Responses to Covid 19 for Sustainable Agriculture Transformation

Editors:
Musa Hubeis | Eko Ruddy Cahyadi | Zuraina Dato Mansor
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Preface from IPB University Rector

Prof. Dr. Arif Satria, SP, M.Si

Assalamu'alaikum Warohmatulloohi Wabarokaatuh,

Greetings everyone. It is my great honor and delight to greet all of you, and to particularly extent a warmest welcome virtually to the distinguished guest speakers and all participants in The 5th Sustainable Agri-food Management in Indonesia (SAMI) Summer Course and the 3rd Batch of SAMI Essay Competition.

SAMI 2021 will be one of the most interesting summer course focus on sustainable management and innovation. The theme, "Responses to Covid-19 for Sustainable Agriculture Transformation", is very relevant with recent condition. This summer course can be an arena for getting to know each other while sharing ideas and information in an effort to create collaboration in disruptive era.

We've seen a lot of changes have happened due to the Covid-19 pandemic in each sectors. Therefore, I hope this Summer course will create a unique opportunity of exchanging view, experiences and sharing good ideas, particularly in the field of management in this pandemic era.

On behalf of IPB University, I would express my sincere gratitude to all stakeholders, especially for the organization committee, reviewer, Company and University partners. They have worked very hard in organizing and reviewing papers. We also would like to express our gratitude to invited speakers and moderators in the day of Summer Course.

We hope that SAMI 2021 will be successful and enjoyable to all participants

Rector

Prof. Dr. Arif Satria

Preface from Dean of Faculty of Economics and Management

Prof. Dr. Ir.
R. Nunung Nuryartono, M.Si

I would like to express my gratitude to Department of Management as an organizer and also to all the committees who have dedicated their time and contribution for Sustainable Agri-food Management in Indonesia (SAMI) Summer Course 2021. I would extend my sincere gratefulness to our international lecturer, local lecturer, and practitioners on agri-food business.

It is our pleasure to present this Book Chapter consisting of selected papers based on Essay Competitions, held September 14th - 24th 2021 virtually. The SAMI 2021 summer course is designed as 10 days sustainable agri-food management course with input from IPB University experts in collaboration with international Universities and multinational food companies, Banking and Technology Companies. Relevant issues in the field of sustainable agri-food management have been presented and discussed in the virtual plenary presentations. The topic of this summer course is “Responses to Covid-19 for Sustainable Agriculture Transformation”.

The Covid-19 Pandemic has changed the way of doing business and managing the organization. Therefore in this pandemic era, we should adapt especially on agriculture, focus on digitalization, and make some innovations, in the case of the supply chain of agriculture as a whole. However, in Indonesia, there are still many obstacles faced, especially the inefficient distribution chain, limited market access as the farmers rarely able to sell to large retailers, and payment conditions that burden buyers. Solutions to improve the agricultural sector in Indonesia are very important in order to improve the welfare of farmers, business people and to fulfill community needs for good quality agricultural products. This is closely related to the future goals of the SDGs regarding welfare and food security in the future. Through this summer course we could learn about integrated agri-food value chain from upstream to downstream and from traditional mechanism to digital transformation in agricultural sector.

We would like to take this opportunity to extend our gratefulness to the following reviewers of the Essays submitted for consideration in this volume for having so generously shared their time and expertise: Prof. Dr. Ir. Musa Hubeis, Dr. Eko Rudy Cahyadi, Assoc. Prof Madya Dr. Zuraina Dato Mansor, Sidortun Naim PhD, Mrs. Rindah F. Suryawati, Mrs. Nisa Zahra, and Mrs. Lindawati Kartika. Finally, we wish to thank the IPB Press for supporting us in publishing this Book of SAMI 2021.

Bogor, September 24th 2021

Dean of FEM IPB University

Preface from Head of Editorial Board

Prof Dr Ir Musa Hubeis Dipl Ing DEA

This issue of Sustainable Challenges in the Agri-food Sector and Management is the second to appear under my editorship. This Book of Essays is organized by Department of Management, Faculty of Economics and Management and its Authors represents region Asia in particularly from Nigeria, India, Vietnam, Indonesia, Malaysia, Philippines, Thailand, and Republic of China (RRC). The publisher, IPB Press, SAMI Chairman and SAMI Essay Contest Chairman Mrs. Lindawati Kartika and the commitees of SAMI 2021, who have also made outstanding contributions to the growing of this book.

Agriculture is one of the most important sectors for humankind, but today's agriculture still facing many problems to fulfil the needs of people. Although technological development has been improving rapidly, but it is also cannot be implemented fully in agricultural sector due to the lack of some resources. As stated in United Nations about Sustainable Development Goals (SDGs) for its 193 member countries, it explicitly set a goal about Responsible Consumption and Production in SDG number 12 that support the sustainable development including in agricultural

sector by producing more and minimizing the cost and emission produced. SDG number 2 Zero Hunger also set the purpose to rethink how we grow, share and consume our food. If done right, agriculture, forestry and fisheries can provide nutritious food for all and generate decent incomes, while supporting people-centered rural development and protecting the environment. This meaningful purpose is the key to be able to keep innovating for better agriculture development in all over the world. It also the aim of this book of sustainable agri-food sector and management to participate in giving solutions and ideas for Sustainable Agri-food Management in Indonesia and further be implemented for other countries.

The contribution of the authors is classified into seven categories which are Sustainable Agri-food Supply Chain Management, Inclusion of Smallholder Farmers and Collaboration System, Digital and Technology Innovation/Added Value, Agri-business Development, Human Resources, Change Management and Innovation, Sustainable Food Production, and Halal Management System. The importance of the agri-food industry to all three pillars of sustainable effectiveness and predictions about the inability to feed future populations gives the discussion a certain urgency. Findings: Sustainability oriented innovations in the agri-food supply chain are different from traditional innovations. We develop propositions regarding the driving motivations, their nature and scope (i.e., more radical and systemic than incremental and focused), and the importance of a multistakeholder approach. The ten cases presented in the volume are summarized.

Finally, on behalf of myself, the Head of editorial Board, The Editorial Board, Dean of Faculty of Economics and Management IPB University, Head of Department of Management, the Commitees of SAMI Summer Course, and Content Designer Citra Marcella Nazira, Irsa Adwinanda Rahmatalitha, Muharamah Ansi Putri, Yunicha Elisabeth Sihotang, and IPB Press, I want to convey our general thanks to the authors and reviewers. It is them who have primary responsibility for the actual content and the success of Sustainable Challenges in the Agri-food Sector and Management Book Volume 3.

September 2021

Head of Editorial Board

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Sustainable Agri-food Supply Chain Management

NO. Registration: 006/SEC/I/9/21

Alternative Healthy Menu During The Pandemic For Sustainable Agri-Food Supply Chain 5.0

Sri Wahyuni[1], Nurul Hidayati[2], Rudi Triyono[3], Sintya Ismana Gardenia Tanaya4
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COVID-19 outbreak has been identified in Wuhan in 2019 (Biyan and Hyeon 2021). This virus kills 1.5 million people in 2020 (Philips 2021). Due to its rapid and massive spread, COVID-19 has been declared a pandemic (Singh and Mishra 2021). The spread of COVID-19 in Indonesia increased to 3.4 million people who were confirmed positive in July 2021 (Ministry of Health 2021). The number of COVID-19 cases is the highest in Indonesia compared to WHO standards.

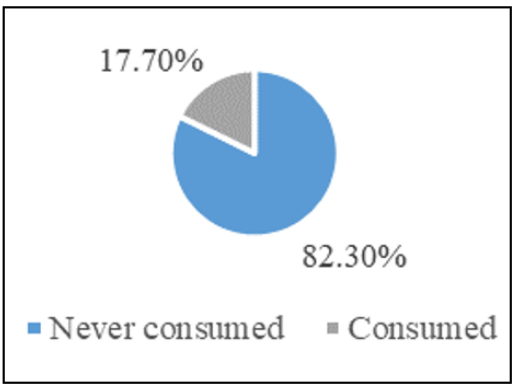
The increase in cases due to COVID-19 is thought to be related to the problem of obesity (AccessScience 2020. In a 2020 US survey, 77% of the 17,000 people hospitalized for COVID-19 were overweight (29%) and obese (48%) (Goma 2021). Analysis of data on COVID-19 patients shows that people who are overweight (BMI 25–29.9) also have a higher risk of contracting COVID-19 compared to individuals with a healthy Body Mass Index (Wadman 2020).

People with high BMI, usually make various efforts such as diet programs to avoid obesity. However, modification of consumption patterns due to limited access to certain foods causes an increase in consumption of unhealthy menus (Mattioli et al 2020). These changes encourage the microbiota to influence the body's nutrient absorption (Krajmalnik-Brown et al. 2012), impacting the immune system.

Innovative solutions are needed to overcome these problems through the use of local tubers as a source of functional food for obese people, export commodities, and sources of sustainable supply chains. One of them is porang with abundant availability and a glucomannan content of 64.98% (Yuniawati et al 2021). Based on the description above, it is necessary to conduct further studies on "Healthy Menu Alternatives in the Pandemic Period Towards Sustainable Agri-Food Supply Chain 5.0".

Knowledge and Public Perception of Porang

Porang (Amorphophallus oncophyllus Prain) is a bulbous plant with bumps on branches and leaf axils (Hamdhan 2021). Porang thrives in tropical and subtropical areas. However, not many Indonesian people cultivate it because it is still considered a wild plant.



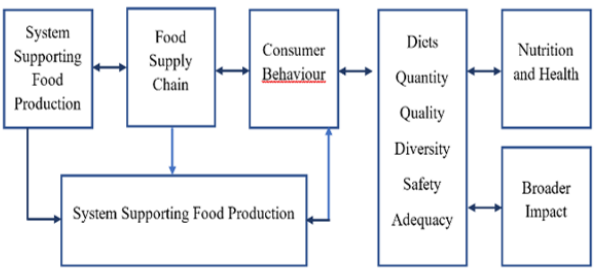
Picture 1. Results of the public consumption survey of Porang

Based on survey of 450 respondents on August 2021 by online, about 57.20% knew about porang while 42.80% did not know about porang. However, the data showed that 17.70% of respondents who knew porang have ever consumed it while 82.30% had never. It also shows where 76.60% do not know that porang can be used as a diet menu.

However, 40,80% of respondents consider its use as a diet menu. This can be interpreted that porang has a high chance as an alternative to a healthy menu, especially for diet.

Porang has a high glucomannan content (Nurlela et al. 2021) of 64.98% (Yuniawati et al. 2021) and is low in calories which can be used as an alternative food ingredient for diet menus (Juliana et al. 2020). Glucomannan is composed of the monomers D-Glucose 33% and D-mannose 67% (Wardhani et al. 2020). With this content, porang can be used as diet menu for diabetics. Diabetes is one of the congenital diseases that are more difficult to recover from for Covid-19 sufferers[1)]. One of the efforts that can be done is to arrange a menu with healthy food.

In addition, to ensure the availability of porang in the community, it is necessary to manage the porang supply chain that integrates all supply chain stakeholders. The porang supply chain involves suppliers, producers, and consumers, namely farmers, middlemen, and entrepreneurs. Based on FAO et al (2020) about Food Security and Nutrition, consumer behavior affects the supply chain, so special treatment is needed to facilitate supply chain flow. The following is a flow chart of the supply chain mechanism for the food industry sector.



Picture 2. Food supply chain flow chart (source: FAO et al., 2020)

One of the supply chain management approaches that can be enforce in the future is the supply chain 5.0 sustainability. However, now it is necessary to approach the community as an active target for developing the potential of porang. It is hoped that in the future a massive and balanced collaboration between the environmental, human, and technology industries can be implemented (Frederico 2021). Thus, porang and its processed products can be found easily in the community.

Potential of Porang as a Healthy Processed Menu

Porang has potential as a substitute for rice in meeting carbohydrate needs because of its high starch content of 77% (Juliana et al. 2020). Based on the survey, there are several processed porang offered, 68% of respondents chose processed in the form of chips, 43.5% pastries, 23% cakes, and 16.6% in the form of juice and the rest is jelly, shirataki, flour, candy, and supplements. This shows that the majority of respondents believe that porang can be processed into healthy food. It can be assumed that the market for porang products is wide open.

However, limited public knowledge regarding porang requires education through campaigns, training, workshops, and webinars. The program can be carried outside by side with food diversification efforts by the government by utilizing local ingredients. The program has also been supported by the government through the Roadmap for Diversification of Local Food Sources of Carbohydrates to Replace Rice for 2020–2024 (Food Security Agency 2020).

In addition, porang has the potential as an export commodity, considering that the number of porang in Indonesia is quite large. It was recorded that Indonesian porang exports in 2020 increased to 11.70 million tons (Hamdhan 2020). Porang exports have been carried out to several countries such as Malaysia, Japan, Pakistan, Italy, and England.

[1] on https://www.kemkes.go.id/article/view/20102100001/komorbid-jadi-penyebab-terbanyak-kematian-pasien-covid-19.html

Production on a large scale can increase Indonesia's GDP. Thus, porang has the potential as a healthy food menu and export commodity.

Based on the description above, the majority of Indonesian people do not know about the porang plant. Porang has the potential as an alternative food during the pandemic. The content of glucomannan can be a potential low-calorie healthy food menu substitute for staples. In a pandemic, obese people are most vulnerable to exposure to the COVID-19 virus and even death. So based on the description above, the porang plant has the potential to be used as an "Alternative Healthy Menu in the Pandemic Period Towards Sustainable Agri Food Supply Chain 5.0". In addition, the abundant potential of the porang plant can be used as an opportunity for supply chain 5.0 agents for the food and manufacturing industries in Indonesia to help increase the country's foreign exchange income sources in the future.

REFERENCES

Acces Science. The relationship between obesity and COVID-19. 2020. https://doi.org/10.1036/1097-8542.BR1002201. Diakses 15 September 2021.

Biyan N., H., Hyeon J., Y. 2021. Neurological symptoms, manifestations, and complications associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease 19 (COVID-19). Journal of Neurology. 268:3059–3071.

FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Available at: http://www.fao.org/documents/card/en/c/ca9692en/. (Accessed at September 20, 2021).

Food Security Agency. 2020. Roadmap Diversifikasi Pangan Lokal Sumber Karbohidrat Pengganti Beras tahun 2020– 2024. Jakarta.

Frederico G., F. 2021. From Supply Chain 4.0 to Supply Chain 5.0: Findings from a systematic literature review and research directions. Journal Logistic. 5(49): 1-21. Available at: https://doi.org/10.3390/ logistics5030049. (Accessed at September 18, 2021).

Goma E., I. 2021. Dampak kasus CVID-19 terhadap isu kependudukan di Indonesia. *Jurnal Kajian Ilmu dan Pendidikan Geografi*. 5(1): 33-42.

Hamdhan R., A. 2021. Dampak usahatani komoditas porang terhadap kesejahteraan masyarakat di Desa Klangon, Kecamatan Saradan, kabupaten Madiun. *Jurnal Agribisnis dan Sosial Ekonomi Pertanian.* 5(2): 125-138.

Juliana A., I., Nazaruddin, Amaro M. 2020. Pengaruh konsentrasi starter bakteri *Lactobacillus plantarum* terhadap beberapa komponen mutu tepung porang (*Amorphophallus oncophyllus*). *Jurnal Ilmu dan Teknologi Pangn.* 6(2): 673-684.

Krajmalnik-Brown, R., Z. E. Ilhan, D. W. Kang, and J. K. Dibaise. 2012. Effects of gut microbes on nutrient absorption and energy regulation. Nutrition in Clinical Practice 27 (2):201–14. doi: 10.1177/ 0884533611436116.

Mattioli, A. V., M. Ballerini Puviani, M. Nasi, and A. Farinetti. 2020. COVID-19 pandemic: The effects of quarantine on cardiovascular risk. European Journal of Clinical Nutrition. 74:852–55. doi: 10.1038/ s41430-020-0646-z.

Ministry of Health. 2021. Ikhtisar Mingguan COVID-19 di Indonesia. https://www.kemkes.go.id/downloads/resources/download/ laporan-mingguan-covid/Laporan-Mingguan-Penanganan-Covid-19_Juli-30.pdf Nurlela, Ariesta N., Laksono D., S., Santosa E., Muhandri T. 2021. Characterization of Glucomannan Extracted from Fresh Porang Tubers Using Ethanol Technical Grade. *Journal of Molekul.* 16(1): 1-8.

Philips N. 2021. The coronavirus will become endemic. Nature. Vol. 590: 382-384.

Singh V., Mishra V. 2021. Coronavirus Disease 2019 (COVID-19): Current Situation and Therapeutic Options. Coronaviruses. 2(4): 481-491.

Wadman M. 2020. Why obesity worsens COVID-19, *Science*, 369(6509):1280–1281. DOI: https://doi.org/10.1126/science.369.6509.1280

Wardhani D., H., Rahayu l., h., Cahyono H., Ulya H., N. 2020. Purification of Glucomannan of Porang (Amorphophallus oncophyllus) Flour using Combination of Isopropyl Alcohol and Ultrasound-Assisted Extraction. *Journal of Reaktor.* 20(4): 203-209.

Yuniawati I., Pamuji D., R., Trianasari E., Rahayu N., S., Ulfiyati Y. 2021. Pembuatan tepung porang sebagai upaya peningkatan penjualan umbi porang di masa pandemi covid-19. *Jurnal Inovasi Hasil Pengabdian Masyarakat.* 4(2): 231-240.

NO. Registration: 043/SEC/I/9/21

Covid-19's Effect To The Philippine Supply Chain

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If one will ask a Filipino child what they want to grow up, the child will most likely say they want to be a doctor, nurse, police, engineer, or actor. It is rare for them to mention the word farmer, although they live in an agricultural country. Farming is not seen as a promising career in the Philippines. Even farmers themselves encourage their children to pursue a different career from farming. A country that empowered its neighboring countries about agriculture can't even empower itself. This is the sad reality of Philippine agriculture. The problem in agriculture is further emphasized when the Philippines was put under lockdown due to the pandemic. This paper will discuss the most impactful problem of the pandemic in the Philippine agricultural sector which is the disruption in the supply chain. Moreover, this paper will tackle the different stakeholders involved in the problem. In the last part of the paper, the writer will share her suggestions on how the state can approach this pressing issue in agriculture.

A Domino Effect

In March 2020, President Rodrigo Duterte announced a lockdown, on the whole, the island of Luzon in the hopes of containing the virus (Petty & Morales, 2020). Hence, transportation of goods has been extra difficult. Agricultural goods, such as fruits and vegetables, come

from the northern and southern regions of Luzon and are distributed to different parts of the island. The National Capital Region (NCR) also depends on the supply from these regions. Checkpoints hinder the fast mobility of vegetables and fruits, which are highly perishable. Some are lucky enough if their crops were bought by an LGU, NGO, or private sector. If not, then their crops are left in the field rotting (Dy, 2020). The restrictions also influenced the distribution of livestock, poultry, and fisheries, which influenced the dropping of the value of production by 12.9%, 5.5%, and 4% respectively (Philippine Statistics Authority, 2021 as cited from Rivas 2021).

According to the National Economic and Development Authority, "the agricultural sector lost an estimated Php 94.3 million (about $1.9 million) from unsold produce from key producing regions supplying most of the food requirements of major demand centers" (United Nations, 2021). Small scale farmers and fisherfolk are tremendously affected by the loss in the agricultural sector. Regardless of the financial assistance from the government, farmers and fisherfolk are usually said to be unqualified or "could not encash the money due to limited time allotment in some communities." (Novio, 2020).

This issue about the supply chain is like a domino effect. If the supply is limited the price of goods will increase because of the increasing amount of demand. The limited supply of fruits and vegetables in the market will lead to price hikes due to the increasing demand for them. Unfortunately, several individuals lost their jobs because of the closing of many businesses. Therefore, the increase in the price of fruits and vegetables will hinder many to have enough nourishment they need to survive this pandemic. According to SWS National Survey (as cited from Bejeno, 2021), "estimated 5.2 million Filipino families experienced involuntary hunger in 2020". Furthermore, "The hunger rate increased by 4.2% from 16.7% between May and July 2020, and by 12.1% from 8.8% in December 2019." (Bejeno, 2021). Besides hunger, having the proper nourishment for the body is immensely important in a time of

pandemics. Having a healthy body is essential to combating the virus. However, how can one afford to be healthy if you lost your job and the food supply is limited? Everything seems to be a luxury when you are in a pandemic.

Is There a Way Out?

Even if you are in a dark tunnel, if you keep moving forward, you would find your way out. However, we just can't keep moving forward. We need to move forward with wisdom, empathy, and determination. Wisdom to correct what was wrong and to prepare for the future. Empathy to serve and empower people that are left behind by society. Lastly, determination to rise above all the problems and fulfill until the end the task we signed up for. These traits are not for the farmers, fishermen, and other members of the agricultural community. They have more than enough of these traits. The people in the government are the ones needing these characteristics. They need to learn from the people they are serving.

They need to have the wisdom to conceptualize policies to correct their unsuccessful plans. Wisdom to always have a sense of preparedness no matter what season comes in the country. It is also very advisable for them to practice empathy for them to have a sense of urgency to help the people in the agricultural sector. They must combine it with determination to help the agricultural community put itself back on its feet. Because truth be told, this pandemic is not the root of the problem. It is the lack of character in the people who are expected to be for the people and not the other way around.

REFERENCES

Bejeno, C. E. (2021, April 30). *COVID-19 and the 'collapse' of the Philippines' agricultural sector: a double disaster*. blISS. https://issblog.nl/2021/04/30/covid-19-covid-19-and-the-collapse-of-the-philippines-agricultural-sector-a-double-disaster/#_ftn3

Dy, R. T. (2020, June 15). *Philippine agriculture and COVID-19 impact*. BusinessWorld. https://www.bworldonline.com/philippine-agriculture-and-covid-19-impact/

Novio, E. (2020, May 19). *Webinar Report: Farmers, fisherfolk lament limited aid, logistical challenges brought by COVID19.* Greenpeace. https://www.greenpeace.org/philippines/story/9589/webinar-report-farmers-fisherfolk-limited-aid-logistical-challenges-covid19/

Petty, M. & Morales, N, J. (2020, March 16). *Duterte puts Philippines under quarantine, says 'we are in the fight of our lives'.* Reuters. https://www.reuters.com/article/us-health-coronavirus-philippines-idUSKBN2130W4

Riva, R. (2021, Jan. 27). *'Perfect storm': Philippine agriculture shrinks 1.2% in 2020*. Rappler. https://www.rappler.com/business/philippines-agriculture-growth-q4-2020

United Nations Philippines. (2021, August). *Urban Food Systems and the Pandemic: Assessing the Impact of COVID-19 on Food Systems and Adaptive Measures Practiced in Metro Manila. https://philippines.un.org/sites/default/files/2021-08/Urban%20Food%20Systems%20and%20the%20Pandemic.pdf*

NO. Registration: 070/SEC/I/9/21

Regional Food Hubs For A More Sustainable and Resilient Agri-Food Industry

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Currently, the agri-food industry has to adjust and tweak some of its systems to accommodate the impact of the COVID-19 pandemic. Although the quantity production of agri-food stayed relatively constant, the logistics and demand of the agri-food industry were disrupted during the pandemic (Gunawan *et al.* 2020). This problem happened because of the shorter work hours in both public and private agencies that the government implemented to minimize the transmission of the virus (Perdana *et al.* 2020).

Meanwhile, agri-food products are perishable and require extensive logistics care (Perdana *et al.* 2020). A longer supply chain process means more food can rot before reaching customers, and prices rise significantly. Higher prices and lower incomes will reduce the quality of food for consumers and the quantity of demand for the farmers. (The World Bank 2021). This condition also has implications for the availability of food for customers and the financial success of farmers. During the pandemic, farmers experience a higher level of losses because of the longer supply chain.

To face these problems, the agri-food industry in Indonesia needs a system that can control the price and improve the effectiveness of supply and chain (Rozaki 2020). With Regional Food Hubs (RFHs), the agri-food

industry can be more sustainable. In general, RFHs manage products from local farmers from the collection process until they reach customers. In the process, RFHs work by connecting with local communities, selling to broader markets outside the region, sharing information among value chain partners, establishing standards of operation and products, negotiating prices, and many more (Winarno *et al.* 2020a).

The difference between RFHs and other enterprises is that RFHs focus not on profit. RFHs focus more on meeting the supply and demand of agri-food products to avoid rising prices of agri-food commodities and provide stability for both customers and farmers (Perdana *et al.* 2020). RFHs create a system so that the supply from farmers matches the demands of customers. They do this by analyzing the regional market's buying patterns and negotiating prices.

In the center of the system, Regionally Owned Enterprises (BUMD) work together with local farmers (Winarno *et al.* 2020b). BUMD is responsible for purchasing products from farmers and analyzing the market demand and balancing the two. During the pandemic, RFHs can also work to set up a standard so that the products can sustain the longer process of the supply chain during the pandemic (Perdana *et al.* 2020). Some of the measures that they can put into practice are improving warehouse quality, ensuring cold-chain availability, implementing the first-in-first-out system, and even adding an online management system to improve the accuracy of management. Local farmers, in return, work together with BUMD to establish and follow farming plans according to the analysis done by BUMD (Winarno *et al.* 2020b) and follow the established standards from BUMD.

BUMD also manages to sell the products in a variety of places including people's markets, modern markets, restaurants, hotels, catering companies, the processing industry, and many more (Winarno *et al.* 2020b). BUMD can also work with nearby production areas to supply their hubs. With access to a broader market, farmers will benefit from

the sales. Through food hubs, agri-food logistics can be improved so that food suppliers from both urban and rural areas can be better connected (Perdana dan Hermiatin 2019).

So far, the development of Regional Food Hubs in Indonesia is still in its early stages. However, the urgency to build a more sustainable agri-food industry during the pandemic has propelled the support for Regional Food Hubs to increase significantly. In August 2020, the Ministry of Transportation expressed the need to improve the sea, air, and land transportation modes to help improve the effectiveness of RFHs, especially in remote areas such as the Kalimantan island (Biro Komunikasi dan Informasi Publik 2020). This action was a form of response from the government after the World Health Organization warned of the possibility of experiencing a food crisis during the pandemic. The Ministry of Agriculture also planned for Functions of the Agricultural Development Strategic Command (KostraTani) to develop RFHs (Praghotsa 2021).

There is an urgency in building a sustainable industry against the COVID-19 pandemic. In the case of Indonesia, the agriculture sector still holds the highest number of employment (Lukman 2021). The establishment of effective RFHs should be accelerated. Because of that, the establishment of RFHs should not depend only on the government's plan.

To acquire more funds, RFHs can appeal to philanthropic and private institutions. Funds can provide broad benefits for many actors such as broadening the RFHs' scope, creating more environmentally sustainable forms of production, improving digital literacy for farmers, and many more. Because of the all-encompassing nature of RFH, when sending for an appeal, RFHs need to choose the specific goals that they want to accomplish from the funds (Barham *et al.* 2012). RFHs can also appeal by bringing the urgency to improve RFHs as a means to respond to the impending crisis during this pandemic.

During the pandemic, everyone struggles. However, as an agrarian country, Indonesia should give a special focus on the industry that is responsible for maintaining food security, and providing jobs for a significant portion of its people. With RFS, all the crucial links for creating a resilient and sustainable agri-food industry can meet, and work together to prevent food insecurity while maintaining the welfare of farmers.

REFERENCES

Barham J, Tropp D, Enterline K, Farbman J, Fisk J, Kiraly S. 2012. Regional Food Hub Resource Guide. *US Dept Agric Agric Mark Serv*. April:92.

Biro Komunikasi dan Informasi Publik. 2020 Okt 20. Kemenhub Dukung Kelancaran Distribusi Logistik Di Kawasan Lumbung Pangan Nasional di Kalteng. *Ber Umum*., siap terbit. [diakses 2021 Agu 19]. http://dephub.go.id/post/read/kemenhub-dukung-kelancaran-distribusi-logistik-di-kawasan-lumbung-pangan-nasional-di-kalteng.

Gunawan E, Sumaryanto, Ashari. 2020. Peningkatan Produksi Padi Pada Era Pandemi Covid-19. *Dampak Pandemi Covid-19 Perspekt Adapt dan Resiliensi Sos Ekon Pertan*. Bps 2018:173–192.

Lukman AS. 2021 Jun 8. Recovery calls for a robust agrifood industry - Opinion - The Jakarta Post. [diakses 2021 Agu 19]. https://www.thejakartapost.com/academia/2021/07/07/recovery-calls-for-a-robust-agrifood-industry-.html.

Perdana P, Hermiatin FR. 2019. Rantai Pasokan Cerdas; Menyajikan Peluang Yang Belum Pernah Ada Sebelumnya Untuk Mengelola Rantai Pasokan Pertanian. *Talent Conf Ser Energy Eng*. 2(4):312–319. doi:10.32734/ee.v2i4.685.

Perdana T, Chaerani D, Achmad ALH, Hermiatin FR. 2020. Scenarios for handling the impact of COVID-19 based on food supply network through regional food hubs under uncertainty. *Heliyon*. 6(10): e05128. doi:10.1016/j.heliyon.2020.e05128.

Praghotsa KA. 2021 Feb 14. Perhepi ke-52, Kementan Perkuat KostraTani sebagai Hub Pemberdayaan Petani. *Ber 2 Bhs*., siap terbit. [diakses 2021 Agu 19]. https://www.berita2bahasa.com/berita/08/1621142-perhepi-ke-52-kementan-perkuat-kostratani-sebagai-hub-pemberdayaan-petani.

