how in this digital era to increase the interest of young people, especially us students, to pursue the agricultural profession with fast access to information and communication that young people can use to open up business opportunities in agriculture. .”[4]

For agricultural students, of course, there is great hope that in the current digital era, the world of agriculture must really take advantage of opportunities, of course for all the main groups of the government in providing various facilities and infrastructure towards *smart farming*.

Rian Arianto, a Batch 2018 student majoring in Aquaculture, Faculty of Agriculture, Malikussaleh University, also explained.

“...the key is attention and support from the government, especially for research and technology development funds. We can imagine that if Aceh and Indonesia become one of the key players in agricultural research including cultivation, of course this will have a positive impact on increasing agricultural production and treatment. Country’s foreign exchange and increasing employment rates.”

For Ismail, a student majoring in Agribusiness Class of 2017, he admitted that he understood how important digital skills were for agricultural students in the development of the world of agriculture which is being worked on in theory and practice. For Ismail this was strengthened by several supporting courses on agricultural digitalization, including management and Agro-industrial Technology courses, agricultural product technology, agricultural communications and Resource and Environmental economics.

“...I see that the use of digital technology can certainly maximize agricultural output, which has so far been relatively low. With IoT-based digital technology, farmers can find out their nutrient needs and weather conditions through sensors that are integrated with applications on smartphones. One of the issues that has surfaced in the production process is the productivity of agricultural products which is relatively low compared to other countries. This is mainly due to 90 percent of farmers still using conventional methods.. [6]”

Malikussaleh University agricultural students also admit that many subjects are very relevant to technology and agricultural digitization, for example courses such as resource and environmental economics, that technology is very play an active and significant role in agriculture and the environment. Using technology can have a significant impact on agriculture, such as accelerating production and increasing efficiency.

It can be seen that the Aceh area of rice farming communities uses rice harvesting machines with the benefit of reducing harvest operational costs and accelerating harvests, so as to be able to obtain maximum profits. In addition, by using a *smartphone*, farmers can interact to sell crops and purchase agricultural production tools more effectively and efficiently. However, the lack of farmers' knowledge of the use of technology makes it difficult for many farmers to carry out agricultural production.

It is hoped that many young people who want to contribute to the agricultural profession with their technological knowledge will be able to have many positive impacts on agriculture in the future. With knowledge about agriculture and the environmental impacts caused by agricultural factory production such as waste and air pollution, students are expected to be able to provide solutions using technology and digital utilization. As the younger generation, we still have to consider how important the agricultural sector is in the future.

In line with Triyono's research results, the author quoted from the UMY campus repository website that techno agropreneurs. Namely farmers who have the ability to develop added value of agricultural products that have competitive advantages in national and global markets as well as *job creators*, job creators for agricultural development with a broad agribusiness perspective. Including, improvement and capacity building of infrastructure including telecommunications and agricultural institutions need to be prioritized to increase the efficiency and competitiveness of agricultural products.

Digital technology in agriculture can be defined as the application of information and communication technology through devices, networks, services and applications in the agricultural sector. The purpose of its use is to assist agricultural sector actors in making decisions and utilizing resources (World Bank, 2020). According to reports by MercyCorps and Rabobank, there are 55 digital agricultural technologies in Indonesia. The report also states that 60% of digital agricultural technology targets digital information such as market or price information. Another 40% focus on market access and nearly a third target supply chain and data management areas, while the rest focus on financial services in agriculture and agricultural mechanization.

The agricultural sector is one of the sectors that contributes greatly to the national Gross Domestic Product. Unfortunately, in recent years this income has decreased due to agricultural productivity which is considered sluggish due to various factors. One of them is the lack of interest of successors in agriculture. As reported from the ITB website, the majority of farmers in Indonesia are over 45 years old where young people are no longer interested in being farmers.

In the Focus Group Discussion (FGD) on 16 October 2022, millennials, agricultural students are ready to become field instructors in terms of agricultural digitization. In general, it is understood that digital skills are the knowledge and skills of users in utilizing digital media, such as communication tools, internet networks and so on. While the user's skills in digital literacy include the ability to find, work on, evaluate, use, create and utilize it wisely, smartly, carefully and precisely according to its use.

