

Sustainable agricultural policy strategy through increasing food crop productivity in Indonesia

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Abstract

Wanto, H. S. (2023). Sustainable agricultural policy strategy through increasing food crop productivity in Indonesia. *Bulg. J. Agric. Sci.*, 29 (2), 223–228

Sustainable food agriculture becomes a method that must be put in action. This effort is needed to realize food resilience domestically to boost food production surplus. This study aims to illustrate that sustainable food agriculture strategies have a major impact on the economy because of its food sources dependence on imported food that causes state income to decline. By knowing how essential sustainable agriculture is, particularly the current condition of agriculture, finding out the right strategy implemented in agriculture field becomes the main focus of discussion of this study. The methods employed in this study are reference study and analysis of macro data on Indonesian agriculture. The results of this study indicate that a sustainable agriculture strategy leads to sufficient food availability, leads to economic value of agricultural products and reduces production costs of the ongoing agricultural production process.

Keywords: Sustainable Agriculture, Food Resilience, Production Value

Introduction

Indonesia is an agricultural country and most of its citizens' occupations are related to agricultural sector. Agriculture is inseparable from land, which is a major factor in agricultural development. It does not only have economic value, but also social and religious value. In the sustainable agricultural development, in terms of agricultural business, land is a primary resource, especially for the conditions where most of the businesses still rely on land-based agriculture. Land is a natural resource, which is scarce because their numbers do not increase, but the demand for land always increases (Radianto, 2020). Mariyono et al. (2020) mentions that educational institutions are able to significantly encourage farmers to have sustainable agricultural capabilities (Mariyono et al., 2020). Food estate requires problem solving and management of disaster prevention due to climate change and sustainable agriculture (Bayu, 2020).

To improve food estate in Indonesia, sustainable development activities should be carried out. With a sustainable development system in agriculture, the Indonesian nation will one day be able to be independent in fulfilling the needs of food (Nugroho and Siswati, 2015). The policy for the protection of sustainable food agricultural land is issued by the state to guarantee the right to food as the human right of every citizen as well as to realize food resilience, estate, and sovereignty. At the same time, it is expected to realize the farmers' prosperity, especially the weak. However, since this policy was implemented in 2009, there is no record of success until today. Thus, the earnestness of the government of this state in carrying out the mandate regulated in Law Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land is in question.

The latest study related to sustainable agriculture in Indonesia concerns agricultural land that has very complex environmental problems, and the study on hilly land covers different problems compared to other types of areas (Juhadi et

al., 2020). In Kulonprogo, sustainable agriculture is a cultural heritage (Rijanta, 2018). Meanwhile, Prasada and Masyhuri studied the conversion of agricultural land (Prasada & Masyhuri, 2019), concerning the farmers' perceptions of sustainable agriculture (Oktarina & Malini, 2021). All the studies above definitely approve that sustainable agriculture is an idea for developing food estate that must be fully supported. Although some areas experience problems, including natural conditions, policy support and the fulfillment of infrastructure and facilities, support for the farmers' resources need to be considered.

Other countries, for example European Union, concern agricultural sustainability by measuring the ten dimensions of sustainability (Magrini, 2022). In Vietnam, sustainable agriculture uses an integrated agriculture-aquaculture farming system (Dang, 2020). Sustainable agriculture in America focuses on sustainable intensification to improve resource efficiency (Konefal et al., 2014). Based on the studies conducted by (Hagggar et al., 2021) and a study conducted by (Lamboll et al., 2021) in Africa as well as a study conducted by (Silvestri et al., 2021) in Tanzania, global sustainable agriculture is supported by almost all countries. The agricultural system aims to deal with the global situation regarding the price escalation.

Material and Methods

In qualitative research, it is based on contextual issues that are the center of the strategy and there is a hidden agenda brought by the researcher. However, this does not reduce the values of the code of ethics that are built in qualitative research as the basis for researchers in approaching social phenomena so that they come to the surface by themselves (Shaw & Gould, 2001). The data that will be explored in this qualitative research is in the form of secondary data published by the national statistical center agency. After the data is obtained, it will be processed using reference studies related to policies in the agricultural sector.