Rozaki Z. 2020. COVID-19, Agriculture, and Food Security in Indonesia. *Rev Agric Sci*. 8:243–260. doi:10.7831/RAS.8.0_243.

The World Bank. 2021 Agu 17. Food Security and COVID-19. *Brief*., siap terbit. [diakses 2021 Agu 19]. https://www.worldbank.org/en/topic/agriculture/brief/food-security-and-covid-19.

Winarno H, Perdana T, Handayati Y, Purnomo D. 2020a. Food hubs and short food supply chain, efforts to realize regional food distribution center (Case study on the establishment of a food distribution center in Banten province, Indonesia). *Int J Supply Chain Manag*. 9(3):338–350.

Winarno H, Perdana T, Handayati Y, Purnomo D. 2020b. Regional Food Hubs for Distribution of Regional Food Logistics (Case Study on the Establishment of a Food Distribution Center in Banten Province, Indonesia). *IOP Conf Ser Mater Sci Eng*. 771(1). doi:10.1088/1757-899X/771/1/012068.

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Building Resilience Across The Food Supply Chain: Amidst of Covid-19

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Building Resilient Across Food Supply Chain in the Midst of Covid-19 pandemic has caused direct and indirect disruption to the agricultural sector and will have long-term effects on the industry after the pandemic ends (Barbosa, 2021). According to the IMF economic survey in June, the global economic situation is sharply declined by 4.9% in 2020, worse than the financial crisis in 2008- 2009 (IMF, 2020). The economic chaos due to the outbreak has destabilized the existing discrepancies in the food supply around the world. Though the COVID-19 pandemic itself may not necessarily create food shortages, it has already created disruptions along the food supply chain where it limits the labor mobility and difficulty to access markets. The food supply chain, one of the most important sectors of the economy, refers to the process of how raw materials transform into end products that the consumers buy in the market. Five stages are involved in the food supply chain, including agricultural production, postharvest handling, processing, distribution, and consumption (Aday & Aday, 2020).

The impact on the food system has demonstrated the weakness of the supply chain. Improving the stability of the food system is also related to the food supply chain that Zainuri, 2020). The main actors directly and indirectly involved in gaining resilience in the food supply chain are farmers, processors, retailers, consumers, and the government (Kamrath et al., 2019). Among the issues that occur between the parties involved in this food chain are producers being restricted to international markets, food processors refusing to go to work, thinking that they will get sick at work, food transportation hindering logistics to distribute commodities, and consumers becoming more concerned on food security (Aday & Aday, 2020). Because a food supply chain is domino-like when one part of the food supply chain is affected, the whole food supply chain is affected (Vijayalakshmi et al., 2020). Thus, resilience is important to maintain the stability of the food chain despite any challenges.

Resilience is defined as "the ability to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover from them in a timely, efficient and sustainable manner" (FAO, 2018). The definition encompasses the ability to respond, cope with interference, and at the same time be able to maintain the same function in the long run.

Currently, the food systems are not sustainable which shows that it is essential to stabilize the food production especially in this time of pandemic where resiliency is a great concern for every people. Therefore, this paper provides an overview of several potential mitigations to improve resilience across the food supply chain from production, processing, and distribution to consumers during the COVID-19 crisis.

Agricultural Production

Agricultural production is a key element in the food supply chain. If there are constraints in the production of agricultural products, especially in terms of lack of agricultural supply due to road restrictions, work

restrictions, fears of virus transmission among farmers, local and global food demand will be disrupted and thus affect food security status. Therefore, several mitigations are needed to cope with these problems.

Among the methods that can be carried out is by conducting farm diversification. This method refers to the retention of various production systems and diversifies sources of what is produced in the agricultural landscape from time to time such as through mixed farming or crop rotation. This diverse agricultural system will thus contribute to resilience in a variety of ways, ranging from reducing the issue of pests and diseases in agriculture to increasing production and reducing the impact of climate change (Sales et al., 2017).

Besides, sustainable intensification of agriculture is among the mitigations that can be done (Sales et al., 2017). It involved best agronomic methods to adapt to climate change, to maximize the yield production than input such as land and water, and at the same time help to minimize the negative effects of the environment such as deforestation. The same goes for climate change of agricultures that aims to enhance the productivity of agriculture to increase farmers' income, food security, and development; help to boost the multiple levels capacity from farm to the nation, and to reduce the high level of carbon sinks and greenhouse gas emissions.

The use of digital access-based farm mechanization can increase production as well as reduce the inputs used (Panetto et al., 2020). This can help farmers to produce agricultural products without having to obtain high-cost agricultural equipment. In addition, the use of technologies such as the Internet of Things (IoT) and Cyber-Physical System (CPS) in agriculture can be effective real-time monitoring (Panetto et. al., 2020). With the use of technology as well, the problem of constraints to go to work due to the worry of virus transmission can be reduced. This can optimize agricultural production in any situation and can enhance resiliency.

Access to agricultural supplies such as fertilizers should be opened and not just agricultural products, for example introducing the 'green channels' for transportation of fresh agricultural products. No roadblocks were imposed on fresh agriculture and its supply activity (Fan et al., 2021; Thapa Magar et al., 2021). In addition, the government should also subsidize agricultural supplies to farmers to reduce capital costs. This, in turn, might alleviate their stress and urge them to remain involved in the agriculture business.

Postharvest handling

Post-harvest handling affects the production of food products. The current global pandemic indirectly affects the agricultural activities of farmers in terms of work restrictions and lack of access to agricultural supplies, which affects crop production. Worst come to worst, if there is an increase in agricultural production but fewer buyers due to some restriction that came into force, this will lead to dumping of agricultural products and result in wastage. Therefore, post-harvest handling in this time of pandemic is essential in achieving resilience.

The use of agricultural machinery can increase the speed of operations thus can increase yield, lower production, and agricultural costs as well as reducing the post-harvest losses (UNESCAP, 2020). Besides, this effort can help to reduce the use of labor that has difficulty coming down to work due to pandemics. In other words, the use of agricultural machinery post-harvest can help in restoring the crisis and resilience of agriculture. In addition, the use of post-harvest mechanization can also improve the storage and processing efficiency of perishable agricultural products. For example, introducing a large capacity of decentralized cold storage will overcome the problem of disposal and wastage of unsaleable vegetables (Priyadarshini & Abhilash, 2021). This action will accommodate the storage of vegetables that have been harvested before reaching the consumer, thus maintaining the freshness of vegetables. The problem

of horticultural losses can also be addressed through mechanization with the use of food processing machines. Agricultural products that are unfit to be sold can be processed into value-added food products, which can increase the shelf life of the farming products before they reach the consumers.

Digitalized machinery usage can also enhance the efficiency and productivity of agriculture harvesting (Onishi et al., 2019). For example, the usage of Agri-Robotics (automated fruit harvesting robots) helps to save labor and increase agricultural yield. This at the same time helps in solving the problem of shortage of workers on the farm as a result of work restrictions.

Processing

Among the problems of processing in the food supply chain during this pandemic, is with the closure of factories which often occur due to the positive cases among workers. In addition, the rotation of work carried out in some places will cause work productivity and product production to decrease. This in turn can disrupt food production and reduce supply to consumers.

Human-Machine Collaboration is a way that can be done to reduce human interaction in the workplace. This collaboration involved the interaction of humans with a wide range of technology and gadgets. The diversity of available technologies that support monitoring systems or the automation of various systems makes it useful in the agri-food sector.

Another intervention that can be done is also by introducing the Machine-Machine Collaboration in the food processing industry. It is an autonomous system that functions in an agri-food production system such as robots and automated food processing machines that can perceive, decide, and act without the need for human interaction.

Besides, the 'sensing, smart and sustainable (S3)' concept can also be applied in the food manufacturer to achieve resilience across the food supply chain (Miranda et al., 2019). S3 technology is a system that works through sensing, smart technology, involves sustainable solutions, and has a physical composition that includes hardware (mechanical, electrical/electronic) and software components. This system also has a role in information processing through artificial intelligence control and algorithms that can make the food processing sector runs efficiently and productively regardless of any circumstances.

Distribution and consumption

Distribution problems also occur in the food chain, especially the process of transporting food from food processing centers to areas far from the city center. This is exacerbated during pandemics where logistical restrictions occur due to road restrictions. This affects the consumer in terms of accessibility and availability of food.

One of the ways that can be done to ensure that food reaches the customer is by

using distributed manufacturing. Distributed manufacturing is based on small-scale, decentralized production and its location close to the customer. This method has also been identified as an alternative method to centralized food production that is said to be effective and potential in producing a good food chain as well as can supply locally distribute food that is fresh and customized where food storage and distribution can be reduced (Almena et al., 2019).

The use of technology also helps in the process of distribution. Blockchain technology and an internet-based supply chain system can strengthen the relationship between sellers and buyers so that buying and selling processes take place (Barman et al., 2021). Features for

contactless transmission, which allows the courier to leave a message in the appropriate place for customer acquisition, without interaction from person to person is useful during this pandemic era. This simple and fast system is also user-friendly that easy to be used by the producer and consumer. This system needs to be extended and practiced also in the area that is far from producers without them having to commute to get food.

A public distribution system (PDS) is also suggested in this pandemic era. This system involved the management of scarcity through the distribution of food at the red zone or weaker places that effected by the pandemic at affordable prices (Barman et al., 2021). In this system, the involvement of state and central governments is important in controlling food prices as well as providing food subsidies to consumers. At the same time, food distribution can also be monitored through the use of this system until the food reaches the consumer.

In a conclusion, the closure of food manufacturing facilities, financial constraints, restriction of commercial activities, and the food products distribution due to the impact of COVID-19 makes us need to do something to fix this problem and at the same time strengthen the resiliency of the supply chain. Therefore, all the main actors involved need to work closely to revitalize the agricultural sector affected by the COVID-19 pandemic especially the government and also the specialists in the related field. They need to take action towards all the potential mitigations discussed earlier to improve resilience across the food supply chain starts from production until the consumers.

REFERENCES

Aday, S., & Aday, M. S. (2020). Impact of COVID-19 on the food supply chain. Food Quality and Safety, 4(4), 167– 180.

Almena, A., Lopez-Quiroga, E., Fryer, P. J., & Bakalis, S. (2019). Towards the decentralisation of food manufacture: effect of scale production on economics, carbon footprint and energy demand. Energy Procedia, 161, 182–189.

Barbosa, M. W. (2021). Uncovering research treams on agri-food supply chain management: A bibliometric study. Global Food Security, 28.

Barman, A., Das, R., & De, P. K. (2021). Impact of COVID-19 in food supply chain: Disruptions and recovery strategy. *Current Research in Behavioral Sciences*, *2*, 100017.

Fan, S., Teng, P., Chew, P., Smith, G., & Copeland, L. (2021). Food system resilience and COVID-19 – Lessons from the Asian experience. Global Food Security, 28.

FAO. (2018). The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition. FAO, Rome. http://www.fao. org/publications. (Accessed 19 September 2021).

International Monetary Fund (IMF), 2020. World Economic Outlook. June 2020. https:// www.imf.org/en/Publications/WEO/Issues/ 2020/06/24/WEOUpdateJune2020.

Kamrath, C., Wesana, J., Bröring, S., & De Steur, H. (2019). What Do We Know About Chain Actors' Evaluation of New Food Technologies? A Systematic Review of Consumer and Farmer Studies. Comprehensive Reviews in Food Science and Food Safety, 18(3), 798–816.

Knorr, D. & Augustin, M. A. (2021). From value chains to food webs: The quest for lasting food systems. Trends in Food Science & Technology, 110, 812-821

Marusak, A., Sadeghiamirshahidi, N., Caroline, C. K., Mittal, A., Beckwith, S., Cantu, J., Morris, M., Grimm, J. (2021). Resilient regional food supply chains and rethinking the way forward: Key takeaways from the COVID-19 pandemic. Agricultural Systems. 190, 103101.

Miranda, J., Ponce, P., Molina, A., & Wright, P. (2019). Sensing, smart and sustainable technologies for Agri-Food 4.0. Computers in Industry, 108, 21–36.

Onishi, Y., Yoshida, T., Kurita, H., Fukao, T., Arihara, H., & Iwai, A. (2019). An automated fruit harvesting robot by using deep learning. ROBOMECH Journal, 6(1), 2–9.

Panetto, H., Lezoche, M., Hernández, J.E., Diaz, M.D. & Kacprzyk, J. (2020). Special issue on Agri-Food 4.0 and digitalization in agriculture supply chains – New directions, challenges and application. Computers in Industry. 116, 103188.

Priyadarshini, P., & Abhilash, P. C. (2021). Agri food systems in India: Concerns and policy recommendations for building resilience in post-COVID-19 pandemic times. Global Food Security, 29.

Sales, T., Bonzom, P., Kgomotso, P. K., Muller, D., Berhanu, G, Mohamed Imam, B. & Asha, B. S. (2017). Options and opportunities to make food value chains more environmentally sustainable and resilient in Sub-Saharan Africa. UNDP

Sjah, T., & Zainuri, Z. (2020). Agricultural Supply Chain and Food Security (Issue January, pp. 79–88).

Thapa Magar, D. B., Pun, S., Pandit, R., & Rola Rubzen, M. F. (2021). Pathways for building resilience to COVID-19 pandemic and revitalizing the Nepalese agriculture sector. Agricultural Systems, 187.

UNESCAP. (2020). The role of sustainable mechanization in addressing the impact of the coronavirus disease on agriculture and in buidling resilience (Vol. 00753, Issue November).

Vijayalakshmi, P., Pradeepalakshmi, K., & Sowmiya, S. P. B. (2020). Prevention of Adulteration in Packed Foods Using Block Chain. International Research Journal of Engineering and Technology (IRJET), 07(05), 7570–7574.

Zhan, Y. & Chen, K. Z. (2021). Building resilient food system amidst COVID-19: Responses and lessons from China. Agricultural Systems. 190, 103102.

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Preparing Indonesia Agri-food Management in The New Normal Era

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Indonesia is a country that has abundant resources that can be seen from various sectors. From fishing to agriculture. As we know today, there are still outbreaks of viruses that are dangerous for humans. This virus has spread and damaged the normal way of life for human survival. Indonesia already has its own way of dealing with the COVID-19 pandemic, especially in the agricultural sector. Agriculture is very vital for human survival. The fulfillment of good and sufficient food availability is very important in the realization of a good food security for each individual. Food security becomes very vulnerable when dealing with natural disasters, including the disaster of a disease now known as the Covid-19 virus. Especially when the government responded to the outbreak by implementing the Large-Scale Social Restriction (PSBB) policy to reduce the spread of Covid-19. The decline in people's purchasing power was due to a decrease in people's income due to layoffs (Disconnections) and cuts in wages. As we can see that has been reported by the Food and Agriculture Organization (FAO), the International Food Policy Research Institute (IFPRI) and the United Nation (UN) it is said that the Covid-19 pandemic can cause a food crisis which will have an impact on a country's food security, especially poor countries and developing countries (Warta Ekonomi, 2020). The Covid 19 pandemic has caused disruptions to the global logistics system that has affected food access. For Indonesia and several other countries that have almost the same economic level or below, food access problems that arise are generally caused by low

incomes of the people. The number of people who have lost their jobs due to the Covid-19 pandemic can lead to a decline in food security so that people have to depend on assistance from the government. As in agriculture. The number of people who have lost their jobs due to the Covid-19 pandemic can lead to a decline in food security so that people have to depend on assistance from the government. As in agriculture. The number of people who have lost their jobs due to the Covid-19 pandemic can lead to a decline in food security so that people have to depend on assistance from the government. As in agriculture.

Agriculture is one sector that has great potential to be developed because it is the main buffer for the food sector. In addition, agricultural products are also suppliers of raw materials for most industrial sectors. It is said that the paradigm in agricultural development in the future is no longer through a farming approach but an agribusiness approach (Nasruddin et al., 2015). As a form of agricultural development with an agribusiness approach, it is necessary to change the way farmers think in managing their farming. The pattern of thinking in agricultural actors is no longer within the scope of subsistence agriculture but modern agriculture. This can be done by educating farmers about agripreneurship. Agripreneurship refers to entrepreneurship in agriculture (GFRAS, 2021). Rahmawati (2018) in Jazilah (2018) explains that agripreneurship is the application of innovative entrepreneurial activities in the agricultural industry. Based on data

from the Ministry of Agriculture, it is known that currently the number of Indonesian farmers reaches around 33.4 million people. The number of the older generation (91%) with ages approaching 50 years to 60 years. This older generation lacks the mastery of technology. Farmers who belong to the category of the younger generation are only about 9% or 2.7 million people. This young generation is between 19-39 years old (Farizi, 2020). The number of the older generation (91%) with ages approaching 50 years to 60 years. This older generation lacks the

mastery of technology. Farmers who belong to the category of the younger generation are only about 9% or 2.7 million people. This young generation is between 19-39 years old (Farizi, 2020). The number of the older generation (91%) with ages approaching 50 years to 60 years. This older generation lacks the mastery of technology. Farmers who belong to the category of the younger generation are only about 9% or 2.7 million people. This young generation is between 19-39 years old (Farizi, 2020).

In Indonesia, Agriculture plays a strategic role and is very important as a source of livelihood for the population (Nugrayasa, 2013). Where recorded in North Sumatra (BPS Sumut, 2020) and West Aceh (BPS Aceh Barat, 2020) have superior agricultural commodities, including

rice. Farmers have a tendency to keep working even though they have entered old age (elderly) (Govinda et al, 2018). One of the problems faced by elderly rice farmers is a high workload which leads to the ability of elderly farmers to carry out all activities in rice farming carefully (Sarah et al., 2019). According to Eldo et al (2018), farming includes the seeding process, planting, maintenance, irrigation, weeding, fertilization, pruning, pest and disease control, harvest and post-harvest. Unbalanced work demands with the capacity and health status of farmers, especially elderly rice farmers as individuals who are vulnerable to workload (Intani, 2013), stress and illness (Srinita, 2018), supported by the arrival of the Covid 19 pandemic to enter the New Era. Today's normal affects the lives of our farmers. Rice cultivation if using pesticides will put farmers at risk of diseases that can threaten health (Govinda et al., 2018). This can cause great stress and affect the quality of life of elderly farmers. supported by the arrival of the Covid 19 pandemic to enter the New Normal era currently affecting the lives of our farmers. Rice cultivation if using pesticides will put farmers at risk of diseases that can threaten health (Govinda et al., 2018). This can cause great stress and affect the quality of life of elderly farmers. supported by the arrival of the Covid 19 pandemic to enter the New Normal era currently affecting the lives of

our farmers. Rice cultivation if using pesticides will put farmers at risk of diseases that can threaten health (Govinda et al., 2018). This can cause great stress and affect the quality of life of elderly farmers.

According to (Hariyadi, 2010) There are several aspects in the process so that food security can run well, namely;

1. Aspects of food availability include: adequacy of quantity (quantity), adequacy of quality, adequacy of nutrition and safety
2. Aspects of food affordability, including: physical, economic, and social affordability then conformity with preferences, conformity with habits and culture and conformity with beliefs.
3. Aspects of food consumption, including: adequacy of intake, quality of food processing, quality of sanitation and hygiene, quality of water and quality of child care.
4. Aspects of food independence, including: the level of diversity of local food resources, the level of dependence on food imports, and the level of dependence on imports of food production facilities (seeds, fertilizers, packaging, machinery, etc.)
5. As well as sustainability aspects, including: sustainability of availability, sustainability of affordability, and sustainability of consumption.

On the other hand, local food or traditional food can act as a survival strategy for the economically weak community in the food security system. Traditional food patterns can be a complement to staple foods other than rice, the use of local ingredients which are usually more secure in their availability as staple foods that are cheap and accessible to the local community, have an impact on increasing household income (Puji Lestari, A, S, et al, 2007). The following is a description of local food technology innovations with an emphasis on aspects of consumer preferences, namely: Quality Nutrition, Local Foo, Food Technology, Food Security, Security Consumer Preference.

So, Indonesia has a very abundant potential for local food availability. However, to date, its contribution in supporting food security is still very low, especially with the Covid-19 virus outbreak. This is due to the lack of approach to local farmers and technological innovations for these local food products so that the resulting products have not been able to attract the interest of food consumers in Indonesia. Therefore, extension and technological innovation of local food products absolutely must be done. Counseling to every farmer must be carried out so that farmers get better knowledge and insight, especially during the current pandemic and with technological innovations for local food, not only on aspects of quality, nutrition, and safety, but what is no less important is that technological innovation for food products must also touch the aspect of consumer preferences. Especially in the field of food diversity, food technology is expected to play a role in increasing the added value of local food products. So that the resulting local food products attract consumer interest. Meanwhile, innovation in local food products, an equally important factor is the role of local governments in supporting and advancing local food products. Where the government must always be transparent and prosper every farmer and every export and import need for agricultural processing during the current pandemic. So that farmers can be more enthusiastic because their business is more secure for their future.

REFERENCES

BPS Aceh Barat, 2020, Aceh Barat in Figures 2020, Accessed from https:// acehbaratkab. bps.go.id/, accessed on 20 June 2020.

BPS North Sumatra, 2020, North Sumatra in Figures 2020, Accessed from https://sumut.bps.go.id, accessed on June 24, 2020.

Eldo Ryan, Tinjung Mary Prihtanti, Hendrik Johannes Nadapdap, 2018, Factors Influencing Farmers' Adoption of the Implementation of the Jajar Legowo Agricultural System in Barukan Village, Tengaran

District, Semarang Regency. Proceedings of the National Seminar on the Context of the 42nd UNS Anniversary 2018 "The Role of Biodiversity to Support Indonesia as the World's Food Barn" Vol. 2, No.1.53-64

Farizi, R. Al. (2020). Young Farmers Eroded, Dominant Old Farmers Without Technology. April 13, 2020. Accessed from https://fajar.co.id/2020/04/13/petanimuda-tergerus-dominan-petani-tua without-technology/

Govinda Bhandaria, Kishor Atreya, Xiaomei Yanga, Liangxin Fane Violette Geissen, 2018, Factors affecting pesticide safety behaviour: The perceptions of Nepalese farmers and retailers. J. Science of Total Environment, vol. , 631-632, 1560-1571.

GFRAS. (2021). The Role of RAS for Inclusive Agripreneurship Background and Rationale. Joomla Experts. Accessed from https://www.gfras.org/en/agripreneurship.html

Hariyadi, P. 2010. Realizing Food Safety for Regional Superior Products.

Intani, AC, 2013, Relationship between Workload and Stress in Elderly Farmers in Rice Farmer Groups, Sukowono District, Jember Regency, University of Jember Thesis, Unpublished. This is a solution to the threat of food security during the Covid-19 pandemic (kontan.co.id)

Jazilah, Syakiroh. (2018). Agripreneurship in the Industrial Revolution Era 4.0. 150–154. Accessed fromhttps://proceeding.unikal.ac.id/index.php/j ob/article/view/185

Nasruddin, W., Junaidi, E., Musyadar, A., & Dayat, D. (2015). Entrepreneurship Level of Various Agribusiness Actors in the Bogor Region. Indonesian Journal of Agribusiness, 3(1), 55– 66. Accessed fromhttps://doi.org/10.29244/jai.2015.3.1.54- 66

Puji Lestari, A, S., Maksum, M., Widodo, KH 2007. The Role of Traditional Food Made from Cassava in the Food Security System in Review from a Household Economic Perspective. Journal of AGRITECH, vol.27, No.1, March, 2007.

Srinita, 2018. "Factors affecting the food security and community welfare of farmer households in Sumatra, Indonesia", World Journal of Science, Technology and Sustainable Development, Vol. 15 No. 2, pp. 200 - 212. https://doi.org/10.1108/WJST SD -10 -2017 -0037

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Pandemic Covid-19: Impacts and Measures Adopted by Food Agriculture Industry

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The COVID-19 pandemic that occurred in all parts of the world greatly affected almost all sectors, including the agri-food industry which is one of the vital sectors for human survival. Restrictions on the mobilization of human movement have been implemented in almost all regions of the world since March 2020 until now to reduce the number of cases of the spread of COVID-19. Restrictions on movement space and temporary closure of public spaces make people required to stay at home until the situation is judged to allow them to be able to do activities outside the home, except for essential sector workers and to get medical treatment in hospitals or clinics. In fact, this limitation of mobilization has an impact on shopping centers that apply operational hours and limit customer quotas. This situation raises serious problems, including a lack of food supply, and limited distribution of food ingredients to the end consumers. As a result, the virus's containment measures are beginning to disrupt the supply of agro-food products to markets and consumers, both within and across borders. To overcome this crisis, the food agriculture industry tends to be quick on the development and improvement of technology and innovation to build its resilience in the face of a range of challenges in pandemic era.

Food is like bread and butter; either eat food for live or live to eat food, food is a basic thing that we need to survive. Year 2020 was a severe test field for all countries in the world. In Malaysia for example, farmers and mostly rural gardeners' community in Malaysia were unable to sell their crops, therefore dumping of crops increased and supermarket in town facing the reduction of agro-based food suppliers. Hence, Malaysia plans foremost efforts to overcome the shortage food supply and the surge of agriculture crops in hinterland area. Latest economic stimulus package has been introduced by Malaysia's government which known as Pemerkasa Plus. This initiative was implanted as a response to the national lockdown measures. To strengthening agriculture industry, there are key initiatives implemented in the agriculture and food industry sector. Firstly, RM 30 million is for expansion of community farming program, RM50 million for implantation of organic agriculture, while RM 10 million for e-Satellite project, RM60 million for Agromood value chain modernization program and RM 100 million for implementation of impact and high value agriculture and livestock project. Food security in Malaysia has received considerable attention over the years. During this pandemic era, Malaysia also will not be compromised to ensure the food availability which sufficient in quantities and appropriate quality, physically food access, utilization food safety and stability to have adequate food all the time. Therefore, in Malaysia the Ministry of Agriculture (MOA) and other agencies had proposed assorted initiatives as to improve and facilitate the food supply chain. Firstly, MOA emphasize the food storage and distribution facilities. Food supply chain was disturbed not only for the small stakeholder but also affect the major stakeholder. Interestingly, RM 10 million has been channeled to Federal Agricultural Marketing Authority as to continuation and maintain the food storage facilities. As a result, this initiative improves the storage capacity of the food stock. In addition, dumping of crops were able to be reduced and scale down the urge in food supply.

That aside, the MOA has created a Controlled Fresh Market (CFM) stall. The CFM was established to address the disruption of the agricultural supply chain from local farmers and public markets. This method has a good impact on the problem of farmers who have a surplus of agricultural produce. Universiti Malaysia Sabah has also taken steps to help farmers, especially in rural areas, to sell and market their crops. The latest innovation from Universiti Malaysia Sabah led by Dr Jurry Foo has produced cabbage as a food that has been valued for a long time through the production of cabbage floss. This initiative successfully helped reduce losses in the cabbage vegetable market and avoided wastage of cabbage vegetable dumping.

The spread of Covid-19 virus easily occurs when there is social interaction between humans who have covid-19 symptoms. Therefore, Malaysia has enforced movement control (MCO). The MOA took a step forward by providing an e-marketplace platform to create digital relationships that facilitate the sale or purchase of food. The *E-Rezeki* program introduced by the Malaysia Digital Economy Corporation (MDEC) was also adapted by the MOA in food delivery services. In addition, the initiative implemented by the MOA is to expand the market value of agricultural products not only focused on the domestic market but also to the international market through collaboration with external agencies such as Ourshop Airasia because this e-commerce marketplace has capable of replacing old market methods such as in-store sales or markets which currently limited due to the pandemic outbreak.

Furthermore, MOA also implemented measure to encourage young people to become local entrepreneurs by following the agricultural sector programs provided by the Minister of Agriculture and Food Industry (MAFI) such as the Young Agropreneur Program, Agricultural Training Program and My Future Agro Program where this program provides opportunities for youths to be involved in agro-food industry

and especially in the agricultural industry. The involvement of these young people can be a catalyst in the sustainability of food production in the country, guaranteed food security and the production of new technologies to increase agricultural yields in the country.

Indonesia on the other hand, introduced digitalizing system, in which consumers who feel they don't really need to shop directly at offline stores, are looking for other ways to reach products, one of which is by ordering through e-commerce or shopping online. A cashless society and technological innovations are becoming increasingly popular around the world whether using cards or electronics which are used much more intensively in several countries such as the Netherlands, Germany, and countries in Scandinavia which grew by 14% during 2018-2019. Countries can provide convenience access to financial services for the public to absorb non-cash payment solutions by technology for traders and macroeconomics, especially the issue of COVID-19 transmission through cash and physical meetings during transaction activities between sellers and buyers, so that purchases of agri-food products which are the primary needs of the community are increasingly attracting public attention to shop through online platforms with cashless payment methods. Other than that, consumers can determine what items to buy through a platform and see how many shopping carts they have. Consumers can also delete (put back) products that are not purchased if they are not considered a priority. In addition, through e-commerce, consumers can pay through the merchant gateway system which is available in cash or non-cash for cashless and the transaction evidence that is inputted and sent via e-mail can be a record of the next shopping. Furthermore, through the scheduled and selected time, the consumer's groceries will be sent by courier directly to the consumer's address with a safe health protocol. Of course, consumers don't need to clean themselves again like they usually do when they come home from offline stores, they just need to spray disinfectant or ultra-light to kill viruses and bacteria on their groceries for a few minutes before consuming the product. Agri-

food product delivery platforms must also ensure that products are delivered safely from viruses, so cleaning and sanitizing vehicles or bags used to move food from point of origin to location should be a priority by disinfecting delivery vehicles so that consumers can demonstrate appropriate food safety practices. can be satisfactorily accepted, resulting in a safer food supply chain.