Muktamar (47) from the Lhokseumawe City government, acknowledged that the benefits of digital skills and digital literacy can increase human resources in all fields including agriculture.

"... it is indeed a necessity nowadays to master IT, including digital skills that can increase regional human resources including considerations in making development policies ..." [7]

Increase knowledge by reading various kinds of useful information for farmers. Increase one's understanding of an extension material. Makes someone think critically. Strengthening the personality value of the farming community. In the business world, as conveyed by Azhari (45), stated;

"...that digital skills for the business world can accelerate business and business development. Considerations in determining business development steps and increasing business efficiency." [8]

Challenges in farmers' digital skills for agricultural development, especially in the field of agricultural extension. Characteristics of farmers who are still strong in holding culture require a slower process in accepting innovation. This is still a challenge for agricultural extension workers in delivering new technologies.

The results of Soekartawi's research (1988) state that small farmers are generally risk averse, they are the ones who will bear the risk of what happens by implementing an innovation. After they are sure of the results that will be obtained if the technology is adopted, then the next step is the application of technology. The education level of elderly farmers is currently relatively low, and most of them are still active in their farming business. Narrow land ownership is a determining factor in consideration for dealing with risks. The high number of smallholders is a challenge that must be considered in disseminating a new technology.

3.3. Attracting Millennial Interest in the Agricultural Sector

Researcher at the Center for Indonesian Policy Studies (CIPS), Indra Setiawan, said that the digitization of the agricultural sector needs to be accelerated in order to attract the interest of the younger generation to agricultural development. Admittedly, during the pandemic, people's interest in agriculture has increased. Planting activities

at home as time fillers are increasingly being carried out by urban communities. Even the number of young people who are interested in discussing and carrying out existing practices in the agricultural sector has also increased. If this interest is supported by the sophistication of digital technology, the agricultural sector can come back to life and develop. Moreover, the Central Statistics Agency has stated that there was an increase in the number of workers in the agricultural sector by 2.78 million from August 2019 to August 2020.

Slightly different from Indra Setiawan's opinion, for Abdurrahman, a statistician at BPS South Kalimantan Province in an online media, stated that the agricultural sector in Indonesia does not seem very attractive as a work area for millennials. This is reflected in their low participation in this sector. The results of the Inter-Census Agricultural Survey conducted by the Central Statistics Agency (BPS) in 2018 recorded only around 4.1 million people aged 25-34 years out of a total of 33.4 million farmers.

The latest BPS data from the 2021 National Labor Force Survey (Sakernas), even mentions that Indonesian farmers are dominated by elderly people. They occupy nearly half of it. The younger generation who enter the agricultural sector is not comparable to the old farmers who retire and leave the world of agriculture. As a result, not only is the average age of farmers getting older, but the number of farmers also continues to decline. This condition shows that agriculture is starting to lose interest.

Over time, millennials or people of productive age have begun to shift to the non-agricultural sector, particularly to the manufacturing and trade industry sectors. Thirty years ago, more than half of the total employed were engaged in the agricultural sector. Shifts like this often occur in many countries that are starting to develop. The level of productivity and wage rates in the industrial sector which is greater than agriculture seems to be quite a logical reason.

Even though there has been a shift, until now agriculture is still the foundation for people to make a living. Data from BPS Sakernas, in 2021 it was recorded that around 28.33 percent of Indonesia's population aged 15 years and over worked in this business field. This number is equivalent to 37.13 million workers. This figure is still relatively large. The Indonesian economy is also still driven by the agricultural sector. Its share reaches 13.28 percent in Indonesia's Gross Domestic Product during 2021. The second highest after the manufacturing sector. Therefore, Indonesia cannot be separated from agriculture. Development in the sector continues.