Literature Review

Sustainable (agricultural) development is the realization of the ideal, fair and prosperous conditions, and prevention of the calamity of poverty (Kociszewski, 2018), so that agricultural development is considered as the global basic principles of agriculture development, including in Indonesia. Therefore, the development of agricultural systems towards sustainable farming is one of the main missions of agricultural development in Indonesia (Leimona, 2022).

There are four principles of sustainable agriculture.

Economic feasibility means that farmers have positive income, as form of wages from the labor they have devoted,

which will be used as costs to ensure the welfare of the family of the farmers.

Ecological and eco-friendly agriculture. The agricultural system at least provides food and other basic needs for farming families; ecological and eco-friendly agriculture. Environmentally-friendly agricultural systems are integrated for a wider ecological, focus on maintaining natural resources and biodiversity as well as avoid the activities that can cause negative environmental impacts. One of the environmental management efforts, especially for farming communities, is the re-implementation of the system of ecological agriculture activity. The dependence of farmers on the presence of seeds, chemical fertilizers and chemical pesticides has caused farmers' lives, as the main producers of staple foods, to never improve (World Bank, 2021).

The socially acceptable agricultural system can be observed from the attitude of respecting dignity, individual rights, and group rights, treating them well and fair, opening access to information, markets and other related agricultural resources, especially land. Equal access is also provided for all genders, social institutions, religions, ethnicities and justice for the current and future generations. The distribution of labor on sustainable agriculture can be distributed from year to year. The equality of labor distribution among family members is an indicator of human productivity in agriculture. It is important to make sure that all of the family members are productive.

The agriculture system believing in cultural fit considers cultural values such **as religion and tradition in building its agricultural system, plan, and program**. The local wisdom as a cultural element is not supporting sustainable agriculture unless it is established deeply and practiced in society.

Different from the previous definition, sustainable agriculture needs changes, especially in its institutional management aspect. The management changes include the adjustment of the financial management system, government political management, social system, and agricultural technologies. All of the changes have to integrate three stakeholders including society (farmers), government, and the private sector. It is important to immediately change the regulations inhibiting advances in agriculture. It is necessary to help farmers to access loan programs with low interest. Based on previous concepts on sustainable agriculture, the researcher concludes that sustainable agriculture has to meet the main indicators namely economic, ecological, and social feasibility.

The economical feasibility shows that sustainable agriculture can provide proper life for agricultural workers, especially the farmers. They can fulfill their daily needs (Ariani, 2022). The ecological feasibility shows that sustainable agriculture can maintain the field fertility so the field can be used for a long period until the next generation. The agricultural

products do not lessen due to the field fertility balance and farmers can grow various plants in the field.

Meanwhile, the social feasibility shows that sustainable agriculture is socially accepted by the society as a proper and promising occupation and it prevents “waithood” phenomena, delay in house purchase and marriage usually due to work (Jibril, 2011).

Generally, adopting sustainable development basic principles, the sustainable agriculture system has to meet the following three basic principles. To be sustainable, farming has to be profitable economically. Sustainable agriculture can improve economic feasibility in many ways. In brief, good land management and plant rotation will increase production, in the short and long term. Furthermore, the increasing land quality and water availability also bring benefits to the environment. Economic feasibility can also be achieved by reducing machinery use and chemical fertilizer and pesticide cost (which are not affordable for most farmers), depending on the characteristic of its production system.