Utilizing industry 4.0 and adopting digital technology is the ideal time during the current COVID-19 pandemic, although agribusiness companies must be maneuver from conventional services to digital technology, the sales results that will be received will also be paid off. By mastering digital marketing, agribusiness companies will be increasingly recognized and can attract consumers more broadly. The use of robotic systems and digitalization which is a solution for companies to exist and survive, it turns out that there are millions of employees who are converted due to the impact of technology which will further endanger lives, threaten food and nutritional needs for low-income and marginalized workers. Farming/agribusiness turned out to be in contact with other fields during the COVID-19 pandemic crisis, with the application of digitalization in agribusiness, of course converting many employees who are not only employees of downstream businesses, but suppliers, small-scale farmers, communities who depend on agricultural products, and labor of export-import work.

All of changes will have pros and cons, digital technology can have a positive impact on a generation that understands the opportunities in the technology, but on the other hand, there is a generation that relies on agriculture in conventional ways from the farming process to its sale, they do not understand and do not get access to the world of digitization. This is our collective work on how we can help the entire agricultural supply chain from upstream to downstream without sacrificing conventional farm workers. With global support and solidarity and other research devoted to agribusiness in developing countries, of course, the hope

of this long-term humanitarian disaster and food security disaster will not happen. There is still a lot that needs to be highlighted and further analysis in writing this article which is useful for all farming business actors.

In China, covid-19 affect the poor circulation and sales of agricultural products industry chain, mismatch of supply and demand in meat, egg and milk production and marketing areas. In addition, insufficient supply of spring farming agricultural materials, broken agricultural small and micro-enterprises capital chain, increased difficulty for migrant workers to work, and blocked agricultural exports also affected because of this pandemic. On the whole, the impact of the new crown pandemic on non-agricultural employment is greater than agricultural employment, rural service industries greater than agricultural production, breeding industries greater impact than planting industries, and fruit and vegetable planting greater than food planting. The overall situation, the particularity of fruits, vegetables, livestock and poultry and agricultural products, has special requirements for the quality of storage and preservation, and the limited logistics has caused serious out-of-files in the production and sales links, and the supply of agricultural materials is in place. As a result, fruit and vegetable cultivation and livestock and poultry industries suffer more severely than other agricultural industries. The impact of the pandemic on circulation has undergone a series of chain reactions, causing problems such as the break of the industrial chain and the structural disconnection of supply and demand.

Currently, there is no reason for the health crisis to develop into a global food crisis. Supplies of staple crops are large, production prospects are favourable, and cereal stocks are expected to reach their third highest level on record. Moreover, most countries have designated the agriculture and agro-food sector as essential and exempt from business closure and restrictions on movement. For many countries, the direct impacts of the pandemic on primary agriculture should be limited, as

the disease does not affect the natural resources upon which production is based. However, the virus poses a serious threat to food security and livelihoods in the poorest countries, where agricultural production systems are more labour-intensive and there is less capacity to withstand a severe macroeconomic shock.

Because food is a basic necessity, the level of food demand should be affected less by the crisis than the demand for other goods and services. However, there has been a major shift in the structure of demand, with a collapse in demand from restaurants, hotels and catering, the closure of open markets, and a surge in demand from supermarkets. There are signs that businesses along the food chain are already adapting to shifts in demand, for example by switching production lines and increasing their capacity to manage larger inventories; moving to on-line platforms and direct delivery to households; and hiring temporary staff. In all but the poorest countries, the biggest challenges for the sector come from the measures needed to contain COVID-19; the necessary adjustments within the sector to comply with those measures (which may increase costs); and the need to find alternative markets for products affected as people change their consumption habits in response to COVID-19. The government ensure that facilities and assistance on all food lines, from production to consumption, run as they should. Therefore, the government optimize the potential of domestic food production and improve the national food logistics system.

To ensure the sustainability of food production in the country, all parties must work together to address this problem without pointing fingers at each other. As the younger generation, the responsibility to develop and modernize the agro-food industry in this country must be taken seriously from now on because we are the inheritors of the country and the leader of the country's pattern in the future. Future success is determined by diligent efforts starting from now.

REFERENCES

Foo, Jurry. (2020). Pengawetan Sayuran Dengan Mengoptimumkan Kearifan Tempatan Boleh Menyelamatkan Lambakan Sayuran Dalam Tempoh Pkp Menghadapi Penularan Covid19 di Sabah -.

Golam Hassan, Asan Ali & Ngah, Ibrahim & Applanaidu, Shri Dewi. (2018). Agricultural Transformation In Malaysia: The Role Of Smallholders And Area Development.

https://documents1.worldbank.org/curated/en/617611574179512389/pdf/Agricultural-Transformation-and-Inclusive-Growth-The-Malaysian-Experience.pdf

https://belanjawan2021.treasury.gov.my/index.php/ms/galeri/infografik-pemerkasaplus-2021

http://belanjawan2021.treasury.gov.my/pdf/speech/2021/rub-2021-en.pdf

Raguindin, Mark Limon. 2020. Food Safety Practice Of Food Handlers At Home Engaged In Online Food Businesses During COVID-19 Pandemic In The Philippines.

Rahman, Mahfuzur, Izlin Ismail, Shamsul Bahri. 2020. Analysing Consumer Adopotion of Cashless Payment In Malaysia.

Shamsudin, Rosnah & Vincent, Christine. (2020). Agricultural and Food Industries in Malaysia. Advances in Agricultural and Food Research Journal. 1. 10.36877/aafrj.a0000107.

Rahman, Z.A (2012). Agricultural research and development in Malaysia. 18. 22-33.

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Quality Management in Food Chains During Pandemic Covid-19

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Pandemics are existent way before what we are currently undergoing. History tells us that regardless of the pandemic, it has always had severe negative impacts on the economy. The COVID-19 pandemic has obstructed the socioeconomic status of countries worldwide, influencing every sector of society. Along with its decline, there is a fall in resource prices, which significantly influences people's economic and social life, especially those in vulnerable groups. Hence, prompt responses are required to minimize the adverse effects of the pandemic and recover instantly, including in the aspect of sustainable agriculture transformation. The effects are drastic; thus, the immediacy of responses is crucial to keep the economy afloat and cater to people's needs.

In connection to that, the pandemic has impaired one of the most critical sectors, agriculture. When the agriculture-related processes slowed down, from smallholder farmers to agricultural industries, problems in harvest and other food-related necessities were affected (Assaubayeva & Yi, 2020). Respectively, there are also challenges in both supply and demand stocks of individual families and food chains. There is excess supply due to movement restrictions. There are also difficulties in the accumulation of fertilizers, machinery spare, and harvest levels. Hence, these concerns must be addressed to avoid much more significant complications soon.

Given the situation above, the current focal problem is quality management in the food chains. The COVID-19 has pushed people to opt for safety choices such as food deliveries as replacements for dine-ins in stores and restaurants. Due to that, food chains had to adjust and consider the situation in terms of maintaining both their food and services. At present, there is considerable concern about food production, processing, demand, and distribution. There are, again, restrictions in the parts of the consumers and food chain facilities, respectively.

Consequently, to respond to this effect, the government must facilitate the movement of workers and agri-food products. Besides, there should be a change in working conditions of workers to retain the safety of the workers, in consideration of the risks accompanied by working amid the pandemic. In addition, food protectionists must see to it that food prices are controlled and maintained despite the changes.

Some of the most influential stakeholders in this matter are the farmers and their agents, agricultural suppliers and services, food distributors and processors, national/regional health protection agencies, and NGOs. Farmers and their agents are responsible for growing crops and taking responsibility for the process; agricultural suppliers are responsible for the supply of seeds, pesticides, fertilizers, and the like; food distributors and processors for the wholesale and retail of crops; national/regional health protection agencies for the risk management and regulation; and NGOs for the risk communication. Their role in the agricultural process is essential, from growing crops to making sure they are safely delivered to food chains. It is then the food chain's responsibility to ensure that raw materials are purchased from organic farmlands that follow safety measures to avoid possible health problems (Identify key stakeholders: Agriculture, n.d.).

As an individual who also experienced the onslaught of the pandemic, I understand that there are risks everywhere. The usual dinner dates restaurants are now dinner dates at home, with food delivered at the doorstep. The new normal may be far from usual; however, it is for the safety of everybody, which means we have to opt for safe choices, including our choices in food. In the part of the food chain, while they are also severely affected by the pandemic, quality management should still be instilled to ensure safety for both parties.

REFERENCES:

Assaubayeva, D., & Yi, P. W. B. (2020, May 11). *Responses to COVID-19 for sustainable agriculture transformation*. Retrieved from https://www.unescap.org/blog/responses-covid-19-sustainable-agriculture-transformation#.

Defining the stakeholders: an example from agriculture | Integrated Environmental Health Impact Assessment System. (n.d.). Integrated Environmental Health Impact Assessment System. Retrieved September 9, 2021, from http://www.integrated-assessment.eu/eu/guidebook/defining_stakeholders_example_agriculture.html

Identify key stakeholders: agriculture. (n.d.). Supply Chain Solutions Center. Retrieved September 9, 2021, from https://supplychain.edf.org/resources/identify-stakeholders-agriculture/

Inclusion of smallholder farmers and collaboration system

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Intensifying Kadiwa Ni Ani at Kita in Restoring Agriculture Value Chain in The Philippines During COVID-19

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Despite being the primary producers and the main source of agricultural food supplies in the market, farmers get the least benefit and earn the least from the actors in the chain. Due to a lack of capacity or financing to use farming practices and technology, farmers are sometimes unaware of how to sell their products at a reasonable price. As such, they usually sell it to middlemen at a lower expected price, while these middlemen benefit largely from them through selling their products at a higher price in the market. The food supply chain, also referred to as "farm to table" is a complicated web of relationships between farmers, manufacturers, distributors, retailers, and consumers. Therefore, this requires it to be fast and smooth to ensure that agricultural products are brought to its consumers, without rotting. Moreover, it ensures that all actors in the chain are benefiting. However, with the COVID-19 taking place, the supply and demand chain is further hampered by farm-to-market infrastructure through its quarantine measures and restrictions. In this, the supply chain has limited the Philippines' ability to provide food security and increase the international competitiveness of its agricultural goods.

On April 2020, tougher limitations were adopted in Quezon province, allowing residents in some areas to leave their homes only once a week, putting the crop at risk of spoilage during the dry season (Rey, 2021). Despite the national government's policy to maintain the agricultural

work unhampered, farmers are told to stay at home. Limited mobility and closing of borders had also impeded logistics of transferring agricultural goods from one place to another, disrupting farm and business operations. As a result, various agricultural products came to waste and a shortage of products is seen in the market, which in turn spiked prices for consumers and losses for farmers. PwC (2020) outlines the agri-food system disruptions that occurred during the pandemic, including: labor shortages, particularly in countries that rely heavily on migrant workers; delays in cargo transport; and a lack of workers in ports, which resulted in backlogs in moving out containers, including those used to dredge the seas. Thus, COVID-19 affected both producers and consumers, disrupting both sides of the demand and supply chain.

Added to the struggles of farmers and producers is the existence of the Philippines' rice liberalization law. This calls for the elimination of price and market regulations, the removal of limitations in imports, the reduction of government intervention, and the privatization of services. While the goal is to improve the quality of agricultural services and the lives of regular farmers, the impact on the local farmers' lives indicates otherwise. Due to the influx of rice imports, this regulation has driven down the price of locally grown grains, exacerbating the region's farmers' hardships (Conde, 2020). Specifically, for the Bicol region, this has "served like a death sentence for 75% of the farmers," according to Kilusang Magbubukid sa Bicol (KMB), a farmers' group (Conde, 2020). With the price of locally grown agricultural products going down and the losses brought by spoilage, local farmers are driven more into poverty.

As the food security during COVID-19 is a national issue, thisi requires the immediate action, response, and cooperation of the national government, Local Government Units (LGUs) such as the Department of Agriculture (DA), producers, middlemen, and consumers. One of the government's efforts in fixing the agri-food of the Philippines is *Kadiwa ni Ani at Kita.* Launched in 2019, this aimed at directly connecting small

farmers with consumers by cooperating with local government units to establish market terminals near residential or public places (CNN Philippines, 2021). This also comprises rolling stores in vehicles that deliver fresh agri-fishery items to barangays and villages, as well as a digital marketing platform that allows clients to order products online. In this, the Department of Agriculture locates providers of agri-fishery products from provinces and supports their distribution to families in Local Government Units. The Department of Agriculture requires partner suppliers to sign a contract to engage in selling activities in areas and times facilitated by Local Government Units, to ensure safety and quality of food, to maintain retail prices 20% below the government-prescribed suggested retail price (SRP), to freeze or maintain prevailing market prices, while at the same time, following protocols. It is also through this that farmers get to sell their products directly to buyers. In this way, farmers can earn bigger than they usually can than going through a middleman. Additionally, consumers can also enjoy cheaper prices of goods, while enjoying fresh agricultural goods as this is directly from our armers.

Therefore, it is important to intensify this program especially amidst COVID-19 where there is limited mobility for consumers and where consumers need cheaper food in order to survive, and where farmers are suffering more and more into poverty. Intensifying this program would allow us to help more farmers and consumers that are suffering in this pandemic. This can prevent spoilage and backlogs that became one of the major issues of the agri-food sector during the COVID-19 pandemic as this directly from our primary producers. Through the cooperation of the national government, various local government units, barangays and homeowners' associations, and private institutions, thousands of farmers and consumers can benefit from the agri-food sector. As such, bringing *Kadiwa ni Ani at Kita* to more communities and reaching out to more farmers may be the solution for disruption in the value chain in agriculture, ensuring the link between production and the market, and ensuring that farmers get the right price for their products.

REFERENCES:

CNN Philippines (2021). DA strengthens 'Kadiwa NI Ani at kita' activities to Help farmers, fisherfolk. cnn. Retrieved September 9, 2021, from https://cnnphilippines.com/news/2021/6/24/Kadiwa-ni-Ani-at-Kita-Department-of-Agriculture.html.

Conde M. (2020, May 08). For Philippine farmers reeling from disasters, lockdown is another pain point. Retrieved September 10, 2021, fromhttps://news.mongabay.com/2020/05/for-philippine-farmers-reeling-from-disasters-lockdown-is-another-pain-point/.

Pushes farmers, Fisherfolk into deeper poverty. Retrieved September 10, 2021, from https://www.rappler.com/newsbreak/in-depth/coronavirus-lockdown-farmers-fisherfolk-poverty

PwC (2020). Maintaining food resiliency in a time of uncertainty: understanding the importance of food value chains in ASEAN and how to ensure their resilience to the COVID-19 crisis. Report Commissioned by Food Industry Asia. In: Price Waterhouse Coopers Advisory Services [online].

Rey, A. (2020, October 28). FOOD security FRONTLINERS: CORONAVIRUS lockdown.

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An Intersectional Approach To Smallholder Farmer Inclusion

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The international community's efforts aimed at combating hunger and malnutrition have led to the diminishing number of people in hunger globally (Edwards *et al.* 2021). Despite the decline, however, numbers remain large: in 2019, almost 700 million people suffered from hunger and malnutrition, and regrettably, these numbers increased due to the COVID-19 pandemic (Edwards *et al.* 2021). Around 135 million people, on the other hand, faced food insecurity in the year 2020 and the COVID-19 pandemic aggravated the already dire situation as it brought an additional 135 million people to the brink of famine (Edwards *et al.* 2021). According to the United Nations, 80% of the world's poor reside in the rural areas and work within the agriculture sector, at the same time, 80% of the world's food supply comes from the smallholder farmers that are considered to be a fraction of the 80% of the people below the extreme poverty line (*UNGA* 2017). These smallholder farmers, as defined by the World Food Programme (WFP) and the Food and Agricultural Organization of the United Nations (FAO), possess less

than one hectare of land to 10 hectares, mainly focusing on small-scale farming, making a livelihood as pastoralists, forest keepers, or fishermen (Edwards *et al.* 2021).

Many smallholder farmers lack access to official marketplaces, which would allow them to sell their produce and advertise prices where, as a result, the farmers fail to secure enough income (Anbarci 2013). Furthermore, most smallholder farmers confront a variety of other problems, such as poor logistics, market infrastructure, and security hazards which limit farmers' opportunities for merchandise, this relates to unavailability of storage for goods that causes prices to plunge, and damage to livelihood caused by climate change (Edwards *et al.* 2021).

It is a fact that agrifood products are perishable and require extensive logistical care (Perdana *et al.* 2020). This concern is much more prominent for smallholder farmers without official marketplaces who opt to sell to middlemen to enter the market and therefore go through longer supply chain processes. This means that more food can rot before reaching customers, and prices rise significantly. Higher prices and lower incomes will reduce the quality of food for consumers and the quantity of demand for the farmers (World Bank 2021). This condition also has implications for the availability of food for customers and the financial success of farmers. Such was the case during the onset of the pandemic where farmers experienced a higher level of losses because of the longer supply chain.

With these issues, the 2.5 billion individuals that are dependent on this particular agricultural industry become extremely vulnerable not only due to job insecurity, but food insecurity as well (Edwards *et al.* 2021).

In addressing this problem, there are various stakeholders that need to take action: first, the ministries of agriculture who are mostly responsible for the stimulation of agricultural growth within their jurisdiction

via the implementation of policy frameworks, public investments, and support programs for domestic and export-oriented commercial businesses; second, the other UN agencies, such as the Food and Agriculture Organization, the United Nations Environment Programme, the United Nations Industrial Development Organization, and the United Nations Development Programme, whose main goals would be to promote sustainable production and consumption of goods, as well as development financing; third, farmers associations who should push for the establishment of official marketplaces, logistical frameworks, and the like; fourth, universities and other academic institutions should take part in pursuing research for innovating farming practices for sustainable and cheaper practices so that farmers would be able to yield more crops and other produce in shorter amount of time in a sustainable manner; and lastly, trade unions must secure the trade of goods and services for the farmers and protect their businesses from the issues that impede on farmers' profitable market engagement (FAO Pesticide Disposal Series 2001).

With the identified stakeholders above, it is highly recommended to take an intersectional approach in providing smallholder farmers the agricultural support they need to become included in official marketplaces, especially in the pandemic. First and foremost, it is important to identify the basic needs of farmers in terms of equipment and logistical support from the production process to merchandising. To face these problems, the agrifood industry in Indonesia needs a system that can control the price and improve the effectiveness of supply chain (Rozaki 2020). With Regional Food Hubs (RFHs), the agri-food industry can be more sustainable. In general, RFHs manage products from local farmers from the collection process until they reach customers. In the process, RFHs work by connecting with local communities, selling to broader markets outside the region, sharing information among value chain partners, establishing standards of operation and products, negotiating prices, and many more (Winarno *et al.* 2020a). The ministries and the national

government should establish a formal market for the farmers that would establish the farmers as independent firms while introducing linkages between farmers and other private local and international firms for possible trade.

Utilizing technology, especially the online platform would be of paramount importance during the pandemic. The government must provide subsidies to farmers in cooperation with local trade unions for a needs-based assessment of the farmers' needs, be it in the form of loans, workshops for using online platforms, provision of necessary equipment, etc.

Furthermore, the universities and other academic institutions, along with the government ministries should look for alternative, cheaper, and more sustainable approaches to farming that have little to no negative environmental impacts that would benefit the smallholder farmers, especially.

Lastly, the UN agencies, as international institutions, should spearhead setting international standards and norms for smallholder inclusion by initiating discourse and disseminating information that could promote equal opportunities for smallholder farmers, much like other small-medium enterprises.

The agricultural industry is an important aspect of society. With our dependence on this industry for worldwide food systems, agricultural countries should give a special focus on how to maintaining food security and providing jobs for a significant portion of its people. With the solutions provided above, all the crucial links for creating a resilient and sustainable agri-food industry can meet, and work together to prevent food insecurity while maintaining the welfare of farmers.

REFERENCES:

Anbarci, N., Gomis-Porqueras, P., & Pivato, M. (2013). *Formal and Informal Markets: A Strategic and Dynamic Perspective* (No. 2013_6). Deakin University, Faculty of Business and Law, School of Accounting, Economics and Finance.

FAO Pesticide Disposal Series (2001). Food and Agriculture Organization of the United Nations. Rome, 28, 237-282.

Perdana T, Chaerani D, Achmad ALH, Hermiatin FR. 2020. Scenarios for handling the impact of COVID-19 based on food supply network through regional food hubs under uncertainty. Heliyon. 6(10):e05128. doi:10.1016/j.heliyon.2020.e05128.

Rozaki Z. 2020. COVID-19, Agriculture, and Food Security in Indonesia. Rev Agric Sci. 8:243–260. doi:10.7831/RAS.8.0_243.

The World Bank. 2021 Agu 17. Food Security and COVID-19. Brief., siap terbit. [diakses 2021 Agu 19]. https://www.worldbank.org/en/topic/agriculture/brief/food-security-and- covid-19.

United Nations General Assembly (UNGA). (2017). United Nations Decade of Family Farming (2019–2028). Resolution adopted by the General Assembly on 20 December 2017 A. RES/72/239. undocs. org. Retrieved from https://undocs. org/A/RES/72/239.

Winarno H, Perdana T, Handayati Y, Purnomo D. 2020a. Food hubs and short food supply chain, efforts to realize regional food distribution center (Case study on the establishment of a food distribution center in Banten province, Indonesia). Int J Supply Chain Manag. 9(3):338–350.

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Financial Inclusion of Smallholder Farmers in Indonesia: Young People and Digitalization as The Keys in Building Agricultural

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The Covid-19 seems to be a neverending pandemic thing since the government confirmed the spread of the Covid-19 virus on March 2, 2020. Not only has an impact on public health, but the Covid-19 pandemic also has a social life impact and the national economic impact as a result of the government policies. Based on year-on-year indicators recorded by the Central Statistics Agency (BPS), Indonesia experienced an economic contraction for four consecutive quarters. In the second quarter of 2020, the Indonesian economy contracted by 5.3% (YoY). However, after several quarters, Indonesia finally managed to get out of recession, the economic growth in Indonesia reachs 7.07% (YoY) in the second quarter of 2021. In addition, Indonesia's economic growth quarterly (q-to-q) gain 3.31% in April-June 2021. While accumulatively, Indonesia's economic growth was 3.1% (c-to c) in the first semester of 2021.

Indonesia's positive economic growth in the second quarter of 2021 raises hopes that the national economy will soon improve. Therefore,

national economy activities that are essential and have potential should pay more attention, including the economic activity in the agricultural sector. When some other sectors fell, the agricultural sector became the savior of the national economy during the Covid-19 pandemic. Based on data from the Central Statistics Agency (BPS), there are export achievements and increased production in the agricultural sector during the Covid-19 pandemic. From 2019-2021 agricultural exports grew by 14.3 percent with the food crop sub-sector as the main supporter in distribution and economic growth, which was 10.47%. It shows that the development of the agricultural sector is an opportunity to build the national economy. Agricultural can continuously develop through the industrial revolution 4.0 and digital agriculture.

In order to boost agricultural exports, food production capacity must be increased. So, the development of farming is something essentials which should be given more attention. To increase production yields, it is necessary to apply agricultural technology and innovation. With modern industrial technology and digital system, the agricultural sector can improve production yields to the maximum capacity by effective production and efficient production cost. To innovate and use modern industrial technology and digital system, farmers require a big capital.

But until now, smallholder farmers in Indonesia still often experience difficulties to gain capital access for their business. The 2016 National Socio-Economic Survey (Susenas) reported that only 15 percent of a sample of 8,000 farmers had access to bank credit. While 52 percent rely on their own capital, cooperatives, relatives, and other non-bank financial institutions. The problem is, relatively small lands and sometimes without certificates make it difficult for Indonesian smallholder farmers to gain capital access to formal financial institutions. Smallholder farmers prefer to borrow money from moneylenders because the procedures are practical and faster. However, beyond the advantages, moneylenders often make farmers suffered losses even give up their land taken by the moneylenders. It is because they can't pay debts and high interest to moneylenders due to crop failure or other unexpected expenses.

Smallholder farmers in Indonesia still have low access to financial institutions. Banks do not want to take risks by providing capital to farmers without collateral. On the other hand, many farmers are reluctant to deal with financial institutions because of complicated administrative requirements such as collateral issues and land ownership certificates. Even though the government of Indonesia has already provided Farmer Business Credit (KUT) and People's Business Credit (KUR) with low interest so that smallholder farmers in Indonesia can gain capital access easier, KUR and KUT have not been used properly by the smallholder farmers. It has proven that KUR and KUT have not been fully utilized by data that in 2019 the realization of KUR and KUT distribution in the agricultural sector is still below 7 percent.

If traced, the main root of the capital problem is the low level of inclusion of smallholders farmers in Indonesia. Financial inclusion can be measured by access to financial services indicators, such as bank account ownership, formal savings, and formal credits. If farmers get literacy and access to financial services properly, farmers will be developed independently. Through financial literacy and inclusion, smallholder farmers can optimally utilize financial products or services including KUR and KUT for their farming businesses.

Besides that, reported from Setkab RI, the distribution of KUR in the agricultural sector increased rapidly in 2021, with a total distribution reaching IDR 42.7 trillion from the target IDR 70 trillion in 2021. Agricultural KUR has increased by 29.9 percent from 2020 to 2021. This indicates that there is a potential in increasing the inclusion of smallholder farmers in Indonesia. There should be various innovations to optimize this potential, so that food production capacity optimization and agricultural exports boost can be realized. Financial inclusion in the agricultural sector is the key to building the national economy. There are several roles youth can play to maximize these keys. First, young people can take a role in determining agricultural sector policies through ideas

for agricultural progress. One of them is regarding the government policies of accessibility of financial services that make it easier for farmers, optimizing farmer cooperatives as a place for financial literacy education of financial assistance and management. Second, young people can take advantage of their technological insights by creating financial technology innovations to meet the financial needs of farmers. Realization can start through digital platforms that provide financial consulting or peer-to-peer lending features to expand farmers' access to capital. Then, this platform can be introduced directly to farmers, either through lecture programs, social media or even to the surrounding environment. Millennials must be active collaborate in helping improve the welfare of farmers. Farmers are generally able to produce quality agricultural products. But most of them do not know how to make more profit and reduce capital. The way agriculture works must be changed to be more modern by using technology that can facilitate the work of farmers. In addition, young people should help minimize economic monopoly in this agricultural sector, farmers can also be taught to export to make more profits. However, export activities must still pay attention to the applicable policies. So, the government must also help improve the welfare of smallholder farmers by providing assistance in the form of capital and modern technology that can be applied by farmers. The government or parties related to agriculture also need to carry out campaigns to increase young people's interest in agriculture.

Although pandemics often strike, this should not be a hindrance, but a challenge to continue to advance the national economy. Agriculture as a support for the national economy is a great potential. Financial inclusion is the key to building the national economy through agricultural potential. To solve this problem, young people must get involved and take a role in agriculture, such as setting agricultural policies or creating financial technology innovations. In addition, young people should help minimize economic monopoly in this agricultural sector, farmers can also be taught to export to make more profits. The government must

also help improve the welfare of farmers by providing assistance in the form of capital and modern technology that can be applied by farmers. The government or parties related to agriculture also need to carry out campaigns to increase young people's interest in agriculture.

REFERENCES

Kementerian Koordinator Bidang Perekonomian RI. 2021. Pemerintah Dorong Inklusi Keuangan bagi Petani Milenial melalui Sinergi Program. Jakarta (ID). Kementerian Koordinator Bidang Perekonomian RI. Accessed on August, 19th 2021 via https://www.ekon.go.id/publikasi/detail/2976/.

Purwanto A. 2021. Ekonomi Indonesia pada Masa Pandemi Covid-19: Potret dan Strategi Pemulihan 2020-2021. Jakarta (ID): Kompas. Accessed on August 20th 2021 via https://kompaspedia.kompas.id/baca/paparan-topik/.

Rachmawati AR. 2020. Petani Lemah di Pemasaran dan Pendanaan, Masih Tergantung Tengkulak dan Rentenir. Bandung (ID): Pikiran Rakyat. Accessed on August 18th 2021 via https://www.pikiran-rakyat.com/ekonomi/pr-01338618/.

Sayaka B, Ashari. 2021. Sektor Pertanian menjadi Penyelamat Ekonomi saat Pandemi Covid-19. Bogor (ID) : PSE Litbang Pertanian. Accessed on August 18th 2021 via https://pse.litbang.pertanian.go.id/ind/index.php/covid-19/.

Setkab RI. 2021. Airlangga: Penyaluran KUR Sektor Pertanian Capai Rp42,7 Triliun di Tahun 2021. Jakarta (ID): Sekretariat Kabinet Republik Indonesia. Accessed on September 20th 2021 via https://setkab.go.id/airlangga-penyaluran-kur-sektor-pertanian-capai-rp427- triliun-di-tahun-2021.

Susanti R. 2020. Simalakama Petani Indonesia: Jatuh Bangun Cari Modal Saat Musim Tanam Tiba. Jakarta (ID): Regional Kompas. Accessed on August 19th 2021 via https://regional.kompas.com/read/2020/01/31/10565061/

NO. Registration: 036/SEC/I/9/21

Will The COVID-19 Pandemic Make Us Reconsider The Need or Agriculture Revitalization? (A Case Study in Ranau, Sabah, Malaysia)

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The COVID-19 pandemic has caused direct and indirect disruption to the agricultural sector and will have long-term effects on the industry after the pandemic ends (Barbosa, 2021). The impact on the food system has demonstrated the weakness of the supply chain. Improving the efficiency of agricultural production is also related to the food supply chain that consists of several important actors (Sjah & Zainuri, 2020). Five stages are involved in the food supply chain, including agricultural production, postharvest handling, processing, distribution, and consumption (Aday & Aday, 2020).