According to Abdul Rahman, there are several important notes related to agricultural development especially in the era of disruption, digital and pandemic as it is today. *First*, farmer education continues to be encouraged so that it can increase and be able to accelerate. The agricultural situation in Indonesia is still faced with the relatively low level of education of farmers. Most of our farmers still have elementary school education and below. Until 2021, their number will reach 64.28 percent. The stigma of agriculture only for those with low education seems to still exist. Those with relatively high education do not look at the agricultural sector as a job destination. Including even those who graduated from the department of agriculture. Therefore, efforts are needed to encourage the interest of the millennial generation, including those with higher education, to build an agricultural sector that is appropriate to the era. Maybe it's no longer conventional agriculture, but agriculture that is literate with digital technology.

Second, related to the point of digital-based agriculture, the need to build a healthy and conducive modern agricultural climate. The modern agricultural climate can shape itself when there is a vibrant millennial farming community. But on the other hand, the government as the holder of the regulator also needs to make efforts to encourage a healthy and conducive modern business climate. Currently, the digital climate is more dominated by industrial processed products. Meanwhile, agricultural products do not yet have a market share as wide as industrial products. Agriculture is still comfortable to operate conventionally. In the future, ideally, this modern agricultural climate will be driven by millennials who are digitally literate.

Opinion Abdurrahman Andini Noviani, an agricultural student at Malikussaleh University Class of 2018. The cause of many young people who are not interested in pursuing the agricultural profession is low income. One of the factors is the low level of selling prices for agricultural products and coupled with the quality of agricultural products which only meet the local market so that farmers' income tends to be low. So this is where the role of technology is needed to be able to overcome this problem.

“...technology can be utilized effectively and efficiently if the role of education, government and society can work together well, starting to generate human resources in the agricultural sector in the regions by conducting counselling and technology training organized by the government. I have participated in regional seminars at Samudra Langsa University in the POPMASEPI (Indonesian all Indonesian agriculture student professional

organization association) where we discussed local commodities and how to take advantage of the digital era, so that the government can control and develop the potential of local agricultural commodities. For example, with mangrove commodities, we can develop them with technology and communication, we can develop mangrove tourism in the Langsa area, batik clothes using dyes from mangrove plants, food and drinks, with technology facilitating the promotion of tourism. It's good to improve agricultural technology starting from the regions and finding superior commodities in those areas, as well as the role of the government which provides a lot of training and outreach about agriculture in the digital era." [1]

Of course, millennials who are close to the digital world can making digital platforms the basis of their work. Maybe millennials are not involved in the field like conventional farmers. But they are involved in developing applications in the digital agriculture ecosystem. Currently, several millennial children are starting to see their role in the digital world of agriculture, but in terms of numbers it is not too large. Therefore, it is necessary to create broadly agricultural-based digital economic actors. Modern agriculture also includes the use of technological innovations in the production process. The goal is clear, so that agricultural productivity increases. The role of agricultural graduates is very much needed at this point. In the end, it will attract the interest of educated millennials to build the agricultural sector. By itself the education of farmers will increase.

Head of Agricultural Human Resources Extension and Development Agency (BPPSDMP) of the Ministry of Agriculture (Kementan), Dedi Nursyamsi; that to encourage a digitally literate millennial farmer program is actually in line with the roadmap for the human resource development (HR) program in the agricultural sector to encourage one million millennial farmers each year. Indonesian agriculture must be supported by superior human resources to be able to innovate and adapt to technology.

The West Java Provincial Government quickly responded by issuing its millennial farmer program. The Millennial Farmer Program aspires to encourage workforce regeneration in the West Java agricultural sector that has innovation, ideas and creativity through the use of digital technology. Of course, this program can be a reference for other regions.

The discourse on digitally literate millennial farmers will be raised in the Agricultural Census which will be carried out by BPS in 2023. Interesting to see the results. Are Indonesia's millennial farmers increasing as a result of increased internet literacy during the pandemic? Or vice versa. Of course, the results of the Agricultural Census will become important information for future agricultural development planning. Because the relay of agricultural development will be handed over to the younger generation.