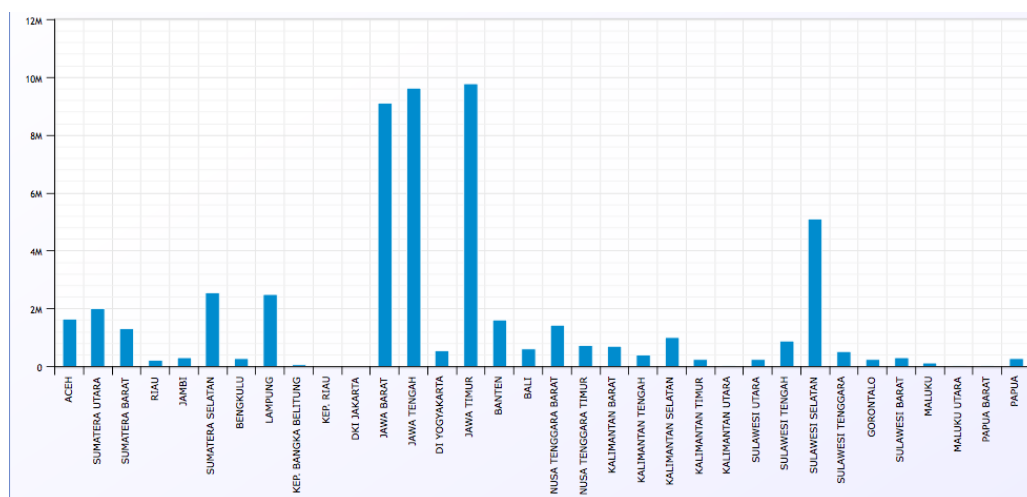
Environment sustainability. Sustainable agriculture is often described as an activity that is ecologically proper and has little or even no negative impact on the natural ecosystem. It even repairs the environment quality and natural sources needed by agricultural activities. This sustainability can be achieved by protecting, recycling, replacing and/or maintaining the natural source base such as soil, water, biodiversity, and wildlife contributing to natural capital protection. Synthetic fertilizer can be used as a supplement for natural input if necessary. In sustainable agriculture, the use of chemicals should be avoided or optimally reduced since they are dangerous for soil organisms, soil structure, and biodiversity.

Social sustainability. It is related to the life quality of those who work and live in the agriculture sector, and also the local society. It includes equal income for different stakeholders in the agricultural production chain. In the context of high unemployment, sustainable agriculture promotes its added value for more society members through high employment and it also increases social cohesion and equality. Other social elements are a proper treatment of workers and buying materials locally.

Result and Discussion

The success of agriculture development is highly determined by good land use planning and land use. The determination of Sustainable food agricultural land (LP2B) as stated in Law number 41 of 2009 is a government effort to conserve agricultural land to avoid land conversion. However, in practice, the economic growth occurs through plantation expansion for palm commodities and mining expansion (Nugraha & Rudiarto, 2017). The implementation of the law is started by making the planning and determination of sustainable food agricultural land, inside and outside the farming area.

Graphic 1 shows that the highest number of harvested area, production, and paddy productivity is from the province of West Java, Central Java, East Java, and South Sulawesi. The production average of these provinces ranges from 5 to 9.7 million tonnes. The area development and sustainable food agricultural land are through intensification and extensification. The area intensification can be done through soil fertility improvement, seed quality improvement, plant diversification, irrigation building, technological development, innova-



Graphic 1. The Harvested Area, Production, and Paddy Productivity Based on Provincial Production (tonnes) 2021, 34 Provinces
Sources: BPS, 2022

tion development, extension system, capital access guarantee, and plant pest prevention and management. Meanwhile, the extensification of sustainable food agricultural land is done using land opening, the determination of food agriculture land to be a sustainable one, and the conversion of non-food agriculture land to be sustainable food agriculture.

The conservation of sustainable food agricultural land (Sutrisno & Setiawan, 2018) aims to realize the food resilience, food estate, and food sovereignty completed with an enforcement element in the form of sanction for anyone who converts the land to be non-agricultural one. Moreover, the policy mentions incentives and disincentives for the farmers. However, the policy is inseparable from the supporting regulations of space planning. Second, the implementation of sustainable food agricultural land conservation policy in Indonesia is stated in local regulations concerning space planning. However, the low space planning is caused by many factors, mainly due to the unawareness of the local government. Meanwhile, the central government has reencouraged the policy. The speed of agricultural land conversion from paddy fields to non-paddy fields is 187 720 ha per year. It comprises the conversion to non-agricultural land for 110 164 ha per year and the conversion to other cropland is 77 556 ha per year. Furthermore, the conversion of agricultural dry land to non-agricultural one is 9152 ha per year (Graphic 2).