Therefore, this article aims to provide information on the effects of the COVID-19 outbreak in agriculture along the food supply chain and summarize the action that needs to be considered in reducing the impact, specifically in Ranau. Ranau is a highland located at the west coast division of Sabah. The fertile land produces 42.5% of Sabah's total vegetable crops, thus become the state's most vegetable producer (DOA, 2020). The main grown vegetables are carrot, watercress, snow pea, cauliflower, round cabbage, sweet pepper, asparagus, broccoli, and Chinese parsley. However, the pandemic that hit the country has caused some constraints in ensuring an adequate supply of vegetables to consumers.

The movement control order introduced by the government in curbing this pandemic has caused several problems. Among the issues that occur is that vegetables cannot be sold and distributed to buyers and wholesalers. It was estimated that more than ten metric tonnes a day of unsold vegetables during the first week of movement restriction came into force (Bernama, 2020). This issue leads to the dumping of vegetables and causes wastage. The vegetables become withered and thrown away, causing farmers to be less motivated to grow more vegetables (Figure 1).

Figure 1 (a), (b), (c): Vegetables that deteriorated on the farm, (d): Vegetables that cannot be sold and thrown by the roadside.

This results in disrupted export activities, therefore, affecting the main economic contributors of the Ranau district. Many have lost their sources of income, and unfortunately, farmers are poorly affected. The whole incident has generally affected the state of Sabah's revenue.

Figure 2: COVID-19 disruptions and impacts on agriculture in Ranau

Several actors are directly and indirectly involved in the context of this issue, including farmers, farmworkers, consumers, sellers or wholesalers, and policymakers.

Farmers play an essential role in ensuring the availability of food resources. Indirectly, the present global pandemic affects farmers' agricultural activities through work limitations and a lack of access to agricultural supplies, negatively impacting crop production. Besides, most farmers in the Ranau district still practice conventional farming. Although it is more productive, they are unsustainable, as it requires a lot of investment and consumes large amounts of energy (Cristache et al., 2018). Additionally, the farming approach leads to lower crop yields due to the farmer's reliance on agricultural supplies, resulting in a lack of capital for farming activities, whereby disrupting the supply of vegetables.

Agricultural workers become the backbone of farmers in producing agricultural products. Work restrictions will result in reduced agricultural yields and fewer jobs available. Workplace clusters due to COVID-19 that frequently occur in Malaysia further reduce the interest in working for fear of being infected with the virus.

In the case of movement restriction or there is a positive COVID-19 case in the workplace, sellers/wholesalers are also impacted, as they will no longer receive vegetable supplies from farmers for sale to consumers. This affects their revenue. In Ranau, some local farmers are also sellers who directly sell to consumers without any intermediaries. They usually sell at the markets or roadside stalls. However, the market opening was limited throughout the pandemic, and movement control orders resulted in fewer customers.

Consumers are the last party in the food supply chain. Movement control causes consumers to have less access to food supplies, including agricultural produce. It caused consumers to buy food at the nearest supermarket and without much interaction with more people. Thus, if a supply of vegetables is not available, this can lead to food insecurity, i.e. lack of access to nutritious and safe foods to lead an active and healthy lifestyle.

All actors in the value chain should indeed be supported financially and materially, and integrated approaches should be encouraged (Riccaboni et al., 2021). Policymakers such as the government are the ones with full authority to ensure agriculture's resilience during this pandemic. Enforcement of the policy is essential in ensuring that all parties are not affected and thus can continue the sustainability of the food supply chain and the future food system resilience.

Therefore, an appropriate approach is needed to stabilize the food supply chain to prevent their vulnerabilities from getting worse. Owing to the fact that the problems caused by the pandemic are indeed

alarming, there are a few questions that need to be answered promptly. Will Ranau be able to achieve resilience in the agricultural sector? Will Ranau be able to keep providing food to the community? Several actions need to be taken to cater for these issues.

Access to agricultural supplies such as fertilizers should be opened and not just agricultural products. This effort has been implemented in China and India, where 'green channels' have been introduced for fresh agricultural products. No roadblocks were imposed on fresh agriculture and its supply activity (Fan et al., 2021; Thapa Magar et al., 2021). In addition, the government should also subsidize agricultural supplies to farmers to reduce capital costs. This, in turn, might alleviate their stress and urge them to remain involved in the agriculture business.

Besides, introducing a large capacity of decentralized cold storage will overcome the problem of disposal and wastage of unsaleable vegetables. This action will accommodate the storage of vegetables that have been harvested before reaching the consumer, thus maintaining the freshness of vegetables. India has applied a similar approach to reduce postharvest yield losses during distribution (Priyadarshini & Abhilash, 2021).

The problem of horticultural losses can also be addressed through mechanization with the use of food processing machines. Agricultural products that are unfit to be sold can be processed into value-added food products, which can increase the shelf life of the farming products before they reach the consumers.

The use of technology like the internet of things (IoT) platforms and precision in farming techniques throughout the food supply chain help farmers to carry out agricultural activities more efficiently, help to facilitate the supply process, and consequently improve the economy of the local population. Another effective way to ensure the resilience of agri-food systems is to use digitized agri-food systems with the proper technology to assist farmers in growing and marketing food (Talukder et al., 2021).

Sustaining socioeconomic growth through collective agriculture and contract farming, including the One Village - One Product (OVOP) movement, aims to improve rural economic conditions, capital outflows, and industry shrinking. These strategies have shown remarkable results in reducing poverty, improving the local economy, increasing local creativity, and developing employment opportunities (Bagchi et al., 2021; Ren et al., 2021; Thanh et al., 2018).

Therefore, all parties involved need to work closely to revitalize the agricultural sector affected by the COVID-19 pandemic. The government needs to introduce the 'green channels' for farm products, subsidize agricultural supplies, use decentralized cold storage, use food processing machines, provide IoT platforms, precise farming techniques, introduce collective farming, contract farming, and OVOP to local people farmers. The proposed actions will be critical in shaping the agricultural sector's future in Sabah while boosting the economy in this pandemic situation.

REFERENCES:

Aday, S., & Aday, M. S. (2020). Impact of COVID-19 on the food supply chain. *Food Quality and Safety*, *4*(4), 167–180.

Bagchi, N. S., Mishra, P., & Behera, B. (2021). Value chain development for linking land constrained farmers to markets: Experience from two selected villages of West Bengal, India. *Land Use Policy*, *104*.

Barbosa, M. W. (2021). Uncovering research streams on agri-food supply chain management: A bibliometric study. *Global Food Security*, *28*.

Bernama. (2020). Kundasang farmers continue their vegetable cultivation efforts. *Media Permata*.

Cristache, S. E., Vuţă, M., Marin, E., Cioacă, S. I., & Vuţă, M. (2018). Organic versus conventional farming-a paradigm for the sustainable development of the European Countries. *Sustainability (Switzerland)*, *10*(11), 1–19.

DOA. (2020). Crop Statistics Booklet (Food Crops Sub-Sector) 2020. In *Crop Statistic* (p. 122). Department of Agriculture.

Fan, S., Teng, P., Chew, P., Smith, G., & Copeland, L. (2021). Food system resilience and COVID-19 – Lessons from the Asian experience. *Global Food Security*, *28*.

Priyadarshini, P., & Abhilash, P. C. (2021). Agri-food systems in India: Concerns and policy recommendations for building resilience in post-COVID-19 pandemic times. *Global Food Security*, *29*.

Ren, Y., Peng, Y., Campos, B. C., & Li, H. (2021). The Effect of Contract Farming on the Environmentally Sustainable Production of Rice in China. *Sustainable Production and Consumption*, *28*(1), 1381–1395.

Riccaboni, A., Neri, E., Trovarelli, F., & Pulselli, R. M. (2021). Sustainability oriented research and innovation in 'farm to fork' value chains. *Current Opinion in Food Science*, *42*, 102–112.

Sjah, T., & Zainuri, Z. (2020). *Agricultural Supply Chain and Food Security* (Issue January, pp. 79–88).

Talukder, B., VanLoon, G. W., Hipel, K. W., & Orbinski, J. (2021). COVID-19's implications on agri-food systems and human health in Bangladesh. *Current Research in Environmental Sustainability*, *3*, 1–8.

Thanh, L. H., Nhat, L. T., Dang, H. N., Ho, T. M. H., & Lebailly, P. (2018). One Village One Product (OVOP)-A rural development strategy and the early adaption in Vietnam, the case of Quang Ninh Province. *Sustainability*, *10*(12).

Thapa Magar, D. B., Pun, S., Pandit, R., & Rola-Rubzen, M. F. (2021). Pathways for building resilience to COVID-19 pandemic and revitalizing the Nepalese agriculture sector. *Agricultural Systems*, *187*.

NO. Registration: 084/SEC/I/9/21

AgriYOUTH: Promotion of Collaborative Internship in Rural Farms Towards A Resilient, Digitized and Competent ASEAN Agriculture

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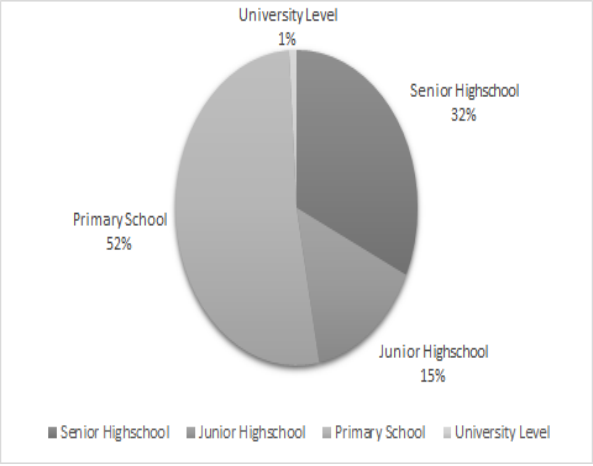
Since the pandemic began, its effects have been inflicting communities - all aspects of its mere existence. Consequently, the agriculture industry is one of the most affected since the lockdown and restrictions started. In fact, it is more difficult to witness and imagine the extent the Southeast Asian (SEA) farmers have to endure in order to survive this “far from over” global crisis.



Current State of Agricultural Sector

Other than the unfortunate impacts of the pandemic to the Association of Southeast Asian Nations (ASEAN) agriculture, this sector is already facing a harsh reality even in the pre-pandemic era. Figure 1 shows the alarming data in a village located at Bogor Regency in Indonesia that only 1% percent of the farmers finished a university degree and 52% of the farmers only reached primary school level. Indonesia has a similar agricultural setting with other SEA countries and this can be the root of why farmers have impoverished lives and also the cause of underdeveloped and outdated farm practices (Effendy et al., 2020).

Figure 1, Educational attainment of farmers in a rural area in Indonesia

Table 1 also reveals the uneven income distribution among farmers in selected SEA countries. This just shows the undervaluation of the agricultural sector and this inequality could be deemed from a lot of causes, it could be about the problematic value chain, improper allocation of budget, outdated farming methods and practices etc.

Table 1. Annual income comparison between a farm household and the average household income

	Average Farm Household Income	Average Household Income
Indonesia	Less than $1000	Approx $3488
Thailand	$3600	Approx $3700
Philippines	$2125	Approx $5562

In the year 2012, Table 2 shows that SEA is one of the most productive agricultural baskets in the world. Knowing this, it is more apparent that people should do more for the upcoming innovations and to resolve the present issues for the improvement of the agricultural sector most especially for the farmers, who are considered as one of the most important pillars in the food systems not only in ASEAN but in the world.

Table 2. ASEAN's total agricultural production in 2012

Crops	Total amount produced
Rice	129M tons
Corn	40M tons
Cassava	70.34M tons
Sugarcane	171M tons
Soybean	1.44M tons

The global crisis that we are facing today reveals that we are still far from securing a resilient and competitive agricultural sector in ASEAN.

With the issue at hand, this paper seeks to inspire a pragmatic solution that could elicit improvement to the humble lives of the farmers by advocating a collaborative approach to this matter. The following objectives are also points that the authors attempt to influence.

1. To make small scale farmers more knowledgeable and adaptive with modern technology and digitization that are useful in facilitating the operations and productions of farmers. This should be implemented fairly to promulgate the revolutionizing idea: “No farmers are left behind”.
2. Encourage the youth to be more interested and involved in agriculture-related issues and innovations.

The Model Background

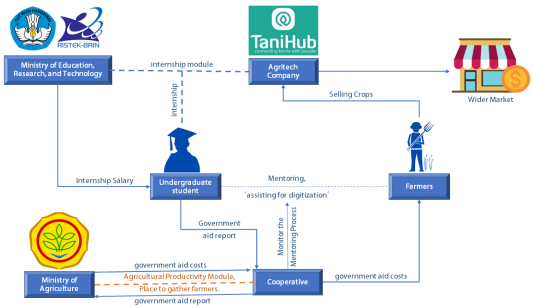


Figure 2. Innovation model

Several traditional markets, which are the main places where farmers can sell their crops, have been closed to suppress the spread of the COVID-19 virus. For modern farmers, it is a great momentum that can be used to expand their market with digital media. Unfortunately, based on the data disclosed above, more than half of Indonesia’s farming population only studied at elementary school level so their knowledge and ability to use digital media is lacking. Therefore, farmers need mentors who can teach them digitalization. In this program, farmers can be more resilient, and ready to face crises now or in future. It is hoped that this program can also be implemented in other Southeast Asian countries because they have almost the same agricultural problems.

Stakeholders Involved and Their Role

1. **The Ministry of Education** plays a role in making internship modules with agritech companies to recruit undergraduate students as well as providing internship salaries.
2. **The Ministry of Agriculture** has a role in making agricultural productivity modules with cooperatives and providing government aid costs to farmers through farmer cooperatives.
3. **The Agritech company acts** as a digital platform provider so that farmers have the opportunity to have a wider market.
4. **Cooperatives,** whose role is to gather farmers who are willing to join the program, distribute government aid costs, check financial reports, and monitor the program.
5. **Undergraduate students** act as mentors for farmers according to the internship module from the ministry of education and the ministry of agriculture.
6. **Farmers** as the main subject are entitled to get things according to the internship modules and productivity modules.

Each stakeholder involved in this collaborative approach plays an integral role to spark success for the agriculture sector and every step and interaction between the stakeholders are necessary to alleviate the condition of the people who provide us food to eat, the farmers.

As the world transitions into the “new normal”, people should perceive things not only differently but also smartly. This collaborative approach is just a piece of the many solutions that we all need to do in order to achieve the overall success of productivity of this sector. But if we work together, as one, this could be the start of a modern era for farmers where no one is left behind.

REFERENCES

Effendy, L., Pradiana, W., Haryanto, Y., & Harischandra, T. (2020). Farmer Behavior Transformation on Tomato Farming Business in Mega Mendung Subdistrict Bogor, West Java.

Invest In ASEAN. (n.d.). *Agriculture: ASEAN Investment*. Agriculture | ASEAN Investment. Retrieved September 20, 2021, from http://investasean.asean.org/index.php/page/view/agriculture.

Knoema. (2019). *Household income and Expenditure statistics of Thailand*. Knoema. Retrieved September 20, 2021, from https://knoema.com/THSHIE2019/household-income-and-expenditure-statistics-of-thailand?tsId=1000100&fbclid=IwAR3SAxpomXlsc49FuB7GnIchX3JyMNkofT4FQKFLklaRDBsKgWCS6C3_AZI.

OECD (2003), Farm Household Income: Issues and Policy Responses, OECD Publishing, Paris, https://doi.org/10.1787/9789264099678-en.

Digital and technology innovation/ added value

NO. Registration: 007/SEC/I/9/21

The Urgency of Digital Literacy For Indonesia's Farmers During Covid-19 Pandemic Era

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With its abundant multipurpose fertile soil, Indonesia is a major global producer of various agricultural products. Although agriculture's share of Indonesia's Gross Domestic Product (GDP) has declined, it still provides income for most Indonesian households today. According to the Food and Agriculture Organization (FAO), under current conditions, by 2050 the agri-food sector must produce 50% more food and feed to be able to meet the increase in food demand caused by an increase in the population of 10 billion. Animal protein from the livestock industry is one of human most essential sources of protein, both nutritionally and economically. According to the United Nations Food and Agriculture Organization (FAO), food demand will increase by 60% by 2050, and animal protein production will increase by 1.7 % per year between 2010 and 2050, with meat production projected to increase by nearly 70%, aquaculture by 90%, and dairy by 55 % (FAO, 2012).

Food insecurity will increase as climate change will bring about harsh climate events such as droughts and floods, tropical storms, heatwaves, and forest fires, which will affect production. In addition, technological changes are also expected to occur in the agri-food sector. Technological

innovation can increase yields by up to 30%, increase ecological efficiency, create new business models (Directorate General of Domestic Policy, 2019).

This projection shows the urgency for Indonesia to plan the supply of needed agricultural products and develop technological innovations for further progress. However, Indonesia is facing several economic crises where most sectors experienced negative growth due to the Covid-19 pandemic. As a result of the travel restriction policy (lockdown), the supply chain experienced significant disruptions due to reduced processing capacity, road and port closures, and transportation restrictions, which slowed agricultural production and food distribution from producers to consumers. In addition, due to disruption of the supply chain of agricultural food products, resulting in damage to crops and losses for farmers.

In particular, Covid 19 has had a very large impact on regional agriculture, one of the impacts of Covid 19 is agriculture in West Sumatra. Several agricultural areas in West Sumatra surveyed did experience a drastic decline in harvest orders from the market, this was due to a lack of customers (Nursaiti, 2021). Amid these limited conditions, shopping for agricultural food products through e-commerce is the only option. This indicates that farmers must look for other alternatives in selling their products, which using digital marketing.

However, the majority of farmers in Indonesia are not yet technology literate. According to a member of the Food Security Council, Khudori, the results of the 2013 agricultural census noted that most of the farmers were 45-54 years old. In addition to the problem of aging, the problem of farmers in Indonesia is also the low level of education. From the agricultural survey of the Central Statistics Agency in 2013, 32.7% did not finish elementary school, 39.9% finished elementary school, and 27.4% had junior high school education and above (Idris, 2017).

Whereas the use of technology can help farmers market their products more easily, thereby increasing income opportunities in a pandemic situation. Especially with the existence of Work From Home (WFH), where the majority of households switch to using e-commerce to buy agricultural products. To overcome this problem, there are several solutions proposed, which are:

1. Cooperation between farmers and MSMEs through Gerakan Nasional Bangga Buatan Indonesia (Gernas BBI).
2. Gerakan Nasional Bangga Buatan Indonesia (Gernas BBI) is an Indonesian government program that aims to encourage digitalization (onboarding) for offline MSMEs and encourage national branding of superior MSME products in various marketplaces (Kominfo, 2021). MSMEs are expected to be able to cooperate with small farmers to market their products, using a profit-sharing system.
3. Improving the competence of farmers related to digitalization
4. The government can help create extension programs, mentoring, and improving farmers' skills in digitalization, especially digital marketing. It would be even better if the program could help prepare farmers as exporters. The Indonesian government already has an export training program that includes digital marketing training, namely PPEI (Pendidikan Pelatihan Ekspor Indonesia), but the program only focuses on providing training for medium-large businesses. It is hoped that the government can create a similar training program that focuses on small farmers in Indonesia.

Currently, the Ministry of Agriculture is aggressively developing agricultural development movements at the sub-district level by optimizing the role of the Agricultural Extension Center (BPP), known as the Agricultural Development Strategic Command (KostraTani) by implementing those that harmonize the progress of agricultural development in the industrialization era 4.0 (Ministry of Agriculture, 2021). The Strategic Command for Agricultural Development (Kostratani)

is expected to be able to strengthen the production and coordination of agricultural stakeholders such as extension workers, farmers, and business actors at the field level through digital media. Kostratani has also collaborated with BukaLapak to help market farmers' agricultural products throughout Indonesia. It is hoped that this program can reach more farmers, especially in remote and underdeveloped areas.

The agri-food sector is one of the priorities of the Indonesian government. However, exogenous factor to the economy, especially the Covid-19 pandemic, have slowed the agri-food sector. However, efforts must be accelerated to strengthen food security and increase employment opportunities. To get the maximum impact, these efforts must be comprehensive and interrelated with each other, so that there is no unnecessary weighting between these impacts.

REFERENCES

Directorate General for Internal Policies Policy Department B. 2019. Megatrends in the agri-food sector: global overview and possible policy response from an EU perspective. https://www.europarl.europa.eu/cmsdata/188567/Pt7%20_Megatrends_PPT_EN-original.pdf.

FAO. 2012. Global Food Outlook November 2012/ FAO World agricultural towards 2030/2050 -2012 Rev/ OECD FAO Ag Outlook 2013 Food and Agriculture Organization of the United Nations Via delle Terme di Caracalla 00153 Rome – Italy.

Idris,M. 2017. Mayoritas Petani RI Berusia 45-54 Tahun dan Tamatan SD. Mayoritas Petani RI Berusia 45-54 Tahun dan Tamatan SD (detik.com).

Kominfo. 2021. Inilah Dukungan Pemerintah Agar UMKM Go Digital dan Go Global. https://kominfo.go.id/content/detail/36064/inilah-dukungan-pemerintah-agar-umkm-go-digital-dan-go-global/0/berita.

Ministry of Agriculture. 2021. BBPSDMP Kementan Optimalisasi BPP Kota Banjar Melalui 5 Peran Kostratani. https://bbpkhcinagara.com/site/detail-news-bbpsdmp-kementan-optimalisasi-bpp-kota-banjar-melalui-5-peran-kostratani.

Nursaiti. 2021. Dampak Sektor Pertanian Indonesia Di Masa Pandemi Wabah Covid-19. http://bem.unp.ac.id/news/LXYz0wPQDhbm2lsIW3jH/dampak-sektor-pertanian-indonesia-di-masa-pandemi-wabah-covid-19.

NO. Registration: 002/SEC/I/9/21

Unmanned Aerial Vehicle: A Step Closer To Modern Agriculture

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The Covid-19 pandemic, pushed on by social interaction, has impacted various economic sectors, namely agriculture. This is a vital sector that puts food on the table for many families. In 2020, the pandemic caused an overall fall in the national economy but the agricultural sector still managed to grow positively. However, the increase in farmer welfare as measured by the farmer's exchange rate (NTP) is not proportional to the GDP of the agricultural sector which was able to grow above 2 percent from quarter 1 to quarter IV (Figure 1).

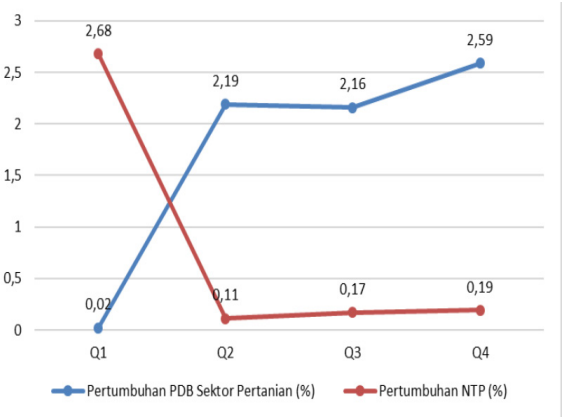

Figure 1. GDP and FTT Growth in 2020 (y on y)

Source: BPS

Based on data analysis from NTP, the factors causing the growth of FTT or farmers' welfare are not proportional to the GDP growth of the agricultural sector due to the increase in all agricultural production costs. One may attribute this fall in FTT to low crop productivity, but in reality the issue lies where a majority of Indonesian farmers produce crops at low income and economic productivity levels (Warr, 2018). With this, agricultural technology is essential to adapt to the changing times and support the productivity of the agricultural sector. The supporting indicators for the success of modern agriculture are human resources, high quality seeds, quality agricultural products, and high-tech mechanization and an example of the application of modern agricultural development in Indonesia is UAV Agriculture. Unmanned Aerial Vehicle (UAV) is a type of remote-controlled aerial roaming robot.

The UAV system can carry out programmed missions, with the characteristics: (i) unmanned, (ii) operating in fully or partially independent modes, (iii) suitable for repeated use (Department of Defense, 2007, in Wikantika, 2009). Unmanned mapping technology is an alternative option to other mapping technologies such as aerial photography, both large and small manned and satellite-based mapping. UAVs are equipped with a flight control system via radio waves, precision navigation (Ground Positioning System - GPS and Inertial Measurement Units), flight control electronics, and high-resolution camera equipment. UAVs can also be equipped with multispectral cameras for agricultural research. The camera has red, green, and NIR (Near Infrared) bands close to bands 2, 3, and 4 in Landsat TM images, which can be used to calculate the greenness of plants, such as the Normalized Difference Vegetation Index (NDVI), Soil Adjusted Vegetation Index (SAVI), and crop canopy. Research conducted by Lin (2008) also shows that the UAV is also equipped with laser sensors to produce three-dimensional images, as a support for land elevation mapping and Digital Elevation Model (DEM). The sensing devices that are flown on the UAV include video cameras, multispectral and hyperspectral sensors, thermal sensing, synthetic aperture radar (SAR), and atmospheric sensing. More than monitoring crops in real time, accurate aerial views would also allow farmers to identify and analyze issues related to irrigation, soil conditions, and the prevalence of weeds (Gaglione, 2020). Through gathering accurate environment data, agricultural professionals can make informed decisions regarding issues on output, management, and overall crop health (Gaglione, 2020).

Figure 2. Use of UAVs for Agriculture Drones

Source: Ministry of Agriculture, Republic of Indonesia

Several land identification and monitoring activities have been carried out, yielding promising results. Research conducted by Laliberte (2009) in collaboration with USDA-ARS showed results which were suitable for the purpose of classifying vegetation in the rangeland area of the Jornada Experimental Range, New Mexico. UAV can be easily operated anywhere, and can be done repeatedly to detect changes, so that real time images can be obtained; it is able to fly low to produce high-resolution images; it has lower operating and maintenance cost, with diverse applications; and no pilot required, making it relatively safe.

However, this UAV also has limitations, the UAV does not work well in strong winds as Lin and Lee (2008) demonstrated when it was used to measure wind speed in typhoons; the initial investment cost is relatively expensive (depending on the size and complexity of the UAV); unclear training and regulatory requirements for flying a UAV in the air; limitation of image sensor capabilities; and image processing can be more difficult if the stability of the aircraft is low from the use of low-quality sensors.

According to the World Bank collection of development indicators, the agricultural land in Indonesia is at a staggering 33.18 % in 2018 (TRADING ECONOMICS, 2021) and the agricultural sector remains to be the largest sector of employment providing jobs for over 38 million people (Statista, 2021). These numbers themselves indicate that we should put no less than maximum effort to work towards a sustainable development of the agricultural sector of Indonesia. While there are disadvantages to the usage of UAV, according to Suryanto (2006) the risks arising from the use of this device are significantly small. The existing obstacles can be minimized through conducting research and development of applied studies, continuous physical and functional tests according to specifications and uses, so as to overcome the shortcomings of the UAV and to ensure that the accuracy of the results can be accounted for both in theory and practice. Lastly, collaboration between the government, private sector, and the agricultural professionals needs to be carried out for a more productive and inclusive modern agriculture development.

In the future, low-cost UAV technology can be applied operationally in Indonesia for several sensory applications, including agricultural land management, monitoring environmental conditions and the use of natural resources. In other fields, they can be used for analyzing Earth's dynamic processes, supporting research for global climate change (carbon trading), assisting law enforcement action, assisting search and rescue teams, wildlife inventory, mapping and geodetic measurements, conducting environmental impact assessments, developing environmental observations, as well as for disaster risk reduction. While these applications may seem unrelated to agriculture, they indirectly promote a stable, safe and sustainable environment for farmers and humanity as a whole.

REFERENCES:

Barnard Microsystems Limited. (2011). *Developing Unmanned Aircraft Systems to benefit Mankind*. http://www.w.w. barnard microsystems. com/L2_unmanned_air_systems.html

Expertise Board of DPR RI. (2021, February). *Industry & Development Budget Issue Brief*. Center for Budget Studies. https://berkas.dpr.go.id/puskajianggaran/bib/public-file/bib-public-4.pdf

Gaglione, A. (2020, October 22). *Indonesia. Agriculture Friendly Drones*. United World Project. http://www.unitedworldproject.org/en/workshop/indonesia-agriculture-friendly-drones/

Laliberte, USA (2009). Aircraft System Without Build. Rangeland Assessment and Monitoring Methods Guide. A joint project of The Nature Conservancy and the USDA Agricultural Research Service. http://abstracts.rangelandmethods.org/doku.php/remote_sensor_types:unmanned_aerial_vehicle

Lin, PH, & Lee, CS (2008). *The eyewall-penetration reconnaissance observation of typhoon longwang (2005) with unmanned aerial vehicle, aerosonde, J. Atmos. Ocean. Techn* (Vol. 25).

Lin, Z. (2008). *UAV For Mapping - Low Altitude Photogrammetric Survey* (B1 ed., Vol. XXXVII). The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences.

Ministry of Agriculture of the Republic of Indonesia. (nd). *Advanced Drone Technology Used by Farmers*. Retrieved 9 11, 2021, from https://www.pertanian.go.id/home/?show=news&act=view&id=3995

Riandi, N. (2020). *Fixed Wing Vertical Take Off Landing Drone Control System Design.*

Suryanto, F. (2006). *The Development and Utilization of Unmanned Aircraft (PTTA) And The Readiness Of Its Supporting Personnel* (2289th ed., Vol. 9). Indonesian Defense Research and Development Bulletin STT.