The results of discussions with several lecturers at the Faculty of Agriculture, Malikussaleh University, illustrate that digitalization is a change from the conventional way to a digital system with the help of equipment and internet networks. With a digital system, it can bring together farmers and consumers more easily. Farmers no longer need to depend on bench toke, middlemen or distributors. Farmers can raise the selling price which is usually cut by bench toke, middlemen or distributors. However, technology education needs to be held first so that farmers can be more educated and critical in their use. In addition, the existence of digital technology such as applications related to agriculture can also make this sector look more promising for the younger generation. Digital technological innovations can direct the younger generation to see the potential of the agricultural sector again.

The presence of digital innovation can improve the quality of the agricultural sector, not only in managing agricultural land but also in human resources. The agricultural sector which is synonymous with conventional activities has proven to be able to survive and keep up with rapid digital changes, the government and relevant stakeholders must launch programs that can improve the welfare of farmers in realizing food sovereignty.

4. CLOSING

4.1. Conclusion

Conclusions and suggestions for the results of the research include *first*, the understanding of digital farming and smart farming among Millennials of Malikussaleh University agricultural students is only limited to knowing they do not understand in depth. Maximum implementation of smart farming is a big hope for all. Digital agriculture as an implementation of smart farming or precision agriculture which is expected to be able to realize a sustainable agricultural system. Agriculture in the digital era does not only work conventionally by going directly to agricultural land but is broader than that. Various processes in the agricultural system will take advantage of the application of technology.

Smart agriculture is implemented based on integrated principles between management information systems, precision technology, and cyber physical systems. The sustainability of digital agriculture is highly dependent on the availability of big data, availability of internet networks, management institutions, competent human resources, government regulations, government funding support, and of course farmer participation. The Ministry of Agriculture has provided support to welcome the Indonesian agricultural era 4.0. All sectors have implemented digitization, using technology and mechanization

Second, understanding digital skills as the main requirement for digital farming and smart farming, has relatively understood that digital skills are related to individual abilities to know, understand and use digital operating system hardware and software. Includes the ability to find, work on, evaluate, use, make and use it wisely, intelligently, carefully and precisely according to its use. In general, they understand that mastery of digital technology is absolutely necessary in order to get the maximum benefit from agriculture. Related to digital communication, managing information, creating content, conducting digital transactions, finding solutions, maintaining digital security, digital culture and netiquette or digital ethics.

Third, to attract millennials to the fullest in the agricultural sector, with technological and digitalization capabilities. The stigma of agriculture only for those with low education seems to still exist. Those with relatively high education do not look at the agricultural sector as a work destination. Even those who graduated from the agricultural department. The suggestion is that efforts are needed to encourage the interest of the millennial generation, including those with higher education, to build an agricultural sector that is appropriate to the era. Agriculture that is converted between conventional-traditional agriculture, becomes agriculture that is literate with digital technology.

Fourth, human resources for digitizing agriculture are still lacking. Technology is still conventional, the added value of products is still low because the main exports are still in the form of raw materials and the contribution of innovation to economic growth is still small. His advice is to accelerate technological transformation and innovation as well as prepare and encourage millennials, especially agricultural students, to develop smart agriculture or *smart farming*.

4.2. Suggestions

for Education curriculum; that education in the realm of digital skills in the world of agriculture is a joint effort to produce millennial farmers who have output *qualified job creators*, namely independent farmers who are able to open business opportunities for their colleagues and qualified job seekers, namely millennials who are skilled and master their jobs so that they can be placed anywhere in the all sectors of business and industry. Education where most of the time is used for teaching factories so that graduates will directly practice in the field.

Through an independent campus forum by utilizing technology and the agricultural sector, it will certainly produce agricultural students who understand contextually about the agricultural sector so that they can provide benefits to the wider community. As a result, the agricultural sector is a prospect for millennials to further develop their skills and capabilities in digitalization in optimizing the agricultural sector so that they can realize food security that is sovereign on its own feet.

Synergy; the government, universities, the private sector and related stakeholders must carry out transformations for outputs and outcomes in developing job creators or agrotechnopreneurs. To produce millennial farmers who are able to apply and are proficient in digital farming technology and smart farming. Implementation of on-farm activities as capital-intensive activities with technology and innovation. So as to be able to manage agricultural products, innovation-based agro-industry to increase competitiveness and added value of agricultural products, including more efficient marketing by utilizing digital-based technology.

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