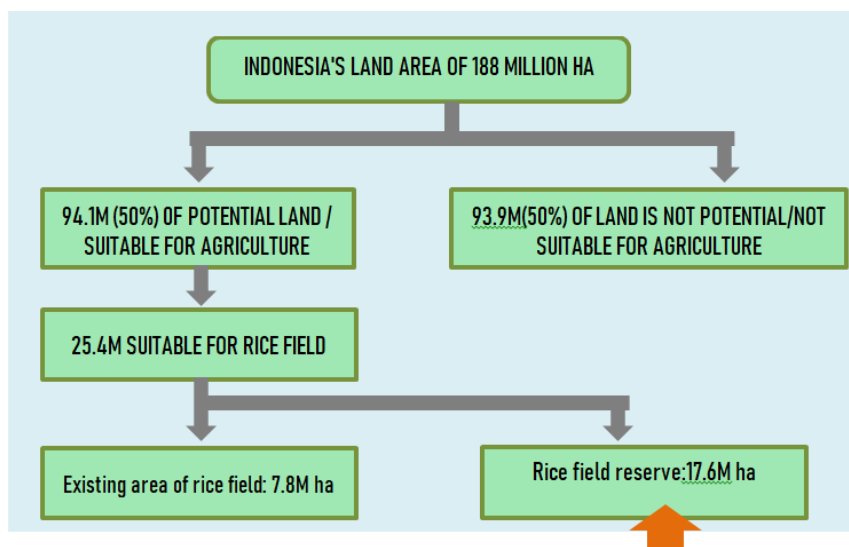
For this reason, the direction of policies and strategies for protecting sustainable food agricultural land includes securing technical irrigated paddy fields (Abdulrachman, 2013) supported by conversion control, one of which is through the establishment of Sustainable Food Agriculture Areas (KP2B) accompanied by price policy and subsidy target improvement

based on farmer s' data, as well as expansion of new paddy fields and the utility of abandoned land, marginal land, land in transmigration areas, plantation land, and ex-mining land to support the increase in rice production Protection of food agricultural land is an integral part of agrarian reform. The agrarian reform includes arrangements related to control/ownership and aspects of domination/utilization as stipulated in Article 2 of Decree of the People's Consultative Assembly of the Republic of Indonesia Number IX/MPR-RI/2001 concerning Agrarian Reform and Management of Natural Resources.

If the loss of productive agricultural land is not controlled, it will disrupt the continuity and production. It can eventually lead to the threat of food estate, both at the regional and national level. Besides the production supply function, agricultural land also has various other functions, namely as a provider and opening of employment opportunities, environmental function, and water catchment area function. This conversion of agricultural land causes the loss of these other functions.

Increasing Food Production

One of the reasons for the difficulty in increasing national food production is the development of new food agricultural land is not balanced with the conversion of productive agricultural land into other functions such as settlements. Agricultural irrigated land in Indonesia is 4.76 million ha, with total rice production in 2015 of 75 397 841 tonnes, and 50% contributed by Java Island (BPS, 2022). However, because of the dense population on Java, the existence of these food crops land is degraded continuously along with increasing housing needs, and choice for commodities that have higher economic value



Graphic 2. Potency of agricurltural land

(Nurhayati, 2019). If there are no special efforts to increase food agricultural productivity, it is certain that domestic food production will not be able to meet national food needs.