Statista. (2021, July 19). *Agriculture industry in Indonesia- statistics & facts*. https://www.statista.com/topics/7732/agriculture-industry-in-indonesia/ TRADING ECONOMICS. (2021, September). *Indonesia - Agricultural Land (% Of Land Area) - 1961–2018 Data | 2021 Forecast*. https://tradingeconomics.com/indonesia/agricultural-land-percent-of-land-area-wb-data.html

Warr, P. (2018, August 1). *How can Indonesia assist its farmers?* East Asia Forum. https://www.eastasiaforum.org/2018/08/02/how-can-indonesia-assist-its-farmers/

Wikantika, K. (2008). *Unmanned Mapping Technology: Development and Applications. One Day Workshop "Unmanned Mapping Technology: Development and Applications" (UnMapTech2008)*.

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Construction of Resource Agriculture: Establish A Systematic and Strict Food Safety Management Record System To Supervise Agricultural Development

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There are many impacts of COVID-19 on agriculture. In terms of agricultural means of production enterprises, many of them have insufficient reserves and their production capacity tends to decline. In 2019, the prices of basic raw materials such as nitrogen fertilizer, phosphate fertilizer and potash fertilizer were low, and the prices of most active ingredients of pesticides were falling. The agricultural machinery industry was also in a downward channel, which directly led to the shortage of raw materials in agricultural materials enterprises. And because the Spring Festival is earlier this year, the vast majority of agricultural enterprises will arrange production after the Spring Festival. Under the current epidemic situation, the purchase of raw materials, resumption of work and transportation have been greatly affected, and the trend of declining production capacity of agricultural materials enterprises should be on alert.

The impact of the new crown pneumonia epidemic on agricultural enterprises

It should also be noted that poultry farming enterprises have been greatly impacted. Around the Spring Festival this year, the spread of COVID-19 spread to breeding enterprises, and many provinces and cities across the country issued regulations banning the sale of live poultry, especially special breeding (such as bamboo mice, pheasant breeding, etc.), and closed trading markets. In addition, due to the suspension of some feed enterprises, some breeding enterprises feed supply in a timely manner, to prevent the spread of the epidemic, road closures and other measures led to difficulties in poultry transport.

The impact of the new crown pneumonia epidemic on agricultural enterprises

From the overall point of view, the particularity of fruits, vegetables, livestock and poultry and agricultural products has special requirements on the quality of storage and preservation. Limited logistics causes serious disorganization of production and sales links, and the supply of raw materials for agricultural products is in place. Fruit and vegetable planting, animal husbandry and poultry industry suffer more serious losses than other agricultural industries. The impact of the epidemic on circulation has caused a series of chain reactions, leading to industrial chain rupture and structural disconnection between supply and demand.

COVID-19 Impact on China Agri-Food Sector

The supply pressure on the agricultural material market affects later agricultural production. Due to the relatively sufficient stock in the early stage, it did not have a major impact on spring plowing in the south and winter wheat and spring pipe in the north, and the supply of agricultural materials in spring was basically stable. However, with the gradual digestion of agricultural material inventories, the pressure to meet the annual supply of grain and other crops has increased. In particular, Hubei is an important fertilizer production province in my country, and the fertilizer operating rate has dropped significantly compared with the same period. In addition, some agricultural materials such as chemical fertilizers are "two ends", one side of ore resources needs to be imported in large quantities, and a large number of agricultural materials and products are exported on the other side. In 2019, my country imported 11.104 million tons of mineral fertilizers and chemical fertilizers, an increase of 16.9%. The recent overseas epidemic has shown a trend of rapid spread. If it is not effectively controlled in the short term, it may affect the import of fertilizer raw materials. The rise of unemployment also means the decline of labor productivity, affecting how we consume and produce food.

Agricultural product supply management

Ticket purchase voucher and ticket collection system

1. Strictly review the licenses and food qualification certificates of suppliers during the COVID-19 period (including sellers or producers who directly supply goods).
2. For outsourced food, obtain and carefully check the supplier's business license, production license or circulation permit, and mark the relevant quality certification certificate of the food that has passed the relevant quality certification, the effective commodity

inspection certificate of the imported food, the planting staff, the sales staff and Yuan or personnel's physical condition shall be assessed, and if applicable, and national regulations shall issue an inspection and quarantine certificate for food that has passed inspection and quarantine. When purchasing food for the first time within the validity period, the above-mentioned relevant certification documents shall be required.

3. When purchasing food, obtain the official sales invoice issued by the supplier; or obtain the sales voucher stamped or signed by the supplier in accordance with the relevant national regulations, and retain the real address and contact information; the sales voucher should contain the name, specification, and quantity of the food, Unit price, amount, date of sale, etc.
4. The requested business license (ID card), production license, circulation permit, quality certification certificate, commodity inspection certificate, inspection and quarantine qualification certificate, quality inspection qualification report and sales invoice (voucher) should conform to the supplier's name or food type classification File it for future reference. Relevant files should be properly kept, and the preservation period shall not be less than 2 years from the date of purchase of the food.

Inspection record system for food safety management

1. For each purchase of food, truthfully record the name, specification, quantity, production batch number, shelf life, supplier name and contact information, date of purchase, etc. of the food, and be careful not to carry virus products.
2. Food safety management personnel regularly check the purchase account, check the storage and quality of food. Foods that have been in contact with the virus should be directly discarded, and consumers should be reminded to immediately stop buying and selling foods

from virus sources, remove the counter for destruction, or report to the industrial administrative department by the administrative department for industry and commerce. Disposal according to law, the handling of food should be truthfully recorded in the purchase ledger.

Countermeasures to food supply problems

1. Coordinating existing platform resources to do a good job of connecting the supply and demand of agricultural products. Some Internet platform companies have spontaneously established a docking platform for the supply and demand of unsalable agricultural products. It is necessary to further integrate and optimize existing resources, and encourage Internet platforms, logistics companies, and agricultural product trading companies to actively participate in helping farmers to ensure supply by using their technological advantages. While alleviating the unsalable sales of agricultural products, we will solve the livelihood problems of the shortage of fruits and vegetables in some areas, high prices, and reduction of varieties.
2. Do a good job in epidemic prevention and control and clear the "last mile" of transportation of agricultural products as soon as possible. The issuance of agricultural production and circulation policies has alleviated the transportation problems of agricultural products to a certain extent. The main road transportation situation has improved significantly, but the phenomenon of grassroots epidemic prevention and self-enclosure is still prominent. "Village entrance" obstruction directly caused a large number of fruits and vegetables to be unable to be transported or even rotted in the ground. Seek truth from facts to do a good job in prevention and control, compact the main responsibility of agricultural product transportation guarantee, and prevent the increase in the city closure policy from causing harm to the farmers.

REFERENCES

Farmers'Daily (February 23, 2020.), The impact of the new crown pneumonia epidemic on agricultural enterprises and their response, Research from http://www.xinhuanet.com/food/2020-02/23/c_1125613864.htm.

Xinhuanet (April 30, 2020) The impact of the epidemic on my country's agricultural development.Research from http://www.farmer.com.cn/2020/04/30/wap_99852313.html.

Agri-business development

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Circular Economic Activities in The Development of Sorghum Agribusiness System as An Effort for National Economic

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Sorghum (Sorghum bicolor L. Moench) is a cereal food crop that has great potential for cultivation. This plant can grow on marginal land, meaning that it can be cultivated on dry land and is resistant to pests and diseases (Balitbangtan, 2014). Sorghum is an opportunity in itself because Indonesia has a land area of 188.20 million hectares, mostly consisting of 144 million hectares of dry land (Hidayat and Mulyani 2002).

The existence of sorghum in Indonesia is still difficult to find because there are still few farmers who develop sorghum, especially as food. This is because farmers often judge sorghum as a difficult plant to trade. Whereas all parts of sorghum can be of economic value if managed optimally, so that no part of sorghum is wasted as waste. The utilization of all parts of sorghum is closely related to the concept of a circular economy.

The Circular economy is a concept that emphasizes that production and consumption processes must minimize waste to near zero (Rizos et al. 2017). The series of circular economic activities in the development of sorghum can be described through an agribusiness approach. The agribusiness system is all farming activities that are interrelated with each other, starting from the procurement of facilities to the marketing of processed products of the harvest.

The agribusiness sector is the largest and most important economic sector in the national economy. The agribusiness sector can absorb more than 75% of the national workforce, including 21.3 million small-scale business units in the form of household businesses. So 80% of the national population depends on the agribusiness sector. Such a large role of the agribusiness sector in the national economy has important implications for future national economic development (Saragih, 1997). Therefore, the agribusiness sector is very important to be maximized.

This paper aims to provide an overview of circular economic activity in the development of the sorghum agribusiness system as an effort to maximize the potential of sorghum which will ultimately affect the improvement of the national economy. This paper was written and formulated using a qualitative approach. The data was obtained from primary data and secondary data. Primary data was taken from an interview with one of the sorghum farmers. While secondary data were obtained through literature studies. The types of literature used are journals, books, newspapers, electronic media, and credible articles.

Sorghum can be developed as an alternative crop to meet the needs of food, feed, and industry. As a foodstuff, sorghum is ranked 5th after wheat, rice, corn, and barley (Sirappa, 2003). In terms of financing, the financing of sorghum farming is relatively low (Rismunandar, 2006). From a financial point of view, growing and developing sorghum cultivation can provide considerable benefits for farmers. This is because all parts of sorghum can be utilized and processed. The main part of sorghum can be used as a substitute for rice or raw material for making flour. As for the sap part of the sorghum stalk, apart from being used as bioethanol, the pulp and sorghum leaves can also be used as animal feed and resold to provide additional income for farmers.

In terms of marketing, Sorghum products can reach all segments of society. In its approach to lower-middle-class consumers, Sorghum products can take advantage of a more affordable price compared to other staple

products. While the approach for middle to upper consumers, sorghum products can take advantage of the advantages of its products, namely that it can be consumed by people who are concerned with gluten protein so that it is by the needs of a gluten-free diet (Aulia, 2016).

Sorghum also has potential if it is developed massively because it provides many advantages. Based on interviews with sorghum farmers, in one planting period, sorghum can be harvested 3-4 times for approximately 8.5 months for feed needs. As for foodstuff needs, sorghum can be harvested 2-3 times a year with a fairly good product, which is more than 2 tons for 1 hectare of planting land (Aulia, 2016).

Sorghum is well known by farmers in Indonesia, but its cultivation is still limited. The main problem in the development of sorghum is the comparative and competitive advantage of sorghum which is relatively low and sorghum farming at the farmer level is not yet intensive (Angga, 2016). In terms of agriculture, the problems of sorghum commodities include equipment for post-harvest processing of sorghum which is still difficult to do at the household scale, the level of education of farmers is still not high because there is still uneven distribution of information and farming development, lack of availability of varieties for farmers, and provision of seeds did not meet the five exact criteria, namely type, quantity, quality, time, and place.

To improve the development of sorghum commodities, there are several things that can be done, including optimizing the sorghum agribusiness system, starting from the upstream subsystem to the marketing subsystem. In the upstream subsystem, it can be maximized through the provision of seeds, fertilizers, medicines, and agricultural tools for farmers by the government. In addition, it also expands the sorghum planting area by utilizing dry land. In the farming production subsystem, periodic counseling and guidance on good sorghum cultivation can be provided. Then in the processing subsystem and the agricultural product

industry, the government can provide training or guidance on post-harvest processing so that farmers do not hesitate to develop sorghum commodities in their farming business. Then, in the agricultural product marketing subsystem, can establish cooperation with the livestock industry, food industry, to the fuel industry to distribute the results of sorghum processing. All of these subsystems need to be supported through agricultural institutions that accommodate farmers so that sorghum agribusiness activities can run effectively and efficiently through coaching, providing physical and non-physical support, and periodic control.

The parties that are expected to help support the creation of an integrated sorghum agribusiness system include the role of the government, the private sector, financial institutions, BUMDes, to research and development agencies. The government, namely the agricultural service, plays a role in providing assistance or subsidies to farmers ranging from seeds, agricultural tools, fertilizers, and so on. The private sector, such as livestock, the food industry, plays a role in providing market access for sorghum processing products. Conventional banks or other financial institutions can play a role in providing loans to farmers through people's business loans. Local BUMDes play a role in designing strategies for strengthening the circular economy chain that will increase added value. Meanwhile, the Research and Development Agency is expected to provide input related to business development and sorghum cultivation.

Sorghum is a very potential agricultural commodity to be developed in Indonesia. All parts of sorghum starting from roots, seeds, stems, and leaves can be processed and utilized, so that it is in harmony with the concept of a circular economy. Unfortunately, this commodity is still not familiar and has not been developed optimally. It is necessary to develop an integrated sorghum agribusiness system starting from the upstream subsystem to the supporting subsystem. The agribusiness sector is the largest and most important economic sector in the national economy

because most of the national population depends on this sector for their livelihood. Through the support of various parties, it is hoped that the sorghum agribusiness sector can continue to develop which will then have an impact on increasing national economic development.

REFERENCES

Angga, Satria Waratama .2016. Uji Adaptasi 8 Genotipe Sorgum (Sorghum Bicolor L Moench) Pada Ultisol di Limau Manih. Diploma thesis, Universitas Andalas.

Aulia, Rifdah. 2016. Peluang dan Potensi Bisnis Sorgum di Indonesia. https://www.kompasiana.com/auliarifdah13/5852b5cea0afbd222d0e4256/peluang-dan-po tensi-bisnis-sorgum-di-indonesia. Diakses 6 September 2021.

[Balitbangtan] Badan Penelitian dan Pengembangan Pertanian. 2014. *Manfaat Sorgum Selain Untuk Pangan*. http://www.litbang.pertanian.go.id/info- teknologi/1841. diakses 8 Feb 2021.

Hidayat, A. dan A. Mulyani. 2002. Lahan Kering untuk Pertanian. Buku Teknologi Pengelolaan Lahan Kering Menuju Pertanian Produktif dan Ramah Lingkungan. Pusat Penelitian dan Pengembangan Tanah dan Agroklimat, Bogor. hlm. 246.

Rachmina, D. 2015. *Evolusi Pendidikan Tinggi Agribisnis Indonesia*. Bogor (ID): Departemen Agribisnis.

Rismunandar. 2006. Sorgum Tanaman Serba Guna. Sinar Baru. Bandung.

Rizos V, Tuokko K, Behrens A. 2017. The Circular Economy A review of definitions, processes and impacts [internet]. Brussels (BEL): Centre for European Policy Studies; [diunduh 2021 Feb 9]. Tersedia pada: https://www.ceps.eu/ceps-publications/circular-economy-reviewdefinitions- processes-and-impacts/.

Saragih, bungaran. Refleksi Agribisnis. Bogor: IPB Press.

Sirappa, M. P. 2003. Prospek pengembangan sorgum di Indonesia sebagai komoditas alternatif untuk pangan, pakan, dan industri. Jurnal Litbang Pertanian. 22: 133-140.

Syawie M. 2012. Ketahanan pangan dan kesejahteraan petani. *Jurnal Informasi.*17(3): 158-164.

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Agribusiness and Its Implementation in Indonesia

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The Merriam-Webster dictionary defines agriculture as the "science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products". Rubenstein (2003) also posits that agriculture is modifying a portion of the Earth's surface through the deliberate effort to cultivate crops and/or raising livestock for economic or sustenance purposes. In simple terms, agriculture may be viewed as a business enterprise, an activity, and/or a livelihood practice. Agriculture is often perceived as synonymous with farming; However, the practice of agriculture is based on a systematized body of knowledge (science) and requires skill (art).

With this, agriculture is often a prioritized sector in soil-rich countries, such as Indonesia. It has been said that Indonesia's extensive agricultural sector includes both state-owned and private major plantations alongside smallholder farming. While the larger plantations focus on national key exports (such as palm oil and rubber), smaller scale plantations are said to concentrate more on main commodities of the Indonesians, such as rice, soybeans, corn, fruits, and also vegetables. According to the In-Depth Research and Analysis Report of Indonesia's Grain Market for 2020-2024 issued by the New Thinking Industry Research Center, agriculture plays an important role in the national economy in Indonesia; With 59% of the population engaged in fisheries and forestry, the country developed

agribusinesses to further assist the country's economy. The sector has worked well over the years as an economic pillar for Indonesia; However, the COVID-19 pandemic presented new and unprecedented challenges to the sector.

Lower agricultural production in Indonesia has been said to be a result of lack of complete water storage and irrigation systems in most of Indonesia (see Kadri & Sinukaban, 2006; Oad, 2001; Strauß, 2011). Klock & Sjah (2011) also discusses that the Indonesian water systems heavily rely on the country's weather conditions, which may also be the catalyst for losses (due to droughts, floods, etc.). Additionally, capital investment on the different factions that make up the agricultural system remains to be low (Tabor, 2015); Popularization of agricultural science and technology, the farmers' education, their investments on crop production, and development of agricultural mechanisms remains to be of average standard. At present, there are about 10 rice varieties researched by Indonesia, and the average yield is only 4 to 5 tons/ha (Sosiawan & Annisa, 2019). In addition, due to the high price of rice seeds, 40% of Indonesian farmers cultivate the rice seeds themselves. Moving down the value chain, farm processing and trade is coping with supply and demand shocks, where production activities are hampered by quarantine restrictions and consumer demand is low, as the food and beverage industries are hampered by restricted operations.

More than the difficulties in the acquisition of materials to ensure a productive harvest, arable land and fertile soil has been cited to be on the decline. Besides being the very foundation of agriculture, soil tending is important as it also secures safe and healthy harvest for the masses' consumption. Chemical fertilizers have long been utilized by the agricultural sector for the reasons that it is believed to be an important factor in decreasing the harvest time and chances of spoilt harvest (Peng, et al., 2020); However, these chemicals have long term effects on

the soil. It has been said that chemical fertilizer use is highly regarded in Indonesia despite its unsustainability. This can then be helped by the promotion of compound fertilizers that may be readily available from food scraps and other raw materials (Yamika & Ikawati, 2012).

Despite these challenges, it is vital to underline the opportunities that the various stakeholders in the Indonesian agribusiness may consider to strengthen the industry, and subsequently the country's economy. Agribusiness, with its systems and mechanisms, can be further developed with today's modern technology. Robots and other machineries available in the market can be considered to sufficiently power and modulate the different roles around the agricultural lands. Sensors may also be utilized to keep track of certain processes as well as control humidity and moisture to ensure better harvest. Drones and GPS can be used to establish an aerial view of the land to be tended to and can be redesigned to spray pesticides from a considerable distance. While these technologies can be quite expensive- especially with the low capital investment- further studies and reprioritization of what may be needed and what is efficient shall be observed.

Additionally, greater coordination within the involved stakeholders to promote agricultural innovations at the national sectoral level should be considered. Collaborating broader science and innovation policies could ensure a national standard quality that can yield better agricultural results- whether faster production time, better quality, or more involvement, the possibilities are there. Also, efficient use of regional resources and produce food products in accordance with market demand. For example, the yield of rice in the north is high, but the area is not large. Because of its good quality, the economic benefits of planting are also high. Other crops can be planted in areas where rice is not suitable to make up for the lack of feed. It is necessary to give full play to local resource advantages to produce food products and other cash crop products demanded by the market.

There are many opportunities that the Indonesian agricultural sector can take advantage of- however, it is vital for the stakeholder to play an active role in measuring, implementing, and regulating these opportunities. Developing agribusiness in Indonesia is not, and should never be, a job solely for the farmers. It is the active collaboration, productive development, and organizational interactions that makes the industry thrive. More than executive policies and scientific research, the role of social groups and civil society must be highlighted. Promotion of agriculture in Indonesia, or in any other country for that matter, is essential to further develop agri-consciousness within society. Development, Innovation, and maturity of Indonesian agriculture can be perceived to be dependent upon smarter and more collaborative efforts of those involved in the supply chain. Although the pandemic has brought an onslaught of difficulties for the agricultural sector, it is critical to recognize that there are, and shall always be, productive opportunities available in order to ensure a more fruitful nation.

REFERENCES

Agriculture. (n.d.). In Merriam-Webster.com dictionary. Retrieved from https://www.merriam-webster.com/dictionary/agriculture

Kadri, T., & Sinukaban, N. (2006). Integrated Watershed Management To Prevent Flood And Sustain Water Resources In Jakarta, Indonesia.

Klock, J., & Sjah, T. (2011). Farmer water management strategies for dry season water shortages in central Lombok, Indonesia. *Natural Resources*, *2*(02), 114.

Meylinah, S. (2021). *Grain and Feed Update*. Global Agricultural Information Network. U.S. Department of Agriculture, Indonesia.

Oad, R. (2001). Policy reforms for sustainable irrigation management–a case study of Indonesia. *Irrigation and Drainage: The journal of the International Commission on Irrigation and Drainage*, *50*(4), 279-294.

Peng, S. H. T., Yap, C. K., Arshad, R., & Chai, E. W. (2020). Bio-organic, bio-chemical fertilizers and N-Fixer (N-Bio Booster) improve paddy yields in the field trials at Langkat in Medan, Indonesia.

Rubenstein, J.M. (2003). *The Cultural Landscape: An Introduction to Human Geography*. 7th ed. Upper Saddle River, NJ: Pearson Education, Inc. p. 496

Strauß, S. (2011). Water conflicts among different user groups in South Bali, Indonesia. *Human Ecology*, *39*(1), 69-79.

Sosiawan, H., & Annisa, W. (2019). Yield Response And Water Productivity For Rice Growth With Several Irrigations Treatment In West Java. *Sriwijaya Journal of Environment*, *4*(2), 109-116.

Tabor, S. R. (2015). Constraints to Indonesia's economic growth.

Tri, S. (2017). Assessment of several amphibian rice varieties in the Center of rice production in Lamongan Regency of east Java Province. *Russian Journal of Agricultural and Socio-Economic Sciences*, *69*(9).

Yamika, W. S. D., & Ikawati, K. R. (2012). Combination inorganic and organic fertilizer increased yield production of soybean in rain-field Malang, Indonesia. *American-Eurasian Journal of Sustainable Agriculture*, *6*(1), 14-17.

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Agribusiness in Indonesia and Its Relevance to Opportunities in Technology Sector

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Agribusiness is defined as the business sector that encompasses all of the procedures associated with getting an agricultural product to market. In countries with agricultural farmland, which including Indonesia, this industry is one of the most important components of the economy. Agriculture is the sector of the economy in Indonesia that provides the primary source of food and income for many impoverished people. Investing in agriculture, on the other hand, is not only one of the most effective government strategies for improving food security and promoting sustainability, but it is also critical to the economic development of many countries. Growth, advancement, good change, or the addition of physical, economic, environmental, social, and demographic components are all aspects of development. The goal is to improve people's living standards and quality of life, as well as to create or expand local regional income and employment opportunities, all while preserving the environment's resources.

Indonesia's agricultural sector includes the major plantations (both state-owned and private) as well as smallholder farming. Large plantations tend to concentrate on commodities that are key export exports (palm oil and rubber), whereas small-scale farmers concentrate on a little main commodity such as rice, soybeans, corn, fruits, and also vegetables. Indonesia got so many chance that can be used for developing the economics and the country by utilize its agriculture and agribusiness. The Indonesian government has prioritized self-sufficiency in a number

of agricultural commodities. This statement applies to rice commodities which by far is the main food for the majority of the population; Indonesia has the highest per capita rice consumption in the world (approximately 139 kilos per capita per year).

The government and also the country got their job to develop the agribusiness in Indonesia. Agribusiness itself is not just about business, agribusiness contains another thing. To expand their proficiency, organizations inside the farming business execute procedures such as vertical integration. Agribusiness itself includes all economic activities that's related to the food production process, that is identified by including farm manufacturing, pesticide and fertilizer, agricultural research and development, seed supply, crop and food storage, and also other activities that related to agriculture.

Actually, there is so many ways to develop Agribusiness in Indonesia. Agribusiness now is way more modern and it's easy connecting it with today's technology. The technology that can be used in agribusiness are robots, sensors, drones, GPS, etc. To increase efficiency, robots can be deployed to do different roles around the farm. Harvesting and watering systems, for example. Sensors can also be used to keep track of a specific process. Controlling humidity and moisture, in example. Drones can be used to get an aerial view of the land and establish whether it need maintenance. Spraying pesticides is an example. For the meantime, GPS technology is widely designed to gather information and designed better plans for the harvest. Example: Automated steering tractors.

The opportunities are also there. It's up to us whether to maximizing those opportunities or just let those precious opportunities go. The opportunities that could help us for developing the Agribusiness in Indonesia are: businesses working together lead to innovation and new technology; the possibility of lower food prices; better strategic planning and execution; and efficiency. Indonesia could also start to

give full attentions to agribusiness company, example farm equipment manufacturers, pesticide and fertilizer suppliers, and also Research and Development (R&D) which is a vital part of the agricultural industry.

In conclusion, Agribusiness or the business sector in Indonesia, especially, in fact have so many chances to be developed upon this country, Indonesia. The country can maximize the opportunities and connecting the agribusiness with modern technology such as robots and GPS. Although there may be challenges but it should be just done if we develop agribusiness with the right manners.

REFERENCES

Agribusiness development and trade - Knowledge Portal. (2020, November 25). Food & Business Knowledge Platform. https://knowledge4food.net/knowledge-portal/agribusiness-development-and-trade/

Ares, S. P. (2021, June 7). *What is agribusiness and why is it important?* NEWS BBVA. https://www.bbva.com/en/sustainability/what-is-agribusiness-and-why-is-it-important/

Chen, J. (2021, March 15). Agribusiness Definition. Investopedia. https://www.investopedia.com/terms/a/agribusiness.asp

Mariyono, J. (2019). Improvement of economic and sustainability performance of agribusiness management using ecological technologies in Indonesia. *International Journal of Productivity and Performance Management*, *69*(5), 989–1008. https://doi.org/10.1108/ijppm-01-2019-0036

Soetriono, S., Soejono, D., Hani, E. S., Suwandari, A., & Narmaditya, B. S. (2020). Challenges and Opportunities for Agribusiness Development: Lesson from Indonesia. The Journal of Asian Finance, Economics and Business, 7(9), 791–800. https://doi.org/10.13106/jafeb.2020.vol7.no9.791.

Human Resources, Change Management and Innovation

NO. Registration: 069/SEC/I/9/21

Managing Distress Toward Eustress For Improving Human Resource Performance

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The COVID-19 pandemic is an additional challenge for various industrial sectors in Indonesia (Affandi et al., 2020), including the Agri Food sector which is one of the essential sectors that must continue to operate to meet the food needs of the market. In this condition, the Agri Food businesses must create an effective strategy in managing its human resources so they can continue to operate in view of the health risks posed by the COVID-19 pandemic.

It is a heavy pressure for employees in carrying out work activities in the face of dynamic business conditions and the global pandemic outbreak. There are numerous experiences of excessive stress as a result of a prolonged pandemic. The stress they experience arises because working conditions have drastically changed, which requires them to work from home with almost unchanged work pressure (Galanti et al., 2021). This has an impact on the psychological condition of the employees which ultimately leads to a decrease in performance capabilities. The results of the PPM Management survey stated that around 80% of employees

experienced stress during the COVID-19 pandemic (Karunia, 2020). In addition to work pressure, the stress experienced by employees can also be triggered by health risks caused by the pandemic, as employees are experiencing deterioration in their focus, resulting in lesser production.

Through this, the researchers found that issues pertaining to mental health were present during this time of the pandemic. Aside from the researchers conducted during this time, all of could only attest to the incapacities it has brought upon our respective work dynamics. A large pressure during these trying times can only be classified as stress. With this, the group found that there are numerous ways in order to address the negative impacts of stress. Throughout this study, we found numerous ways in order for the agri-food industry to become much more resilient in the face of stress through proper treatment of its employees, stable work environments, and a hospitable means for more sustainable company management.

It is important for us to know that psychological distress in a number of literatures do not always cause a negative impact, especially regarding the issue of individual performance achievements (Bienertova-vasku et al., 2020). According to experts, distress can also be converted to positive stress if it can be managed optimally. This could bring benefits according to some experts through what they call Eustress or positive stress. Eustress, according to experts, can stimulate individuals to feel happy or motivated (Bienertova-vasku et al., 2020). This could potentially create a driving force to those experiencing them, producing better focus, more positive emotions, and better work output.

Eustress generally has similarities with negative stress conditions. It is not only formed due to individual personal impulses, it can actually be formed through a stimulus from external parties including relatives, co-workers, leaders, and organizations. Negative stress, when one is able to control it, can be done through reinforcing that the stress they are currently experiencing is the first step to prove their abilities to

the leaders and organizations they work in. This could be seen when leaders provide appreciation in the form of incentives. The negative stress condition transforms into a positive stress condition modified into motivation and enthusiasm for the individual to complete the task. The motivation and enthusiasm the workers shall produce, shall reap much better results leading to increased performance (Regina et al., 2021). This is shown through Figure 1.

Figure 1 *Model Managing Stress toward Eustress for Improving Human Resource Performance*

There are a number of steps that individuals, leaders, and organizations can take in order to manage stress effectively turning it into eustress. The steps in question include a.) employee engagement with the organization, b.) designing a performance-based compensation system, and c.) creating a conducive work climate (Carpenter & Tabei, 2020; Park & Jeong, 2020; Teo et al., 2019). Engagement is a manifestation of the nature of the relationship between the organization and its employees. Workers with high engagement tend to have a high concern for the sustainability of the organization as they tend to think the organization is a part of themselves resulting in them displaying optimal efforts in every task they are assigned to solely for the betterment of the organization. Furthermore, a good compensation system can be based on individual performance. In this context, compensation can be a stimulus tool to encourage employees to be more productive. Workers will show their best efforts to produce optimal performance in order to gain compensation. This causes employees to perform better under various conditions, including when faced with work pressure, with the incentives becoming a motivation to complete their tasks in the best possible way. Finally, a conducive work climate can lead to a better emotional state, making the level of work pressure lighter, so members of the organization can cope with working conditions that cause stress.

Another aspect that can be considered is to introduce a new policy to support workers through policies that specifically cater to their needs during these trying times. The idea behind the policy is to improve stress management within workers that are directly affected by them. An example of this is providing emergency benefits for workers. Hundreds of millions of private-sector workers are not being provided even a single paid sick leave. While among those who are, the vast majority of them do not have enough paid sick leave to quarantine for the minimum 14 days to recover from COVID-19. Others must accrue paid sick time and may not have the necessary available quantity on hand. With this, companies must provide their workers with at least 80 hours of paid sick time during this pandemic; and shall create a framework in which they are provided the necessary tools to recover from pandemics hereon. Paid sick leaves should be quantified using the necessary time needed to recover from such illnesses. This time should be pro-rated for part-time and contract employees, and must be usable for all pandemic related purposes, including but not limited to:

1. A worker who is exhibiting symptoms of the COVID-19 and future pandemics, and is seeking testing, treatment, or is recovering from it.
2. A worker self-quarantining due to possible COVID-19 and future pandemic exposure and were advised to quarantine; and
3. A worker that is responsible for their family, or household members because their school, childcare, or other care providers are closed or unavailable due to the public health emergency.

Having paid sick leaves results in workers feeling appreciated by their companies while they are stressed with the current situation they are dealing with. This possible sympathetic action by a company begets a beneficial stress to the workers.

Lastly, Generation Z are currently composed of those in their early twenties and early teens, implying that a large majority are currently looking for entry-level jobs with hourly compensations. This could be capitalized by businesses in the fast-food, home health care, retail industries, and the like, to rely on young and enthusiastic workers.

With this, companies should create frameworks that ensure the satisfaction of their workers through generational-based (Generation X, Y, and Z) data gathering methods to ensure the satisfaction of all workers in the company. Each generation has different characteristics resulting in different perspectives on threats. This is a tip to managing Gen Z in the workplace.

Like other generations before it, members of the Gen Z also want to work for companies that foster favorable corporate cultures, leading to increased productivity, increased team morale, and employee engagement. Thus, this generation-based framework could be used to know a company's culture, solicit input on the improvement of the management systems, the promotion of diversification, and the acknowledgement of each worker's output.

As a summary, the group uses three frameworks, all of which are umbrellas to numerous plans of action that ensure that stress is converted into eustress for all of our employees in the agri-food sector. Firstly, the Utilization of Eustress to ensure through employee engagement with the Organization, a performance-based compensation system, and creating a work environment that is conducive to all of the workers. These methods are to be used to ensure that the workers are more motivated to produce for the agri-food market, as well as to provide security for their mental health; that their employers are ensuring that they are not feeling any signs of negative stress. The next one is a Policy on sick leave that creates a framework in increasing the amount of hours that an employee has on sick leaves during public health crises. Through this, we are able to assure that the workers are also being provided sufficient time to recover

after being caught in the middle of the crisis. Lastly, acknowledging the difference between the stress that generations suffer, the Generation Based-Management framework ensures that the companies are able to convert stress into eustress in a more micro-scale method. All of these methods are ways in order for the employees to feel that they are being taken care of and that their efforts are leading somewhere; a large requisite to converting stress, into eustress.

REFERENCES

Affandi, A., Sobarna, A., Erlangga, H., Siagian, A. O., Purwanto, A., & Effendy, A. A. (2020). Optimization of MSMEs Empowerment in Facing Competition in the Global Market during the COVID-19 Pandemic Time. *Systematic Reviews in Pharmacy*, *11*(11), 1506–1515.

Bienertova-vasku, J., Lenart, P., & Scheringer, M. (2020). Eustress and Distress: Neither Good Nor Bad, but Rather the Same? *Bioessays*, *42*(7), 1–5. https://doi.org/10.1002/bies.201900238

Carpenter, K., & Tabei, A. (2020). On Residual Stress Development, Prevention, and Compensation in Metal Additive Manufacturing. *Materials*, *13*(2), 255.

Galanti, T., Guidetti, G., Mazzei, E., Zappala, S., & Toscano, F. (2021). Work From Home During the COVID-19 Outbreak. *Journal of Occupational and Environmental Medicine*, *63*(7), 426–432. https://doi.org/10.1097/JOM.0000000000002236

Karunia, A. M. (2020). Survei PPM Manajemen: 80 Persen Pekerja Mengalami gejala Stres Karena Khawatir Kesehatan. *Kompas.Com*, 1.

Park, S., & Jeong, M. A. (2020). The Effects of Work Environment Area on Job Stress and Heart Rate Variability-Focused on the Forest and City Area. *Biomedical Journal of Scientific & Technical Research*, *31*(15), 24459–24466. https://doi.org/10.26717/BJSTR.2020.31.005154

Regina, M., Brandão, F., Polito, L. F., Hernandes, V., Correa, M., Mastrocola, A. P., Oliveira, D., Oliveira, A., Moura, L., Villas, M., Junior, B., & Angelo, D. (2021). Stressors in Indoor and Field Brazilian Soccer: Are They Perceived as a Distress or Eustress? *Frontiers in Psychology*, *12*, 1–15. https://doi.org/10.3389/fpsyg.2021.623719

Teo, S. T. T., Bentley, T., & Nguyen, D. (2019). Psychosocial work environment, work engagement, and employee commitment: A moderated, mediation model. *International Journal of Hospitality Management*, *88*, 102415. https://doi.org/10.1016/j.ijhm.2019.102415.

NO. Registration: 014/SEC/I/9/21

Responses to COVID-19 For Sustainable Agriculture Transformation: Change Management and Innovation in The Agricultural-Food Sector

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The COVID-19 pandemic has affected the global rural economy by disrupting the means and ways of agricultural production. The restrictions on mobility alone greatly impacted the process of harvesting crops, and border limitations have made it difficult for countries to import and export staple food such as rice. Not only did COVID-19 expose the gaps in our public healthcare systems, but it also exacerbated the challenges in our agricultural food sector that governments have yet to address.

This paper explores the current context of agriculture in Southeast Asian economies while identifying the possible innovations that could be adapted for sustainable agricultural development. This study argues the importance of local change management in transforming agricultural food systems. Contextualized solutions must be applied for practical innovations to happen. All stakeholders who benefit from agricultural food production must be involved.

Agricultural Food Sector in Southeast Asia

The rise of the Southeast Asian population is directly related to the region's economic development. Free trade, direct foreign investments, and regional integration account for the productivity growth of member states (Asian Development Bank, 2000). Naturally, as demographic rates rise, so does the demand for food staples, whether organic or processed.

The Southeast Asian food market now faces a challenge on food security and agricultural productivity. According to the International Food Policy Research Institute (IFPRI), factors such as the degradation of natural resources, urbanization, and climate change have contributed to the region's vulnerability to food insecurity (2019). In addition, the COVID-19 pandemic introduced high levels of poverty in vulnerable segments of the population. A policy briefing in 2020 by the United Nations revealed that due to policy lockdowns and quarantine measures, Southeast Asian countries dependent on trade and merchandise would suffer economic losses. The rise of unemployment also means the decline of labor productivity, affecting how we consume and produce food.

Regional governments must implement change management and innovation for Southeast Asian economies to thrive in agricultural-food sectors in the post-COVID-19 era. Such change must involve the sustainability of rural policies as well as the collaboration of all stakeholders involved. Moreover, robust urban development must be included to preserve the natural resources necessary for produce to thrive.

Key Stakeholders Involved

The agricultural supply chain involves both internal and external stakeholders. In the context of the farm food sector, five influential stakeholders are included.

Farmers - If agriculture had a body, farmers would comprise 90% of it. Without farmers, agricultural food systems would suffer. Although technological advancements have introduced machinery that makes plowing and harvesting more efficient, farmers bridge the gap from producer to consumer.

Agricultural service providers - Without institutions that support agricultural services, farmers struggle to bring their harvest to more tables. Second and third-party providers make agricultural food products accessible and scalable to consumers.

Consumer packaged goods companies - Packaged goods companies make food more practical to consumers. By packaging goods in different quantities, agricultural produce is now more consumer-friendly.

Distributors and retailers - Distributors and retailers promote food accessibility. Sustainable development must also recognize the realities that commercialized agricultural products are not readily available in rural areas. This is where the role of distributors and retailers comes in.

Consumers - Consumers dictate market trends and demands. During the pandemic, economical rates fluctuate depending on the restrictions on mobility and employment. The more purchasing power the workforce has, the higher chance of agricultural sectors to thrive.

Consumer Role in Sustainable Agri-Food Transformation

The role of consumers is pivotal in the sustainable development of agricultural economies. In Southeast Asia, the demand for food security is high following the rise in COVID-19 cases. Organic agrarian food production is needed to supply the natural food products that help strengthen one's immune system. Consumers have the agency to transform agri-food processes by demanding local governments to impose flexible policies on labor and mobility service providers.

Farmers fall under this category and thus allows them to produce crops for import and export. Moreover, consumers should also be critical of how agri-food is packaged. Sustainable agricultural development does not only involve the way agriculture is sourced but also in how it is presented. The consequences of climate change directly affect agrarian systems, which is why distributors and companies should ethically package agricultural products. Consumers have the responsibility to demand what practices producers should adhere to.

In conclusion, sustainable agriculture transformation requires a multidisciplinary approach from all stakeholders involved. In the post-COVID-19 era, Southeast Asian economies must pivot to a sustainable way of ethically producing and packaging agricultural products. Farmers should also be the main beneficiary of local government policies in favor of agricultural production. Lastly, contextual agrarian reforms must be made to address the varied challenges of Southeast Asia in response to the implications of the COVID-19 pandemic.

RESOURCES

Hossain, S. T. (2020). Impacts of COVID-19 on the Agri-food Sector: Food Security Policies of Asian Productivity Organization Members. *Journal of Agricultural Sciences – Sri Lanka*, *15*(2), 116. https://doi.org/10.4038/jas.v15i2.8794

Takeshima, H., & Joshi, P. (2019). Overview of the agricultural modernization in Southeast Asia. *International Food Policy Research Institute*. Published.

United Nations. (2020). *Policy Brief: The Impact of COVID-19 on South-East Asia*.https://www.unescap.org/sites/default/d8files/2020-07/SG-Policy-brief-COVID-19-and-South-East-Asia-30-July-2020.

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Transforming The Traditional: How Philippine Agriculture Faced Contemporary Challenges in The Year 2020 and Beyond

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Since the pandemic began, its effects have been inflicting communities - all aspects of its mere existence. Consequently, the agriculture industry is one of the most affected since the lockdown and restrictions started. In fact, it is more difficult to witness and imagine the extent the Filipino farmers have to endure in order to survive this “far from over” global crisis.

Item	2016	2017	2018	2019R	2020
GNI (million pesos)	17,862,678	19,084,224	20,212,349	21,299,032	18,867,410
Growth Rate (%)	6.8	6.8	5.9	5.4	-11.4
GDP (million pesos)	16,062,676	17,175,978	18,265,190	19,382,751	17,527,234
Growth Rate (%)	7.1	6.9	6.3	6.1	-9.6
GVA in Agriculture, Forestry, and Fishing (million pesos)	1,672,085	1,743,134	1,762,616	1,783,855	1,780,544
Growth Rate (%)	-1.0	4.2	1.1	1.2	-0.2
Share to GDP (%)	10.4	10.1	9.7	9.2	10.2
Agriculture, Forestry, and Fishing	-1.0	4.2	1.1	1.2	-0.2
Crops	-3.2	4.7	-0.7	-2.0	1.5
Livestock	3.0	3.4	3.7	-0.8	-6.9
Poultry and egg production	1.8	5.0	5.3	5.8	-2.4
Other animal production	5.3	6.4	9.3	31.8	-3.2
Forestry and logging	-4.3	-1.4	22.9	5.0	-4.3
Fishing and aquaculture	-1.0	2.1	-0.6	2.5	-1.3
Support activities to agriculture, forestry, and fishing	2.9	4.7	3.4	5.8	5.0

Source: PSA

Considering that the agricultural sector comprises 40% of the Filipino labor force, contributes an average of 20% in the Philippine economy and more importantly, forms the basis of all the food consumed by every citizen. However important it seems as a basic need for Filipinos, it is still a harsh reality that it has an underwhelming growth as seen in Table 1 which shows that the growth value added of the agriculture sector posted a -0.2 decrease in the year 2020 alone.

The displeasing decline in terms of agricultural share to GDP could be deemed from the outbreak of Covid directly limiting mobilization and trade and the preoccupation of the government towards issues such as eradicating the illegal drug trade which could not seem to be eliminated despite the extra-judicial killings that had been rampant since pre-pandemic. Moreover, the corruption from politicians continues to flourish day by day. Take note that these are just few of the apparent issues the government is resolving before taking action about agricultural problems. On the other hand, the prevalence of poverty among farmers, and the concerning decline of interest among youth towards farming made the condition of Philippine agriculture in a more aggravating position even before the pandemic

But in spite of this issue, it is still important to note the initiatives the local governing bodies mandated in order to suffice the imperative demand of the agricultural sector in these trying times. According to the Philippine agriculture secretary, *"Our vision is a food-secure and resilient Philippines with prosperous farmers and fisher folk."* This effort and initiative require a lot of commitments and support from major agricultural stakeholders. We could not risk another crisis unprepared as it already affected not only the economy but also the lives of our farmers, the ones who do the backbreaking work all day long and the ones who provide us food to eat.

Food Resiliency Action Plan

Following the implementation of nationwide lockdowns and quarantines, the Department of Agriculture (DA) immediately implemented the Food Resiliency Action Plan to make sure that there will be a stable and sufficient supply of basic agricultural commodities for the rural and urban areas across the country. Agricultural products were strategically prepositioned to suffice the needs during the Covid-19 outbreak.

"Suggested Retail Price" management

The DA also created the *Bantay Presyo Task Force* to make sure that the prices of the basic commodities follows the Suggested Retail Price policy and were not violated by hoarders, cartels and profiteers. This is to ensure that everyone has equal opportunity in acquiring food supply during this global crisis.

The DA is not only implementing policies that protect the consumers. The goal is to create an inclusive system that promotes equality among the consumers while at the same time protecting the rights of the backbone of our society, which are the farmers.

"Kadiwa ni Ani at Kita"

This project stands for ***"Katuwang sa Diwa at Gawa para sa Masaganang Ani at Mataas na Kita"*** which is a marketing strategy by the Agriculture Department of the Philippines to serve as the direct channel for easier and direct transactions between local farmers and consumers.

Because of this, farmers would benefit as the costs for logistics will be much lower. This will also make sure that the local products will not be wasted because this program will ensure that the commodities will be allocated to different local government units (LGUs) across the country.

Agricultural Credit and Policy Council (ACPC)

Because of the disrupted agricultural business and farms, the DA also responded to the financial needs of small scale farmers, fishers and micro scale agricultural businesses. The objective is to empower the local agricultural entrepreneurs and farmers to continue what they are doing because they play a vital role in our society and the people and the government are always ready to help and support them specially during this difficult period for everyone. Under this initiative, two credit programs were introduced to help the struggling farmers.

1. **Kapital Access for Young Entrepreneurs (KAYA)** – that motivates the youth to launch a start-up that supports agriculture by providing them the initial capital requirements.
2. **AgriNegosyo Loan Program-** supports the small farmers and fishers by providing them the capital for production, processes, and marketing their products.

ACPC also launched the **SURE COVID-19** to help the businesses that were affected by the pandemic. The following programs released a total of 2.03 billion pesos (41M USD) in support for small businesses and farmers. Aside from this, 444.30 million pesos (8.91M USD) to help the farmers recover from the impacts of the pandemic and other contemporary problems such as the typhoons, volcanic eruptions and the African swine flu.

Considering the agricultural sector as one of the robust contributors in the Philippine economy, the DA could do more if allocated a much higher and sufficient budget for Agricultural projects and activities because compared to its neighboring ASEAN countries, the Philippines receives the lowest share in agriculture from the national budget. (See Table 2)

Table 2 Agricultural share from the National Budget

Philippines	**1.7%**
Vietnam	6.5%
Indonesia	3.4%
Thailand	3.6%

Given this present situation, it is more than critical to perceive things in different perspectives and start asking questions like "What can we do?" and "How can we help?".

As the world transitions into the "new normal", we should remain committed to lessons learned in the past with better and smarter guidance and support, in order to achieve the overall success of productivity of this sector. I believe that if we all work together, a food secure and resilient Philippines with successful and prosperous farmers is not too far in the future.

REFERENCES

Abesamis, T. S. (2019, April 23). Underrated crisis in agriculture and fisheries. Retrieved September 04, 2021, from https://www.bworldonline.com/underrated-crisis-in-agriculture-and-fisherie

Beverly, B. (2021, May 19). Grameen foundation. The Continuing Toll of the COVID-19 Pandemic on Farmers in the Philippines. https://grameenfoundation.org/stories/blog/the-continuing-toll-of-the-covid-19-pandemic-on-farmers-in-the-philippines.

Department of Agriculture. (2020). 2020 Year-end Report. Department of Agriculture.

Habacon, J. P. P. (2021, March 12). [OPINION] why Filipino farmers suffer. Rappler. https://www.rappler.com/voices/ispeak/opinion-why-filipino-farmers-suffer.

Philippine Statistics Office. (2021). 2020 Selected Statistics on Agriculture.

World Bank. (2021, September 9). Transforming Philippine Agriculture: During Covid-19 and Beyond (June 2020) - Philippines. Relief Web. https://reliefweb.int/report/philippines/transforming-philippine agriculture-during-covid-19-and beyond-june 2020?fbclid=IwAR2vL-8ziWnPFNqhyMLqYDxA8RRbEvCnFsqq85ltXoy8Oe26sYzM92wW28.

Sustainable Food Production

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Sustainable Food Production Strategy to Overcome Covid-19

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Sustainable food production is a production method that uses non-polluting processes and systems, utilizes renewable energy with natural resources, is economically efficient, safe for workers, communities and consumers, and does not threaten the needs of future generations. In 2050, the world population is predicted to reach 9.1 inhabitants. This number is 34% larger than the current population. Therefore, food production must increase by up to 70% in order for future populations to survive. As already mentioned, to achieve sustainable food production, it means that more food must be produced using less land. One of the other challenges is that there is a need for nutritious food in food processing so that people can consume nutritious food.

Food production goes hand in hand with food security. Food production discusses the method of food production and food security talks the condition of the fulfillment of food for the state to individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with religion, beliefs, and community culture to be able to live a healthy, active and productive life in a sustainable manner. The issue of food security is important to pay attention to, because one of the country's development factors depends on food security. Several dimensions of food security are:

1. **Food availability**, namely food production originating from within the country, and from imports if domestic production is insufficient, food availability between time and between regions, food reservation, trade processes and food distribution.
2. **Food accessibility**, that is food access, people's purchasing's ability, especially the poor and marginalized including subsidies to maintain and improve food access and food price stability factors that greatly affect accessibility.
3. **Food utility**, namely the consumption and utilization of food, especially regarding nutritional quality, content of macronutrient carbohydrates, processing and industrial processes, wholeness, and others.

From the indicators above, it is concluded that in realizing good food security, food production must be carried out with minimal constraints. Common constraints that commonly affect food production include:

1. Land Narrowing: Many growing industries which results in large-scale land conversion. This can be overcome with permission to take over functions with a more stringent system.
2. Rising prices for production inputs: Farmers' hard work becomes difficult to pay off because if inputs such as fertilizers, seeds, agricultural equipment and irrigation prices increase, the value of their business outputs will not match expectations. This is usually overcome by the operation of the production input market and the provision of subsidies/semi subsidies from the government.

Unfortunately, in 2020 there were more constraints on food production due to the Covid-19 pandemic. Because not only the economic sector, but the pandemic also affects the agricultural and food sectors. Agricultural productivity has decreased drastically due to several factors such as the average age of farmers who are old so they are vulnerable to the Covid-19

virus, farmers' education is lacking in dealing with the Covid-19 virus, such as the importance of washing hands and maintaining cleanliness. In addition, many employees of transportation services have been fired, so that the distribution and transportation of food is hampered. As a result, supply is insufficient and demand by the community cannot be met, thus affecting the average price of food commodities. Some of the world's food commodities whose prices have increased are vegetable oils, meat, sugar, cereals, and milk. Based on the increase in the Food and Agriculture Organization (FAO) food index, the cereal price index increased 6% in April 2020 due to corn prices, although corn and wheat prices weakened, rice prices remained stable. Furthermore, the vegetable oil price index rose 7.8% driven by demand, the sugar price index rose 6.8% due to harvest delays. In addition, the FAO meat price index rose by 2.2% and the milk price index rose 1.8%.

Not only rising prices, unemployment and poverty also increased quite high. In Indonesia alone, unemployment due to the pandemic is estimated to reach 2.92 million people in the worst scenario and 5.23 million people in the worst scenario. The poverty rate in 2020 also rose to 26.42 million people (9.78 percent of the total population). The government's poverty alleviation program in recent years as if it has just disappeared.

Some policy recommendations that can be offered for this problem are as follows:

1. Farmers receive adequate intensive assistance in carrying out their productivity. In the case of this pandemic, poor farmers can take advantage of village funds through labor-intensive programs and optimize existing fertilizer and seed subsidy programs. The expected output is that farmers are able to pick their crops at a reasonable purchase price.

2. There is an agricultural technology extension program from students. The government can offer extension programs with large credit rewards to attract students to the program.
3. Good rice logistics system so that the flow of rice trade is not disrupted. Rice is emphasized because of its large socio-economic-political impact, especially in Southeast Asian countries. Factors that are improved are distribution guarantees, subsidies for food fleet transportation costs.
4. Emphasis and reallocation of the Regional Development and Expenditure Budget (APBD) to mitigate the food security crisis, especially during this critical pandemic period. Local and provincial governments can work together to protect community and volunteer movements to anticipate food crises.
5. Improvement of food distribution and supply in deficit areas by involving the Community Association, Family Welfare Education, and community leaders such as public figures.
6. Financing for agricultural development, restructuring of farmer debt, developing Tangguh agriculture, modern biotech, precision agriculture, urban farming development, and others.
7. Lastly, investment in human capital in agriculture and animal husbandry, namely those that can achieve rapid technological changes, especially agriculture 4.0. This is done for the advancement of human resources of farmers.

REFERENCES

https://www.eufic.org/en/food-production/article/food-production-3-3-a-sustainable-foodsupply#:~:text=Sustainable%20food%20production%20is%20%E2%8%9Ca,the%20needs%20of%20future%20generations%E2%80%9D.

https://www.kompasiana.com/sae/56ca7a6cae7e6119229c1491/2-hambatan-utama-produksi-pangan.

http://sdgcenter.unpad.ac.id/strategi-ekonomi-sektor-pertanian-di-tengah-pandemi-covid-19/.

Kasyaf (2020). *Jurnal Populer Pemikiran Ekonomi Islam.* **(**Page 35-40).

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Covid-19 Pandemic: Exposed Vulnerability in The Already Stressful Rice Production System in Southeast Asia and Suggested Solutions

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Agriculture and food production is a key factor in Southeast Asia. The United Nations' Food and Agriculture Organization (FAO) highlights that in 2016, Southeast Asia accounts for 35 % of the world and 47% in Asia in terms of the values of the total rice export production. Despite Southeast Asia's importance in the field of rice production, the region is still left with various challenges that face the industry including: labor and input shortages and the disrupted supply chain in the region that further affects the food security and nutrition in the region. The International Rice Research Institute (2018) emphasizes that rice is the most vital staple food in the region accounting for 50% of the calorie intake of the region's population. Given this, rice plays a major role in maintaining food security and nutrition for its population. However, the existing challenges in the region are further exacerbated by the COVID-19 pandemic. Lockdowns and trade restrictions brought by the COVID-19

pandemic in various parts of the region have pushed rice into the limelight of possible instability in both production and costs, worsening the existing issues of the agricultural rice production in Southeast Asia.

Labour Scarcity

The COVID-19 pandemic has intensified the socioeconomic vulnerability of people whose mobility restrictions have been amplified. The restriction in human mobility affects cross-border movements nationally and internationally. This includes the seasonal and temporary migration of labour forces (Benton, 2021). As a result of the enforcement of community lockdowns, farm labour is reduced in quantity, resulting in a drop in overall agricultural output (Gregorio, 2020). The need to fill labour gaps is of importance as to maintain the enormous scale of rice production systems beginning with the production of paddy itself. However, there are still risks held with increased movement of labour forces such as infection risks at farms and in processing and packaging facilities (Kim, 2020). Paddy production being a labour-intensive food crop has always been faced with labour force shortages and it has become an increasingly challenging issue now.

Water scarcity

Water is an integral component for domestic uses and many economic sectors. This includes agricultural systems, especially paddy cultivation which require a relatively high amount of water use compared to most crops. Water management can increase the productivity level for crops to reach their full genetic potential while directly increasing the income of farmers. However, water can be managed if only there is any water left to be managed. Droughts have hit the Lower Mekong River basin (LMB) in recent decades, inflicting significant economic losses and food

security issues. With Covid-19, awareness programs on the emphasis of washing hands, accompanied by droughts raises issues with access to clean water for rural areas let alone access for farmland irrigation.

Food security

Food security is measured in its 3 pillars which are food availability, access and utilization (Gregorio G., 2020). Southeast Asia has 61 million undernourished individuals, or around 9% of the population, with over 33 million suffering from extreme food insecurity (Southeast Asia. (n.d.)). Food security is governed by multiple factors with complex interactions between them. The aim in agriculture should not just be towards increasing food production but to improve nutritional status of the population. Rice is a staple food for many Southeast Asian countries which contain micronutrients which can prevent 'hidden hunger' and stunting in children of poor communities. Due to the pandemic, export restrictions have been placed on rice causing higher prices of these crops relative to others. This causes increased vulnerability of countries dependent on imports and to the poor communities.

Disruption in the Rice Supply Chain

Lockdowns and quarantine restrictions induced by the COVID-19 pandemic have disrupted the rice supply chain in Southeast Asia. This is due to limited mobility, labor shortage, the lack of access to input and output markets, and government actions and restrictions to combat COVID-19. The disruption of the rice supply chain can have a significant impact on food supply, consumption, and nutrition consequences. The limited mobility brought about by quarantine restrictions and lockdown measures impeded logistics of transferring and exporting rice from producers to the market, causing spoilage of products for the producers and shortage of products in the market. With the growing demand for food, the inability of producers to bring their products to the consumers caused the disruption on demand chain.

However, the challenges of efficiency in logistics and poor management in rice production have already long existed in Southeast Asia leading to the loss and spoilage of rice. Specifically, in the Philippines, 500, 000 tonnes of rice were rotting in government warehouses due to poor management in 2011 (Chng, 2013). This is also evident in the biggest rice exporter in Southeast Asia, Vietnam that has poor logistics management and trade activities (Vietnam Credit, 2016). As Yong and Nee (2008) highlights, a successful supply chain is dependent on the ability to establish compatible logistics, connecting and managing the rice supply chain from "farm to table." This involves getting individuals along the supply chain to cooperate, collaborate, and work together. Therefore, to improve food security in the region, addressing the issues in the rice supply chain is necessary.

There is a quote which says "If you do not focus on the solution, you will be lost in the problem." Therefore, there are certain suggested methods to overcome these labour shortages issues. As seen in paddy fields, labour forces are mostly used for activities such as transplanting seedlings, culling of unfavourable plants, weeding, fertilisation, harvesting and post-harvest activities. A method which can be suggested is an increase in a degree of mechaniaation for tasks which do not require specialised skills. By strengthening research and developments through incentives and involvement of various disciplines such as engineering and information technology forces, it can drive the development of machineries for the use of these activities. Unmanned Aerial Vehicles (UAV) also known as drones hold

the potential to assist farmers in paddy production as well. Accessory equipment with sensors developed for tasks such as fertiliser application can be used towards a more precise and sustainable manner of fertilising paddy fields.

Through a variety of ways to enhance the skill levels of rural labor, we should strengthen the professional skills training of agricultural workers, establish organizations, workers, workers training classes, etc., which can strengthen the quality of workers to reduce corporate cost. This improves the social service platform to create a good employment environment. Developing township economics by strengthening factors such as employment benefits, medical accessibility, transportation accessibility and others in village areas can be empowering as they hold the potential to reduce urban and rural gaps reflecting on an increase of social fairness. This can remove negative perceptions of society towards farm related jobs and attract workers much more easily.

Effective water management is an integral idea for facing the challenge of water scarcity. Also, creative ways to obtain different sources of water to irrigate farms must be considered to reduce the pressure from the single water source relied on by everybody. With this in mind, governments could reasonably develop and extract groundwater, build reservoirs and regulate the time distribution of water resources. They can do this by opening channels to divert water and regulate the spatial distribution of water resources. Another technology to be considered is building seawater desalination plants to increase the number of water sources. Next, to improve the reuse rate of industrial water from factories to reduce primary water usage by them. Lastly, the International Rice Research Institute has developed drought-tolerant varieties which should be used to face water scarcity in regions affected by it.