Dryland in Indonesia is +8 million hectares, most of which is idle land and marginal land, so it is not productive for food crops. Due to economic pressures and demands looking for a job, people who live around the forest, have no other choice to use critical land and dryland for food farming, such as corn, huma rice, soybeans, and peanuts. Naturally, it helps to increase the area of food agricultural land, although it is realized that the productivity of the land is still low, its utility has a positive impact on increasing food production. Based on the fact above, the best solution is: First, the government should provide legal protection for land management rights that have been worked on the farmer, such kind of the Right to Cultivate (HGU) for the productive business of food farming. Thus, farmers can contribute in the form of taxes for business and the use of the land. Second, the government should provide guidance on agricultural technology, particularly the use of organic and biological methods to enhance soil fertility and assure ecologically friendly and sustainable farming. Third, the government should involve stakeholders and the private sectors who commit. Dryland management for agriculture can be done by applying organic productivity technology to make a real contribution to increasing food production and social welfare.

Placing food as part of the interests of the people, nation and state, and also a sense of nationalism to protect, love and improve local food production must continue to be developed (FAO, 2017). Food farming, including in transmigration areas, should not be viewed as a place to absorb labor, or farmers are conditioned to continue to provide subsidies for economic growth in other sectors with pressure on the low selling value for their products, but the cost of production facilities continuing to soar. Food farmers should get priority protection from the government through selling prices and production subsidies because they carry a mandate for food estate. They need to get decent welfare (Tranggono, 2020). In this case, it is reasonable that the government tends to side with farmers and agricultural food production actors because they are the largest group of Indonesian society.

Government should be creating and realizing national food resilience to more focus on the role of farmers and stakeholders who oversee the production system from ensuring the provision of technology, and production facilities to downstream industries. Policy facilities that make it easy for food farmers to get technology subsidies, mechanization and facilitation of supporting cultivation (such as infrastructure for agriculture such as irrigation and roads, and production credit), market protection and limited import policies, are needed to revive

food farming (Erwidodo, 2022). In this case, it is necessary to have clear and systematic plans and guidelines as a commitment to stakeholders, especially from the government through the relevant department in realizing strong national food resilience as a national decision supported by local governments as executor in the field.

The effort to create food resilience by developing the production of alternative food sources to substitute imported food is carried out in line with the promotion of the three main food commodities above. Carbohydrate food sources can be used to substitute imported foods such as potatoes, white corn, and tubers (Chaudhry, 2022). Developing alternative food sources has a high economic value, because, besides the high productivity per hectare, this food is used as industrial raw material. The diversity of food sources, that can be consumed and can be produced domestically, is hoped that it can significantly reduce imported food and reduce food dependence from abroad, so that national food security and food resilience will be more stable.

Conclusion

Since Indonesia's agricultural land is very wide, agricultural development should be the main focus of the national development plan. Agricultural businesses have various ways and methods, but sustainable agriculture methods are a very strong strategy choice in overcoming various problems in agricultural production. Sustainable food agriculture is the method that must be mobilized. This effort is needed to become food resilience in the domestic area to encourage food production surplus. From this reference study, this research can illustrate that strategy for sustainable agriculture has a large impact on the country's economy. The data shows that our food import is quite high, while our food export capacity is quite low. because of it, our country will depend on imported food sources from other countries. This research can encourage sustainable agricultural policies that must be immediately supported and implemented in society. Using a sustainable agricultural strategy provides opportunities for sufficient food availability, and the economic value of agricultural products, and reduces production costs from the ongoing agricultural production process. This research gap is the data only limited to general data. Thus, further researchers can provide further information to produce better work.