The export restrictions on rice commodities caused by the pandemic are not happening for the first time. Export restrictions of rice from high producing countries have happened before and are a key factor in food insecurity. Current solutions by International Rice Research Institute, IRRI are by producing high-yielding paddy varieties and varieties

biofortified with Vitamin A and zinc. In addition to that, a solution accessible to farmers which can cause a revolution on how rice is produced must be done. Extension services which provide online services for farmers to gain knowledge on matters such as crop production modelling, which allow farmers to use data of the local weather, geography and other key factors to come up with a sustainable production system. This ensures consistent production throughout the year without any unexpected losses.

As Southeast Asia relies on rice for food security in the region, an efficient rice production system is important to overcome hunger and malnutrition in the region. There are several strategies that can be taken during the Covid-19 pandemic to maintain the availability of the rice supply chain, namely by maintaining the stabilization of food crop production by providing production input supply assistance and assistance with agricultural equipment; make a mapping of planting and harvesting schedules with the aim of facilitating distribution channels from areas that have excessive food production to areas that lack or need food. In addition, as paddy is prone to spoilage, shortening the lead time from farm to mill will minimize post-harvest losses. In a pandemic like this, we also need to prepare a harvest fleet and a safe and fast food product distribution system in accordance with health protocols.

However, addressing this not only means coming up with innovative solutions, but requires the involvement of the local government and the international community (e.g. ASEAN and IRRI) to make sure that these do not just stay as plans and proposals but are materialized and operationalized. Thus, this necessitates a strong collaboration of various countries and organizations in the agri-food supply chain to promote, adopt, and innovate the rice production system in order to bring rice from “farm to the table.”

REFERENCES

Benton, M., Batalova, J., Davidoff-Gore, S., & Schmidt, T. (2021). *COVID-19 and the State of Global Mobility in 2020*. Migration Policy Institute and International Organization for Migration.

FAO (Food and Agriculture Organization of the United Nations). 2016. FAOSTAT database. http://faostat.fao.org

Gregorio, G., & Ancog, R. (2020). Assessing the Impact of the COVID-19 Pandemic on Agricultural Production in Southeast Asia: Toward Transformative Change in Agricultural Food System. *Asian Journal of Agriculture and Development*, *17*(1), 1–14. https://doi.org/10.37801/ajad2020.17.1.1

https://publications.iom.int/system/files/pdf/covid-19-and-the-state-of-global.pdf Chng, D. (2013). Southeast Asia's Food Security Challenge: More than 'Stock' Solution Needed. *Nanyang Technological University.* Retrieved from,

https://reliefweb.int/report/world/southeast-asia's-food-security-challenge-more-'stock'-solution-needed

International Rice Research Institute (2018). Transitioning toward equitable, profitable, and environmentally sound rice agri-food systems. Retrieved from, https://www.irri.org/where-we-work/countries/southeast-asia

Kim, K. (2020, July 17). *Food Security in Asia and the Pacific amid the COVID-19 Pandemic*. Asian Development Bank. https://www.adb.org/publications/food-security-asia-pacific-covid-19

Southeast Asia. (n.d.). International Rice Research Institute. Retrieved September 20, 2021, from https://www.irri.org/where-we-work/countries/southeast-asia

Vietnam Credit (2019). Vietnam Logistics Industry: Risks and Challenges. Retrieved from, https://vietnamcredit.com.vn/news/vietnam-logistics-industry-risks-and-challenges_1 3632

Yong, A. & Nee, H. (2008). Supply Chain Model for Rice in Malaysia - Basics and Challenges.

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Pandemic Covid 19 Crisis: Ongoing Challenges or Subsectors in the Agro-Food Industry in Malaysia

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Food is like bread and butter; either eat food for live or live to eat food, food is a basic thing that we need to survive. Currently, Malaysia is facing a Covid 19 pandemic crisis which has affected most of all sectors in this country. Agro-food industry was also no exception affected by this crisis, notably during the first movement control order (MCO) was implemented on 18th March 2020 until 30th March 2020. Unfortunately, within two weeks of MCO, Malaysia was seen as failing to curb Covid 19 pandemic transmission and decided to extend the period of MCO until April 14, 2020 and it was continued until the end of the year. Year 2020 was a severe test field for Malaysia when people were restricted to going out from home within the MCO period except for essential workers, unless to shop for groceries or to get medical treatment in a hospital or clinic. Farmers and mostly rural gardeners community in Malaysia were unable to sell their crops, therefore dumping of crops increased and supermarkets in town facing the reduction of agro-based food suppliers. Hence, Malaysia plans foremost efforts to overcome the shortage of food supply and the surge of agriculture crops in the hinterland area.

Subsectors in the agro-food industry in Malaysia are divided into two major subsectors; industry subsectors and food subsectors. Food subsectors are related to farming, crops, vegetables and fruits, livestock and fisheries. In this article, focus is on the field of farming and crops in

Malaysia. The first challenge faced in farming and crops is that there is no cycle for food commodities even though the demand is always constant in all situations. According to the Malaysian Government Statistical Census study, in 2018 before the covid 19 pandemic the percentage of food subsector contributed 1.14% to Gross Domestic Product (GDP), whereas the statistical data showed a significant increase in 2009 to 2017. However, Malaysia Agriculture and Food Industry (MAFI) reported that in 2020, the Global Food Security Index (GFSI) recorded out of 113 countries in the world, Malaysia ranked 43rd compared to 28th position in 2019, hence depict panic trigger especially emergence of covid-19 pandemic.

The challenges of the food sub -sector continue as land used for agriculture dwindles. The Malaysian construction industry is increasingly engaged in the construction of buildings such as offices, hotels, housing, shopping malls and other buildings in line with the demands of the development of industries that provide significant returns to the national economy. Malaysia is a country that has fertile soil; however, the agricultural land is nowadays used as a stone forest, therefore as a result, the country is at risk with an impact on national food security.

The agro-food industry in Malaysia is currently facing major challenges in crop food production when there is a shortage of manpower because of the covid-19 pandemic. In agriculture sector, foreign workforce are 132700 for male, while 23624 are female which come from various countries such as Indonesia, Nepal, Bangladesh, India, Myanmar, Philippines and other Asian countries. The statistical data generated up to February 2018 by the Malaysian Immigration Department gives a picture that the dependence of manpower from outside Malaysia is scarce. The closure of the border by the National Security Council (MKN) has reduced the entry of foreign workers to ensure the safety of the people from the spread of the covid-19 virus.

The Malaysian government is serious about the shortage of manpower in the agro-food industry. One of the initiatives implemented in this country is to encourage young people to become local entrepreneurs by following the agricultural sector programs provided by the Minister of Agriculture and Food Industry (MAFI) such as the Young Agropreneur Program, Agricultural Training Program and My Future Agro Program where this program provides opportunities for youths to be involved in agro-food industry and especially in the agricultural industry. The involvement of these young people can be a catalyst in the sustainability of food production in the country, guaranteed food security and the production of new technologies to increase agricultural yields in the country.

According to Statistics Malaysia data, the country is ranked 28th out of 113 countries in the Global Food Security Index in 2019. The recorded data shows that Malaysia is still dependent on food imports from abroad. Although Malaysia is located on the equator of the earth which promises fertile soil, does not experience four seasons where sun and rain are enough and complete facilities, unfortunately, the main foods in Malaysia are still imported such as vegetables, fruits, grains and rice. Therefore, the authorities such as the Ministry of Agriculture and Food Industry Malaysia (MAFI), especially in the Department of Agriculture need to actuate the workforce's energy, knowledge and technology to reduce the import rate of staple food for the people in this country.

To ensure the sustainability of food production in the country, all parties must work together to address this problem without pointing fingers at each other. As the younger generation, the responsibility to develop and modernize the agro-food industry in this country must be taken seriously from now on because we are the inheritors of the country and the leader of the country's pattern in the future. Future success is determined by diligent efforts starting from now.

REFERENCES

https://www.data.gov.my/data/ms_MY/dataset/statistik-pekerja-asing-terkini-mengikut-warganegara-dan-sektor/resource/f71dc85e-ba4e-49c1-bcbe-e0bc7e08c679.

http://www.doa.gov.my/index.php/pages/view/759.

https://www.mafi.gov.my/belanjawan-2021/

https://www.mida.gov.my/ms/industri/perkilangan/teknologi-makanan/

https://www.dosm.gov.my/v1/uploads/files/1_Articles_By_Themes/External_Sector/MTSR/Malayia_Trade_Statistics_Review_Vol-1-2020.pdf.

https://www.dosm.gov.my/v1/uploads/files/6_Newsletter/Newsletter%202020/DOSM_BPPAS_1-2020_Siri-18.pdf

https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=UXlFcW1pSnhhZUFSSTc0RDhnR3V3dz09.

https://www.data.gov.my/data/ms_MY/dataset/statistik-pekerja-asing-terkini-mengikut-warganegara-dan-sektor/resource/f71dc85e-ba4e-49c1-bcbe-e0bc7e08c679.

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Implementation Efforts in Maintaining The Security of Soybean Supply Chain in Indonesia

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After rice and corn, soybean is Indonesia's most important food crop. In Indonesia's farming system, soybean is a distinctive yet conflicting strategic commodity. Soybean planted area accounts for less than 5% of total food crop area, yet this commodity is at the center of all national food policy due to its critical significance in the population's diet.

Soybean is a commodity that is both vital and strategic, as well as having a high economic worth. Indonesia must import this soybean commodity since local output does not match home demand. Big steps must be taken because the growing dependence on imports can be a disaster, especially if world prices are very expensive due to declining stocks. Because the amount of demand is still more than the amount of output, soybean self-sufficiency has not yet been reached. As a result, soybean imports continue to rise year after year.

Food includes any agricultural, plantation, forestry, fisheries, water, and water products, both processed and unprocessed, that are utilized as food or beverages for human use. Humans are unaware of the importance of food sustainability and the link between eating healthily and living a long life. The capacity to maintain a balance in the environment, such as animals, plants, food, and farmworkers, is characterized as sustainability.

The food we eat and produce is affected by food sustainability. Making food more sustainable will have numerous positive effects on the community as well as on the environment. In general, food sovereignty is accomplished when the country's food security is ensured by supplying food from within the country rather than relying on outside sources.

Food practices in Indonesia are currently considered to be less sustainable. Because chemical farming techniques are sponsored by the government, food production facilities and infrastructure tend to be unsustainable and geared toward chemical farming practices rather than organic farming practices. As a result of the increased cost, organic farming will become less established.

Because the supply and distribution of food do not support the government's healthy eating habits program ("4 Sehat 5 Sempurna"), which is directed on the diversity of food kinds, it becomes ineffective.

In Indonesia, food production (including soybeans) is based on a free market process in theory. As a result, traders, as opposed to the government and families, have the greatest reserves. A country that can compete in the world market through exporting is one that can produce effectively.

Importing nations that can compete for products on the world market, on the other hand, are able to pay more or at least equal to international pricing. It indicates that in order to purchase goods on the international market, a country's citizens must have adequate purchasing power. When people's purchasing power is low, their capacity to buy imported food is likewise low, putting their food security at risk.

The answer is to use local production as a tool to enhance food security, rural development, and reduce import risk. As a growing country with a big population, Indonesia must avoid relying on imported soybeans since it has a number of hazards, including limited foreign exchange and supply and price volatility, which can jeopardize national food

security. The growing reliance on imports is extremely dangerous since it compromises national security and threatens social, economic, and political stability.

Soybean self-sufficiency necessitates hard effort, farmer stimulation, sufficient technology, farmer counseling, and support. The difficulty right now is in the market; farmers aren't enthusiastic about growing soybeans because they believe the international market is unfair. Farmers require stimulation in the form of a competitive price, which may be achieved by policy protection that favors farmers, resulting in competitive domestic pricing.

Alimoeso (2008) states that increasing soybean production can be done by:

1. expanding planted area,
2. increase productivity,
3. secure production and
4. strengthen institutions.

After that, there are development activities. Soybean commodity is a series of operations that must be integrated and coordinated in a synergistic manner from upstream to downstream, involving several stakeholders. Farmers will be enthusiastic in growing soybeans provided their operations are lucrative, prices are assured, and production needs are satisfied, among other things. The major issue that influences how productive a farm is handled is the farmer.

The accomplishment of soybean production levels is the consequence of farmer engagement in the integration process. In order to establish partnerships between the corporate sector and farmers in the future, it will be important to have a policy that allows each side to carry out its duties while receiving fair advantages and benefits.

Negara Asal	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Berat Bersih : 000 Kg										
Amerika Serikat	1 582 313,4	1 847 899,5	1 810 357,2	1 643 126,6	1 874 725,6	2 206 443,8	2 236 864,1	2 637 125,0	2 520 253,2	2 513 311,4	2 238 480,0
Kanada	8 477,9	4 764,4	7 632,5	3 834,6	22 003,4	26 117,2	7 404,9	12 104,0	54 531,3	128 911,8	229 644,1
Malaysia	60 009,2	120 073,8	56 037,6	19 195,1	13 573,2	13 079,3	5 647,3	9 505,5	10 413,1	8 683,5	6 363,1
Argentina	78 233,5	73 037,2	2 551,5	90 687,7	23 087,5	1 000,3	7 498,3	5 000,0			
Uruguay	1 495,7	16 825,3	7 616,3	6 131,7	22 450,1	4 787,1	2 727,5	2 568,2			
Ethiopia	0,0	583,6	240,0	5 920,5	4 525,4	2 180,0					
Tiongkok [1]	193,7	1 620,2	596,9	240,0	620,0	2 225,4	1 520,4	0,0	11,8		
Brazil						1 002,6	0,0	500,9	0,0	18 900,0	0,0
Myanmar						96,0	0,0	0,0	0,0	46,0	0,0
Singapura								303,4	1,9	1,7	0,7
Prancis									126,8	231,0	120,7
Lainnya	9 781,3	23 811,5	36 174,5	16 248,3	4 826,0	0,0	140,8	4 807,1	471,0	1,0	678,1
Jumlah	**1 740 504,7**	**2 088 615,5**	**1 921 206,5**	**1 785 384,5**	**1 965 811,2**	**2 256 931,7**	**2 261 803,3**	**2 671 914,1**	**2 585 809,1**	**2 670 086,4**	**2 475 286,7**

Can be seen from the table, countries that import soybeans to Indonesia including the United States, Canada, Argentina Malaysia and other countries, almost 90% of the most suppliers from the United States Indonesia still need soybean imports, where the average soybean needs in Indonesia as much as 2-2.8 million tons per year. However, local soybean production currently only ranges from 800,000 tons per year. The demand for soybeans in Indonesia is still a lot because soybean production in Indonesia is still very little.

Indonesia's dependence on soybean imports, which increases both volume and value, is very dangerous for food security The existence of soybean imports that can actually be produced by farmers in the country, making farmers enthusiasm to increase production. From data from the ministry of agriculture said about 86.4% of domestic soybean needs came from imports. This year soybean imports reached 2.6 million tons. Increasing domestic soybean production is essential to strengthen food security. It is necessary to expand the area which is accompanied by increased productivity. and streamline extension work related to research and engage the private sector to build partnerships with farmers.

REFERENCES

Alimoeso, S. 2008. Produksi Kedelai Belum Akan Menolong. Kompas, 26 Januari 2008.

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Digital Cooperation in The Agricultural Corporatization Business Model

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The agricultural sector, which is very important for Indonesia, even continues to grow during the pandemic, is inversely proportional to the welfare of farmers. In an era where face-to-face markets are turning to digital markets, it is difficult for farmers to survive. There needs to be a creative model that can teach digitalization to farmers to improve farmer welfare, future farmer resilience, and sustainable food security.

The Importance of Agri-food for Indonesia

The agriculture-based food sector (agri-food) is the main pillar of the national economy in Indonesia. Third of Indonesia's total GDP in 2019 came from agri-food. The Economic Impact of Agri-Food Sector in Southeast Asia revealed in its report on the challenges and economic impacts of the agri-food sector in 2020, which was inaugurated by Food Industry Asia (FIA), the agri-food sector has a very important role in promoting economic recovery in Indonesia, create jobs, and ensure food is available at stable prices. In the report, the agri-food sector in Indonesia contributes to GDP of US$ 374 billion. Agri-food also plays a role in absorbing the total number of workers with a total of 63.4 million jobs, thus becoming the most important job generator in the country's economy. This sector also generated a total tax revenue of US$ 42.7 billion.

Agrifood Sector and Agri-food Farmers State During the Pandemic

During the COVID-19 pandemic, the agri-food sector actually showed an increase and became one of the sectors that supported the country's economy. The report notes that the agri-food sector has continued to grow during the COVID-19 pandemic, with 2% growth in 2020, or an increase in GDP contribution of US$ 8.2 billion. This sector is the only sector that grew positively during the Covid-19 pandemic.

NTUP or the value that shows the terms of trade of agricultural products with production costs in December 2020 recorded an increase of 0.70%. However, for the food crops subsector, the NTUP fell 0.19% which indicates the growth is inversely proportional to the condition of the farmers. In the era of the COVID-19 pandemic, where basic needs such as food are crucial, the selling price of food commodities has actually decreased. The decline in the prices of a number of food commodities in several regions in Indonesia was confirmed by member of DPR-RI Golkar Commission IV, Panggah Susanto, who allegedly correlated with the declining purchasing power of the public. The decline in people's purchasing power was exacerbated by the closure of a number of traditional markets. This is reinforced with data released by IKAPPI, there were 153 new cases in 28 markets. Unfortunately, apart from traditional markets and collectors, most farmers have no other market to sell their crops more properly.

Digitalization is key of market change patterns during the pandemic

The closure of some traditional markets shift face to face marketing to digital marketing. In addition, several agri-food technology (agritech) companies in Indonesia have shown significant developments, such as Sayurbox or TaniHub. Even the Minister of Cooperatives and SMEs Teten

Masduki encouraged cooperatives in the production sector to partner and collaborate with the TaniHub Group. So, there is still a big opportunity for farmers throughout Indonesia to join as partners of agritech companies. Unfortunately, the main challenge to carry out digital transformation in the agri-food sector is the ability of the farmers themself, which results in low control of operational activities and technology development. Around 13.9 million farmers only graduated from elementary school and even 8.2 million did not finish elementary school. So, the first step that agricultural stakeholders need to pay attention to if they are going to increase agricultural productivity through digital transformation is to increase the capacity of human resources.

Innovation Model of Digital Cooperation in the Agri-food Corporation Business Model Through Undergraduate Student Mentoring Programs for Farmers

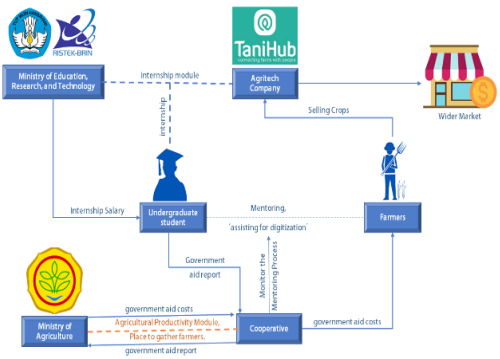

Figure 1. Innovation Model

Stakeholders involved and their roles:

1. **The Ministry of Education** plays a role in making internship modules with agritech companies to recruit undergraduate students as well as providing internship salary.

2. **The Ministry of Agriculture** has a role in making agricultural productivity modules with cooperatives and providing government aid costs to farmers through farmer cooperatives.
3. **The Agritech company acts** as a digital platform provider so that farmers have the opportunity to have a wider market.
4. **Cooperatives,** whose role is to gather farmers who are willing to join the program, distribute government aid costs, check financial reports, and monitor the program.
5. **Undergraduate students** act as mentors for farmers according to the internship module from the ministry of education and the ministry of agriculture.
6. **Farmers** as the main subject are entitled to get things according to the internship modules and productivity modules.

Every stakeholder plays an important role in this program. To achieve this common goal, the cooperation of all parties is required. With this program, it is hoped that farmers will be more resilient and ready to face various uncertainties that may occur in the future and improve national food security. This program is also expected to be implemented not only in Indonesia but also in other countries that face the same agri-food sector problem.

REFERENCES

Agustini N. 2020. Sumber daya Manusia: Tantangan Transformasi Digital Pertanian. Retrieved from http://forbil.id/kebijakan/sumber-daya-manusia-tantangan-transformasi-digital-pertanian/nitia_ayu/.

[FIA] Food Industry Asia. 2021. THE ECONOMIC IMPACT OF THE AGRI-FOOD SECTOR IN SOUTHEAST ASIA. Oxford, UK. Retrieved from https://foodindustry.asia/hubfs/Resources/Trade%20and%20Harmonisation/The%20Economic%20Impact%20of%20the%20Agri-food%20Sector%20in%20Southeast%20Asia%20-%20Executive%20Summary.pdf?hsLang=enSetnas ASEAN. 2021. Sektor Agri-food Indonesia Hadapi Risiko Pemulihan Terbesar di Kawasan Asia Tenggara. Retrieved from http://setnas-asean.id/news/read/sektor-agri-food-indonesia-hadapi-risiko-pemulihan-terbesar-di-kawasan-asia-tenggara.

[Kemenkop Ukm] Kementerian Koperasi dan UKM. 2020. Menkop Ukm Gandeng TaniHub dalam Menyerap Hasil Pertanian. Jakarta: Kementerian Koperasi dan UKM. Retrieved from https://kemenkopukm.go.id/read/menkopukm-gandeng-tanihub-dalam-menyerap-hasil-pertanian.

Widi H. 2021. Pasar Tradisional, Setahun Lebih Mengarungi Pandemi. Retrieved from https://www.kompas.id/baca/ekonomi/2021/07/01/pasar-tradisional-setahun-lebih-mengarungi-pandemi/.

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Changes to Production Systems and Product Substitutions as The Cause from The Covid-19 Outbreak

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In case of a pandemic, individuals' and assembling organizations' social supportability would take on new measurements. Most assembling and store network organizations are presently endeavoring to predict COVID-19's negative ramifications. Most of worldwide business sectors are contracting, along these lines modern chiefs are searching for new materials and cycles to make all the difference for creation. Outstandingly, the COVID-19 episode incredibly increments hierarchical natural manageability, yet to the detriment of a contracting shopper market and new issues for mechanical work the executives.

On a greater scale, the current COVID-19 flare-up affects worldwide and public creation frameworks and exchange. Numerous essential things, like food, food, and drugs, are hard to find, bringing about a monstrous inventory request jumble.

The spread of COVID-19 altogether affects the overall assembling and inventory network organization. Assembling plants have been closed down or are working at diminished limit. Besides, exchange and transportation restrictions have influenced the production network of both crude and completed merchandise. Most of COVID-19 is dedicated to clinical science, with no notice of creation and tasks the board. To address the previously mentioned issues and to propose a methodology for overseeing store network creation and tasks.

The significant objective of this assessment paper is to distinguish the issues that assembling and administration organizations stand up to, just as potential quest boundaries for managing post-pandemic circumstances.

The essential goal of this work is to give the executives scientists a weighty methodology for managing a pandemic circumstance in the current professional workplace, just as an alternate course of action to control and upgrade in such future emergencies.

Pandemic control and production system

A great many people have been beset by the Covid flare-up, which is a worldwide compassionate emergency. The pandemic's financial effect can be noticed all through enterprises, despite the fact that it very well might be generally clear in the shopper items industry. The post-COVID period presents an open door for a drawn out corporate change, just as the need to fortify stockpile and creation frameworks. The COVID-19 situation gives a chance to foster an adaptable and strong assembling framework to guarantee the creation interaction's monetary and social practicality.

The Indian government is proposing different monetary motivations for reinforcing MSMEs in the post-COVID age, demonstrating that most worldwide assembling pioneers are by and large tough enough to change their creation methodology to pandemic-based necessities. Coronavirus disease can be diminished by setting up and upholding social partition at work places, keeping up with cleanliness, and holding conferences on advanced stages. **(Dublin, 2020)**

The following significant issue confronting nations is the booking of prepared clinical experts, task assignment, and vehicle planning for clinical faculty and contaminated people. Delivering the important products preceding a pandemic episode is very troublesome in the genuine world.

In view of COVID-19, generally worldwide and neighborhood fabricating enterprises (autos, transportation, drugs, food, etc) must restore their creation limit and source crude materials. The business' renewal will likewise require further support from public and provincial governments.

A Rise in Product Switching

Organizations, governments, and societies all over the world are dealing with unprecedented challenges as a result of the COVID-19 epidemic. Organizations are responding in a variety of ways to ensure organizational consistency, sustain inventory network robustness, and diversify revenue streams.

Almost half of these customer transfers are due to a lack of availability of the preferred item, with the remaining 19% opting for more economical alternatives. Following the pandemic, 12% of customers who switched brands intend to keep buying the new items. **(Camilo Becdach, 2020)**

Straightforward cleanliness and assurance things can habitually be delivered rapidly, with organizations adjusting gear, directing essential examination and plan, and afterward making face covers or hand sanitizer in merely days. **(Miller, 2020)**

Given these outcomes, this present time is the best opportunity for makers to embrace and use industry 4.0 and advanced advances. The utilization of robots in the clinical framework can assist with limiting the spread of COVID-19 and guarantee better tolerant checking. Purchasers' mentalities toward web-based business and computerized arrangements have moved because of the pandemic. The pandemic has cleared out positions and placed huge number of individuals' lives in risk. Many women and men's food security and sustenance are jeopardized as providers lose jobs, go ill, or die, with those in low-pay countries, notably the most marginalized populations, such as limited scope ranchers and indigenous people groups, taking the brunt of the blow.

During the COVID-19 emergency, food security, general well-being, and business and work issues converge, particularly specialist well-being and security. The human aspect of the problem will necessitate adherence to workplace safety and well-being standards, as well as the admission of fair employment and the protection of workers' rights in all businesses.

The COVID-19 issue has compelled manufacturing organizations to postpone their creation frameworks for a longer period of time as they look for long-term solutions to ensure constant stockpiling and activities from the perspectives of both organizations and customers. To deal with the current crisis and prepare for future pandemics, creation and administration organizations must be scalable and adaptable.

To bring down the quantity of laborers and, subsequently, the danger of a pandemic, modern firms should move their assembling abilities to computerized producing. Likewise, The pandemic condition diminishes worldwide fossil fuel byproducts and guarantees natural maintainability; yet, organizations and individuals from one side of the planet to the other are wrestling with employment misfortunes, laborer security and emotional well-being troubles, and monetary weights because of creation misfortunes and site terminations.

Right now is an ideal opportunity for worldwide fortitude and help, especially for the most weak individuals from our social orders, particularly in rising and agricultural nations. Simply by cooperating would we be able to conquer the pandemic's connected wellbeing, social, and monetary impacts and keep it from growing into a drawn out helpful and food security debacle, possibly clearing out currently made advancement gains.

REFERENCES

Camilo Becdach, B. B. (2020, April 21). *Rapidly forecasting demand and adapting commercial plans in a pandemic*. Retrieved august 18, 2021, from mckinsey and company: https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/rapidly-forecasting-demand-and-adapting-commercial-plans-in-a-pandemic?cid=other-eml-alt-mip-mck\046hlkid=c93338622c1d49f6ac15c68e0d8fefba\046hctky=11555736\046hdpid=8cdeaa7b-203f-4a.

Dublin. (2020, april 16). *Impact of COVID-19 on the Global Manufacturing Industry, 2020*. Retrieved agustus 18, 2021, from PRNewswire: read://https_www.prnewswire.com/?url=https%3A%2F%2Fwww.prnewswire.com%2Fnews-releases%2Fimpact-of-covid-19-on-the-global-manufacturing-industry-2020-301042150.html.

Miller, N. (2020, april 13). *How factories change production to quickly fight coronavirus*. Retrieved august 18, 2021, from BBC: https://www.bbc.com/worklife/article/20200413-how-factories-change-production-to-quickly-fight-coronavirus.

Halal Management System

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Sustainable Agriculture Transformation: Change Management and Innovation in The Agri-Food Sector Through MSME Halal Certification Efforts

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The COVID-19 pandemic has affected the global rural economy by disrupting the means and ways of agricultural production. The restrictions on mobility alone greatly impacted the process of harvesting crops, and border limitations have made it difficult for countries to import and export staple food such as rice. Not only did COVID-19 expose the gaps in our public healthcare systems, but it also exacerbated the challenges in our agricultural food sector that governments have yet to address.

This paper explores the current context of agriculture in Southeast Asian economies while identifying possible innovations such as MSME Halal Certification Efforts as a means for sustainable agri-food development. This study argues the importance of local change management in transforming agricultural food systems. Contextualized solutions must be applied for practical innovations to happen. All stakeholders who benefit from agricultural food production must be involved.

Agricultural Food Sector in Southeast Asia

The rise of the Southeast Asian population is directly related to the region's economic development. Free trade, direct foreign investments, and regional integration account for the productivity growth of member states (Asian Development Bank, 2000). Naturally, as demographic rates rise, so does the demand for food staples.

The Association of Southeast Asian Nations (ASEAN) comprises six agri-food industries in the food value chain: agriculture, fishing, food and beverage, wholesale trade, retail trade, and hotels and restaurants (ERIA, 2019). According to Oxford Economics, the agri-food sector contributed more than USD 700 billion to four Southeast Asian economies pre-pandemic (2021). Countries like Indonesia, the Philippines, Thailand, and Vietnam garnered high economic revenue from the agri-food sector alone. In addition, the industry has provided income and employment in the region, sustaining at least 127 million jobs in 2019 (Oxford Economics, 2021).

COVID-19 Impact on Southeast Asian Agri-Food Sector

However, the COVID-19 pandemic introduced high levels of poverty in vulnerable segments of the population. A policy briefing in 2020 by the United Nations revealed that due to policy lockdowns and quarantine measures, Southeast Asian countries dependent on trade and merchandise would suffer economic losses. The rise of unemployment also means the decline of labor productivity, affecting how we consume and produce food.

There is also a disrupted chain of supply and social protection, leading to drastic production changes that cause uneven food price effects. These factors contribute to the increased vulnerability of food insecurity in Southeast Asia (High-Level Panel of Experts on Food Security

and Nutrition, 2020). Before the pandemic, the region was already suffering from threatened food security and nutrition. According to the International Food Policy Research Institute (IFPRI), factors such as the degradation of natural resources, urbanization, and climate change have contributed to the region's vulnerability to food scarcity (2019).

With almost 700 million people hungry, 750 million people suffering from food insecurity, and nearly 2 billion people without access to safe and nutritious food, the world is far from achieving its Zero Hunger target by 2030 (FAO, 2019). Thus, it is pertinent that regional governments implement change management and innovation to the food value chain. The agri-food industry, although volatile during the pandemic, can still shift to a sustainable, thriving sector post-COVID-19 through a strategic collaboration of all stakeholders involved. Global, national, and household strategies must be applied at different levels. To achieve food security, contextualized reforms and policies must be strictly implemented.

MSME Halal Certification Efforts

The halal industry gained traction in the past two decades following the growth of the global Muslim population. Halal, which is Arabic for permissible or lawful, refers to food and beverages consumable to Muslims. According to Intracen in 2015, it is expected that the Muslim population will reach 2.2 billion by 2030, thus the demand for halal products and services.

Since the halal industry is not limited to just food but also includes compliance with the supply chain, halal certification for food and services paved the development of halal standards. In Southeast Asia, the multicultural population of the region pushed non-Muslim countries like Thailand to invest in halal products (Kompas, 2017). Indonesia, the largest Islamic country in the world, is home to more than 267 million Muslims or a total of 87% of the population. It is no surprise that the country has asserted itself as a strong competitor in the halal market.

The same also goes for Southeast Asian countries Singapore and Brunei where a wide array of products and services with halal logos. Based on the Global Economic Report (GER) in 2019, significant spending by Muslim consumers around the world on halal food, tourism, pharmaceuticals, and lifestyle in recent years is expected to reach 3.2 trillion US dollars in 2024. Wahid (2012) sees that the obstacles to implementing halal certification in Indonesia are mostly caused by the lack of government role. Regulations as a legal umbrella are not integrated and run without control, weak supervision, and low law enforcement. Saifullah (2008) even concluded that although government policies related to halal issues already exist, the effectiveness of implementing these policies is still relatively low. Per the HAS 23000 halal assurance system, efforts are needed that are directed, controlled, and in accordance with applicable SOPs to realize a halal certificate in the company's functionality which includes the company's halal policy management, halal management team, training, and education section, production and facilities production, parts of raw materials, internal audit, as well as efforts to make written procedures for critical activities.

Certification is needed to make Indonesian halal products globally competitive, and it can also open more comprehensive market access and attract demand from export destination countries. Exporters should consider this certification to enhance the added value of their products, which will also increase the competitiveness and export value of halal products and ultimately positively contribute to Indonesia's trade balance.

Key Stakeholders Involved

The agricultural supply chain involves both internal and external stakeholders. In the context of the farm food sector, five influential stakeholders are included.

Farmers - If agriculture had a body, farmers would comprise 90% of it. Without farmers, agricultural food systems would suffer. Although technological advancements have introduced machinery that makes plowing and harvesting more efficient, farmers bridge the gap from producer to consumer.

Agricultural service providers - Without institutions that support agricultural services, farmers struggle to bring their harvest to more tables. Second and third-party providers make agricultural food products accessible and scalable to consumers.

Consumer packaged goods companies - Packaged goods companies make food more practical to consumers. By packaging goods in different quantities, agricultural produce is now more consumer-friendly.

Distributors and retailers - Distributors and retailers promote food accessibility. Sustainable development must also recognize the realities that commercialized agricultural products are not readily available in rural areas. This is where the role of distributors and retailers comes in.

Consumers - Consumers dictate market trends and demands. During the pandemic, economic rates fluctuated depending on the restrictions on mobility and employment. The more purchasing power the workforce has, the higher chance of agricultural sectors to thrive.

Consumer Role in Sustainable Agri-Food Transformation

The role of consumers is pivotal in the sustainable development of agricultural economies. In Southeast Asia, the demand for food security is high following the rise in COVID-19 cases. Organic agrarian food production is needed to supply the natural food products that help strengthen one's immune system. Consumers have the agency to transform agri-food processes by demanding local governments to impose flexible policies on labor and mobility service providers.

Farmers fall under this category and thus allows them to produce crops for import and export. Moreover, consumers should also be critical of how agri-food is packaged. Sustainable agricultural development not only involves the way agriculture is sourced but also how it is presented. The consequences of climate change directly affect agricultural systems, so distributors and companies should ethically package agricultural products. With consumerism dominating market trends, boycotting excessive plastic packaging in retail outlets is enough to push corporations to produce ethically-packaged agri-food products.

Importance of Halal in Sustainable Agri-food Transformation

Halal certification positively influences goods and services. Aside from catering to the growing Muslim population, halal certification guarantees the safety of the product consumed, animal welfare, comparative advantages from commercial goods.

Halal certificates have a positive influence on a product or business entity; at least halal certificates can guarantee the safety of products consumed, animal welfare, and improve company documentation and administration (Prabowo and Rahman 2016). In addition to providing security, safety, comfort, and certainty of the availability of halal products for the public in using and consuming them, halal products have been proven to increase added value and competitiveness for business actors (Wahid 2012).

In conclusion, sustainable agriculture transformation requires a multidisciplinary approach from all stakeholders involved. In the post-COVID-19 era, Southeast Asian economies must pivot to a sustainable way of ethically producing and packaging agricultural products. Farmers should also be the primary beneficiary of local government policies in favor of agricultural production. Lastly, contextual agrarian reforms must be made to address the varied challenges of Southeast Asia in response to the implications of the COVID-19 pandemic.

The increasing demand for quality and food safety guarantees requires business actors to adapt to meet consumer desires. Halal certification is indirectly a guarantor of the quality of a product. While achieving global food security is a difficult feat, Southeast Asia is a regional agri-food economy. The different aspects of the food value chain are deeply embedded in our way of life, and agriculture sustains people's livelihoods. Through resilient food systems, sustainable agri-food transformation, and consumer education, Southeast Asia can pivot to a futureproof agri-food economy in the near post-COVID-19 era.

REFERENCES

Hossain, S. T. (2020). Impacts of COVID-19 on the Agri-food Sector: Food Security Policies of Asian Productivity Organization Members. *Journal of Agricultural Sciences – Sri Lanka*, *15*(2), 116. https://doi.org/10.4038/jas.v15i2.8794.

https://ekon.go.id/publikasi/detail/597/komitmen-pemerintah-wujudkan-indonesia-jadi-pusat-produsen-halal-dunia.

Kusano, E. (2019, September 23). *Overview of Agri-food industries in asean: Basic information on the food value chain.* ERIA. Retrieved September 20, 2021, from https://www.eria.org/publications/overview-of-agri-food-industries-in-asean-basic-information-on-the-food-value-chain/.

Kompas. 2017. Wich country dominates the world is halal industry. https://ekonomi.kompas.com/read/2017/11/08/205641726/negara-mana-yang-rajai-industri-halal-dunia. Accesed on 12 August 2021.

Oxford Economics Ltd . (2021). T*he economic impact of the agri-food sector in Southeast Asia.*

Prabowo and Rahman. 2016. Halal certification in the agricultural product processing industry sector. Research forum agro economic. Vol. 34 No. 1, Juli 2016: 57-70.

Schleicher, A. (2020, July 14). *COVID-19 pushes world "OFF track" to achieve ZERO hunger goal by 2030.* nutritioninsight.com/. Retrieved September 20, 2021, from https://www.nutritioninsight.com/news/covid-19-pushes-world-off-track-to-achieve-zero-hunger-goal-by-2030.html.

Takeshima, H., & Joshi, P. (2019). Overview of the agricultural modernization in Southeast Asia. *International Food Policy Research Institute*. Published.

The world is off-track to meet most food and agriculture-related sustainable development goals. FAO. (n.d.). Retrieved September 20, 2021, from http://www.fao.org/news/story/en/item/1202226/icode/.

The Impact of COVID-19 on South-East Asia.https://www.unescap.org/sites/default/d8files/2020-07/SG-Policy-brief-COVID-19-and-South-East-Asia-30-July-2020.

The Government's Commitment to Make Indonesia a World Center for Halal Producers from

United Nations. (2020). *Policy Brief:*

Wahid N. 2012. See halal products from the comparative perspective advantage. Journal of Halal. 98:30-31.

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Strategy For Sustainable Agricultural Industry Development Through MSME Halal Certification Efforts

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United Nation, released information on the increase in the world's population. In 2011, the world's population reached 7 billion people. It rose to 7.4 billion people in 2016, then rose to 7.7 billion people in 2020. It is estimated that in 2030 it will grow to 8.5 billion people and reach its highest point in 2050 of 9.7 billion people (Kompas 2020). This requires the need for sufficient food through efforts to provide a sustainable agricultural sector in order to ensure the survival of the world community. Indonesia occupies the position as the largest Muslim country in the world with 87.2% of adherents of the Islamic religion or equivalent to 209.12 million of the total population (Global Religious Future Project, 2020). Furthermore, the number of Muslim population in the world has reached around 1.7 billion people, so halal products have enormous potential.

However, less than 10% of MSMEs have halal certificates, far from large industries which are more than 60% (Pujiyono et al 2018). The development of halal MSMEs so far is still experiencing difficulties stemming from several aspects, namely, halal certification, capital, partnerships, low quality of human resources, limited use of technology, marketing, and the lack of education and literacy on halal MSME products (Surani et al 2020). In addition, the majority of MSMEs have not taken full advantage of the development of information technology. Evidently, only

8 million or around 13% of MSMEs in Indonesia have taken advantage of technological opportunities in the form of digitalization (Kominfo 2020).

This paper aims to provide an overview of the importance of optimizing the agricultural industry sector through MSME halal certification efforts. For this purpose, it is also conveyed about the potential of the world halal market and the development of the halal industry in Indonesia. This paper was written and formulated using the literature study method. The types of literature used are journals, books, newspapers, electronic media, and credible articles.

MSMEs

Reporting from BPS, as many as 26 million MSMEs in Indonesia are engaged in the agricultural sector. MSMEs contributed to GDP 57.8%, employment 97.2%, and total exports 15.8% (Slamet et al. 2016). thus making Indonesia the country that has the most MSME contributions in Asia. According to Law no. 20 of 2008 concerning Micro, Small and Medium Enterprises Chapter 1 Article 1, Medium enterprises are productive economic enterprises that stand alone, which are carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become part of either directly or indirectly. or indirectly with a small business or a large business with a total net worth or annual sales. A business unit can be said to be a Medium Enterprise if it has assets of more than 500 million – 10 billion rupiah and a turnover of more than 2.5 billion – 50 billion rupiah.

Halal Industrion

The halal industry has become a focus for countries in the world. In fact, Thailand has established itself as a major player in halal products and has established Indonesia as their main target for the halal market (Kompas 2017). In fact, Indonesia is only able to supply 19% of halal

products to the Asian market, of which Asia itself is the largest market for halal products in the world, which reaches 63%. Indonesia seeks to anticipate the development of this halal issue with the ratification of Law no. 33 of 2014 (Law No. 33/2014) concerning Halal Product Guarantee. In addition to aiming to provide security, safety, comfort, and certainty of the availability of halal products for the public in using and consuming them, halal products have been proven to increase added value and competitiveness for business actors in doing business (Wahid 2012).

In Indonesia, the halal certification effort has reached 25 years. However, in a fairly long period of time, significant progress has not been felt, even if it is still less intense compared to Malaysia and Thailand. According to Purnomo (2011), Indonesia's competitive position in the development of the ASEAN halal agro-industry occupies the fifth position. In institutional factors, Indonesia or extrinsic, only excels in factors of halal certification, market potential, availability of raw materials, and certification bodies, while commitments and government policies, infrastructure, and international and domestic advocacy capabilities, Indonesia is below other countries (Prabowo and Rahman 2016). Wahid (2012) sees that the obstacles to implementing halal certification in Indonesia are mostly caused by the lack of government role. Regulations as a legal umbrella are not integrated and run without control, weak supervision, and low law enforcement. Saifullah (2008) even concluded that although government policies related to halal issues already exist, the effectiveness of implementing these policies is still relatively low. The implementation of policies for handling halal food has not been well socialized to the public, especially to the food industry as the main actor. So what steps need to be taken by Indonesia in order to create a global-based product halal system based on digitalization efforts?

In accordance with the HAS 23000 halal assurance system, efforts are needed that are directed, controlled, and in accordance with applicable SOPs in an effort to realize a halal certificate in the company's functionality which includes the company's halal policy management, halal management team, training and education section, production and facilities production, parts of raw materials, internal audit, as well as efforts to make written procedures for critical activities. This is an initial requirement that business actors must fulfill so that later in the management and implementation of halal certification, it can run smoothly. Furthermore, government involvement in efforts to fulfill halal certification for business actors is the main key, it needs support and encouragement from the government to oblige the industry to carry out halal certification, because so far the government has only made an appeal, not mandatory (Hasan 2014). This is considered to be one of the causes of the long process of national halal certification.

In order for business actors to obtain permits for the halal certification, strict supervision is needed, controlled internal controls, and non-overlapping and complicated rules are considered to be the key in the national halal certification effort, especially agricultural products which are primary ingredients to be processed into food products. other. In fact, halal certificates have a positive influence on a product or business entity, at least halal certificates are able to guarantee the safety of products consumed, animal welfare, pacify the public from sensitive issues, provide comparative advantages, protect domestic products, and improve company documentation and administration (Prabowo and Rahman 2016).

The increasing demand for quality and food safety guarantees requires business actors to continue to adapt to meet consumer desires. Halal certification is indirectly a guarantor of the quality of a product. The low supply of agricultural products that are guaranteed to be halal is felt to be a separate opportunity for industries with halal certification to become major players in the international market.

REFERENCES

Government of Indonesia. Constitution Number. 20 Years 2008 About Micro small and medium enterprise.

Katadata. 2020. Indonesia is the biggest moslem people in the Wolrd. https://databoks.katadata.co.id/datapublish/2019/09/25/indonesia-negara-dengan-penduduk-muslim-terbesar-dunia. Accesed on 12 August 2021.

Kominfo. 2020. Increase Productivity and added value of MSMEs trough digital technology. https://www.kominfo.go.id/content/detail/30276/tingkatkan-produktivitas- dan-nilai-tambah-umkm-melalui-tekonologi-digital/0/berita. Accesed on 12 August 2021.

Kompas. 2020. Amount off people in the World 2020. https://www.kompas.com/skola/read/2020/07/11/140300869/jumlah-penduduk-dunia-2020. Accesed on 12 August 2021.

Kompas. 2017. Wich country dominates the world is halal industry. https://ekonomi.kompas.com/read/2017/11/08/205641726/negara-mana-yang-rajai-industri-halal-dunia. Accesed on 12 August 2021.

Prabowo and Rahman. 2016. Halal certification in the agricultural product processing industry sector. Research forum agro economic. Vol. 34 No. 1, Juli 2016: 57-70.

Pujiyono et al. 2018. Halal msme development strategy in java central in facing global competition. Indonesian Journal of Halal. Vol 1 (1): 1-8.

Purnomo D. 2011. Halal agro-industry development strategy in anticipating the global halal business [Dissertation]. [Bogor (ID)]: Bogor Agricultural University.

Saifullah R. 2008. Study of halal food policy in Indonesia [Thesis]. [Bogor (ID)]: Bogor Agricultural University, Faculty of Agricultural Technology, Department of Food Science and Technology.

Slamet R, Nainggolan B, Roessobiyatno R, Ramdani H, Hendriyanto A, Ilma L. 2016. Developmnet Strategy Digital MSMEs in face of market free era. Journal of Indonesia Mangement. 16(2) :136-147.

Surani D, Kusuma AC. 2020. English language training for MSMEs on English transactions and promotions at the BUMN Creative House (RKB)– Cilegon. Journal of IKRAITH-ABDIMAS. 3(2): 55-60.

UKM Indonesia. 2018. Picture of Indonesia MSMEs: Poppet that have big impact. https://www.ukmindonesia.id/baca-artikel/62. Accesed on 12 August 2021.

Wahid N. 2012. See halal products from the comparative perspective advantage. Journal of Halal. 98:30-31.

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Muslim Vaccine Hesitancy in The Philippines: Are COVID-19 Vaccines Halal Certified?

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Knowledge of Halal dietary laws is crucial for Muslim communities who strictly follow them as well as to curious consumers who are not Muslim but consume Halal (Regenstein et al. 2003). The interdependence of their bodily and spiritual well-being is symbolized by what Muslims consume. Halal practices are in conformity with the Quran, the Muslim sacred literature. The holy book explains that Halal is that considered permissible, approved, and accepted for Muslim consumption. Muslims should only consume pure, healthful, and legal consumables or Halal, since this will become a part of their physical, mental, and spiritual well-being (Liba, 2015).

Several countries in Southeast Asia have predominantly Muslim populations, Although the Muslims in the Philippines constitute only 6.01% of its population, Proper knowledge of Halal is especially important to countries such as the Philippines that have Islam as the second-largest religion in the country. The Halal certification in the Philippines has been a necessary tool in helping the Muslim population in the Philippines to make informed choices in identifying the products that are approved and accepted for Muslim consumption (Liba, 2015). Given that the Islamic religion lays a significant focus on cleanliness in all aspects of life, problems arose when the novel Coronavirus (COVID-19), had reached the Philippines.

Towards the end of 2019, the world was met with a crisis when COVID-19 spread throughout numerous countries, including the Philippines. The virus had spread rapidly affecting millions of Filipinos. According to the World Health Organization, from January 2020 to September 2021, the Philippines had accumulated almost 2,121,308 confirmed cases of COVID-19. The Philippines responded with strict and long lockdowns which prohibited businesses from operating, creating a pandemic-induced recession, leaving millions of Filipinos unemployed for months on end (Rivas, 2021). The best hope for the Philippines was the arrival of the Vaccines and achieving herd immunity. However, misconceptions and misleading information on the Vaccine had spread faster than the virus itself. even when vaccination plans were being rolled out in the Philippines, many of the Muslim population showed hesitancy in receiving the Vaccine. Due to widespread disinformation online, there were several concerns surrounding the COVID-19 vaccines. Muslims feared that pork gelatin is present in the vaccine which is prohibited to them because it is not deemed Halal (Times Now Bureau, 2020). This was a pressing situation for Muslims, for getting vaccinated meant that they were preventing the spread of COVID-19, However, it also meant that they would face punishment if in the case that COVID-19 vaccines did contain pork traces. This posed harm and threat to Muslim Filipinos, especially for religiously committed Muslims, as the consumption of forbidden and prohibited food/material could put them in danger (Ghaly, 2021). Filipino Muslims then waited for Filipino Muslim leaders to decide whether or not the COVID-19 vaccines were safe and Halal for Muslims to use. In February 2021, secretary of the National Commission on Muslim Filipinos, Saidamen Pangarungan, urged Filipino Muslims that:

> *'Any substance that will effectively and safely protect people is considered halal, especially if it is the only viable option at present.'*

Moreover, in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) where the majority of Muslims in the Country reside, Health authorities claim that the COVID-19 vaccines specifically the SINOVAC, is considered Halal by the Indonesian halal certification body which makes them safe for Muslims to use. However, it is important to note that these COVID-19 vaccines are yet to be examined and approved by Philippine Halal certifying bodies or HCBS (Esmaquel II, 2021).

The problem becomes even more complex because the AstraZeneca vaccine is confirmed using trypsin derived from the pancreas of pigs in Indonesia (MUI Salam Team,2020). However, a spokesperson from AstraZeneca denies this claim and states that the AstraZeneca vaccine does not contain pork. As a result of the inconsistencies, opinions are split into two. There are those who say that AstraZeneca is haram to use because it contains pork, on the other hand, there are also those who say that AstraZeneca is still halal due to 'emergency conditions' that allow Muslims to use them as well as health reasons. It is important to note that this issue depends on each individual Muslim. If Muslims have no other options other than AstraZeneca, then they may use it. However, if there are other options besides AstraZeneca, it is recommended to use another vaccine variant.

COVID-19 has posed a great challenge for Muslims, their leaders, and Halal certifying bodies. With the rising cases of COVID-19 in the Philippines, calls for mass vaccinations. However, COVID-19 was accompanied by an 'infodemic' which circulated misleading information on the disease as well as the Vaccine which only caused fear amongst the masses. Consequently, Muslims feared the vaccine contained pork traces which gave rise to vaccine hesitancy in the Muslim population. The important stakeholders in this situation are the Muslim leaders, Health authorities, Halal certifying bodies as well as vaccine manufacturers.

Given the dire state of the Philippines due to COVID-19, We personally understand the Health authorities rush and need to vaccinate the majority of the population as soon as they can. It is no doubt that it would prevent the spread of the virus which would lessen one of the many problems that the country is facing amid COVID-19. However, We do believe necessary steps should be taken, especially for Muslims in the Philippines. Although there is a need to vaccinate immediately if it would be at the cost of going against their religious practices as well as their own wellbeing and safety, it may not be worth it for them. We believe that there is another way to beat vaccine hesitancy among Muslims, which is to provide them with what they are asking for, a Halal certification. It will be beneficial to provide COVID-19 vaccines for the Halal certifying bodies to examine immediately and release a statement whether these are Halal or not. For this reason, empathy, understanding, and encouragement from the government are needed so that halal certification can be carried out as soon as possible. The sooner there is halal certification, the sooner Muslims will vaccinate without worry. In addition, with a large population vaccinating, this points that the third Sustainable Development Goals in the country's development can be implemented, namely good health and well-being. With this, Muslims will voluntarily get the vaccine with no fear that it is unacceptable by law and by religion. Additionally, individuals should be responsible enough to determine which information available online is 'true' and which is 'false'.

REFERENCES

Dandin. (2021). *Benarkah vaksin astrazeneca Mengandung UNSUR BABI?* Benarkah Vaksin AstraZeneca Mengandung Unsur Babi? Retrieved September 19, 2021, from https://mui.or.id/tanya-jawab-keislaman/31346/benarkah-vaksin-astrazeneca-mengandung-unsur-babi/.

Esmaquel II, P. (2021). *Filipino Muslim leaders ENDORSE COVID-19 vaccines, QUELL halal fears*. Filipino Muslim leaders endorse COVID-19 vaccines, quell halal fears. https://www.rappler.com/nation/filipino-muslim-leaders-endorse-covid-19-vaccines-quell-halal-fears.

Fernandez, E. (2021). *BARMM health exec says region assured Of 'halal' vaccines*. BARMM health exec says region assured of 'halal' vaccines. https://www.pna.gov.ph/articles/1132380.

Ghaly, M. (2021). Islamic ethics, COVID-19 vaccination, and the concept of harm. The Hastings Center. https://www.thehastingscenter.org/islamic-ethics-covid-19-vaccination-and-concepts-of-harm/.

Liba, R. T. (2015). *Issues, challenges and prospects of Halal restaurants in Metro Manila, Philippines*. International Conference for Tourism and Business. https://www.academia.edu/34550129/Issues_Challenges_and_Prospects_of_Halal_Restaurants_in_Metro_Manila_Philippines.

Regenstein, J., Chaudry, M. and Regenstein, C. (2003), The Kosher and Halal Food Laws. Comprehensive Reviews in Food Science and Food Safety, 2: 111-127. https://doi.org/10.1111/j.1541-4337.2003.tb00018.x

Rivas, R. (2021). *Unemployed Filipinos down TO 3.73 million in May 2021 AS lockdowns ease*. Rappler. https://www.rappler.com/business/unemployment-rate-philippines-may-2021.

Times Now Bureau. (2020). *Wait for 'FATWA' before getting COVID-19 VACCINE Shot, says DEOBAND cleric; BJP SLAMS 'halal' demand*. Latest News by Times now News. https://www.timesnownews.com/india/article/wait-for-fatwa-before-getting-covid-19-vaccine-shot-says-deoband-cleric-bjp-slams-halal-demand/698943.

World Health Organization. (2021.). *Philippines: Who Coronavirus Disease (COVID-19) dashboard with Vaccination Data*. World Health Organization. https://covid19.who.int/region/wpro/country/ph.

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Halal Management System in The Philippines

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As Islam is recognized by the Philippine Statistics Office (2017) as the second largest religious affiliation after the large percentage of Roman Catholics, 6% of the Philippine population who has sound grounding in the beliefs of Islam subscribe to the Islamic faith, or as it is often linked to in Arabic, *Halal.* The word can be loosely translated to *allowed* or *permissible* to the Islamic faith. However, Wilson & Liu (2010) emphasized that the general acceptance and belief of *what* is Halal is "central to every Muslim's belief" as such concepts is considered to be information that is known by one's own necessities. With this information, it is important to realize and acknowledge that there may be a variety of what is *truly* halal- an important discussion that must be highlighted to understand the differentiating contexts of Muslims all over the country, and even the globe. The role of the Islamic Shari'ah law must also underlined as it serves a

At first peruse of academic literature surrounding the theme of halal, it may be evident that, contrast to the mainstream beliefs, the concept of halal is not necessarily restricted to the discussions of what types of food Muslims can or can not eat; Halal encompasses the ethics, systems, and methodologies with various considerations. Notable is the emerging topic of halal tourism (see El-Gohary, 2016) in academia and other practitioners as well as the concept of halal employment and income, which considers the themes of earning and spending in the Islamic faith (Al-Qalam, 2017). Chief in the attributes of what can be considered by

Muslims to be halal to consume is the Halal certification and Halal quality labels that companies are obligated to adhere to. However Uwineza (2020) discusses that some companies only view Halal certifications as a sort of edge against other competitors- rather than seeing the significance of such certification, the status of being halal is used as a leverage to rivalry.

With this, it is essential to realize and understand the processes as well as importance of Halal systems in an overwhelmingly Catholic nation such as the Philippines. It is also important to acknowledge the different actions that the Philippine Government has taken to promote and actualize Halal processes in the country (Salindal, 2015); Take for example, the Philippine Department of Agriculture (DOA) launched the Halal Food Industry Development Program that aims to forward Halal Agricultural Production Program Initiatives (HAPPI) by forwarding Philippine National Standards for halal. The given standards were envisioned to provide standardized guidelines for the food industry on the preparation and handling halal food products and food trade in the Philippines. The Bureau of Agriculture and Fisheries Standards (BAFS) has also launched standardized guidelines for handling halal products in the country that includes (but is not limited to): 2016 Halal Agriculture and Fisheries Products, 2016 Halal Slaughtering Practice for Ruminants, 2016 Halal Slaughtering Practice for Poultry, and 2015 Philippine National Standard for Halal Feeds.

Additionally, the Philippines saw an opportunity to further promote its halal industry when it agreed to host the 2019 Southeast Asian Games as an alternate host country. In Southeast Asia an estimate of 260 million, or 40% of the population, are Muslims- which poses a new challenge for the halal industry in a widely Catholic nation. Other Islamic countries involved (such as Brunei, Indonesia, and Malaysia) in the sports events expressed their concerns regarding the provision of halal-friendly food; Which the Philippine Southeast Asian Games Organizing Committee

(PHISGOC) Food Catering Team promptly addressed by organizing teams from established and renowned experts in the halal food industry as well as showing further support to the Halal-Hazard Analysis Critical Control Point Food Safety System (HHACCP FSS) to build food handling competency of the personnel involved in the games (Azanza & Madriaga, 2020).

Arsad (2018) then posits the notion that the commercialhalal systems in the Philippines are yet to be considered as a fully-recognized concept. The expanding worldwide demand for halal food are slowly opening up opportunities for new players in the industry- yet it may be perceived that deeper knowledge and information about the halal concepts are still lacking for the benefit of both the consumers and manufacturers. Thus, the University of the Philippines undertook the responsibility of providing quality education regarding the topic by introducing Halal Lifestyles as part of their curriculums under the Social Science cluster.

REFERENCES

Arsad, N. A. R. (2018). Developing Knowledge Products to Strengthen Halal Infrastructure Systems in the Philippines. *JOURNAL OF HALAL INDUSTRY & SERVICES*, *1*(1).

Azanza, M. P. V., & Madriaga, H. P. (2021). Halal-HACCP Food Safety Competency Development for the 2019 SEA Games. *Philippine Journal of Science*, *150*(5), 1069-1080.

Department of Agriculture. *Republic Act No. 10817*. (2016). http://halal.da.gov.ph/legal-basis/republic-act-no-10817-2/.

El-Gohary, H. (2016). Halal tourism, is it really Halal?. *Tourism Management Perspectives*, *19*, 124-130.

Philippine Statistics Authority. (2017). Philippine Population Surpassed the 100 Million Mark (Results from the 2015 Census of Population).

Salindal, N. A. (2015). Halal certification and business performance of halal certified food companies in the Philippines.

Salvaña, F. R. P., Sepelagio, E. G., Sanchez, C. B., Besana, C. M., Kamamang, J. S., & Cardenas, L. B. (2019). Inventory and diversity of forages utilized by farmers raising goats in Halal way: The case of Region XII, Philippines. *Journal of Livestock Science*, *10*(2), 118-125.

Uwineza, C. L. (2020). Factors that influence the implementation of Halal certification by Dutch meat companies. [Unpublished Thesis Report]. Wageningen University.