References

- Ario, T. (2020). Strategy Paper Indonesia Sustainable Food System can be accessed at <https://panganbijak.org/wp-content/uploads/2020/10/Strategy-Paper-ISFS-ENG-0510-min.pdf>

- Bayu, T.** (2020). Review on Contribution of Integrated Soil Fertility Management for Climate Change Mitigation and Agricultural Sustainability. *Cogent Environmental Science*, 6 (1). Taylor and Francis Ltd. doi:10.1080/23311843.2020.1823631.
- Dang, H. D.** (2020). Sustainability of the rice-shrimp farming system in Mekong Delta, Vietnam: a climate adaptive model. *Journal of Economics and Development*, 22(1), 21-45. <https://doi.org/10.1108/JED-08-2019-0027>
- BPS.** (2022) from <https://www.bps.go.id/subject/153/geografi.html#subjekViewTab5>. Accessed on March, 30, 2022
- Nugroho, D., Siswanti, S.** (2015). Study of the Utilization of Information Technology in the Field of Agriculture to Support Sustainable Development. *Jurnal Ilmiah SINUS*, 13(2).
- Ely, N.** (2019). Analysis of Indonesian Nutmeg, Lawang and Cardamom Export Development. *Jurnal Ekonomi dan Pembangunan Indonesia*, 19(2), 173–190.
- Erwidodo** (2022) Policy on Imports, Food Reserves, Price Stabilization and Self-Reliance National Food Security. can be accessed at <https://www.litbang.pertanian.go.id/buku/swasembada/BAB-III-3.pdf>
- FAO** (2017). The future of food and agriculture – Trends and challenges. Rome. Accessed at: <https://www.fao.org/3/I6583e/I6583e.pdf>
- Andy, S., Bakti, S.** (2018). Sustainable Urban Agricultural Land Protection Policy: The Case of Surakarta City, Central Java Province, Indonesia. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, 2(3), 227-240. <https://doi.org/10.36574/jpp.v2i3.48>
- Ghaffar, C.** (2000) Agrarian Reforms and Agricultural Productivity Report of the APO Study Meeting on Agrarian Reforms and Agricultural Productivity, Asian Productivity Organization.
- Haggard, J., Nelson, V., Lamboll, R., Rodenburg, J.** (2021). Understanding and informing decisions on Sustainable Agricultural Intensification in Sub-Saharan Africa. *International Journal of Agricultural Sustainability*, 19(5-6), 349-358, DOI: 10.1080/14735903.2020.1818483
- Jibril, A.** (2011). The Concept and Principles of Sustainable Development. Can be accessed at https://www.researchgate.net/publication/332593288_THE_CONCEPT_AND_PRINCIPLES_OF_SUSTAINABLE_DEVELOPMENT
- Juhadi, J., Banowati, E., Tjaturahono, B. S. & Satya, B. N.** (2020). Rapid appraisal for agricultural land utilization in the erosion and landslide vulnerable Mountainous Areas of Kulonprogo Regency, Indonesia. *Management of Environmental Quality: An International Journal*, 31(1). Emerald Group Holdings Ltd.: 1–17. doi:10.1108/MEQ-01-2019-0023.
- Kociszewski, K.** (2018). Sustainable development of agriculture: Theoretical aspects and their implications, Economic and Environmental Studies (E&ES), ISSN 2081-8319, Opole University, Faculty of Economics, Opole, 18(3), 1119-1134, <http://dx.doi.org/10.25167/ees.2018.47.5>
- Konefal, J., Hatanaka, M. & Constance, D. H.** (2014). Patchworks of Sustainable Agriculture Standards and Metrics in the United States. *Alternative Agrifood Movements: Patterns of Convergence and Divergence (Research in Rural Sociology and Development, 21)*, Emerald Group Publishing Limited, Bingley, 257-280. <https://doi.org/10.1108/S1057-192220140000021011>.
- Lamboll, R., Nelson, V., Gebreyes, M., Kambewa, D., Chinsinga, B., Karbo, N., Rukonge, A., Sekeleti, M., Wakun'uma, W. L., Gutema, T. H., Henjewe, M., Kampanje-Phiri, J., Masikati-Hlanguyo, P., Quaye, W., Duah, S., Kivuyo, M., Nyanga, P., Essilfie, M. A., Asafu, A. C. V., Martin, A.** (2021). Strengthening decision-making on sustainable agricultural intensification through multi-stakeholder social learning in sub-Saharan Africa. *International Journal of Agricultural Sustainability*, 19(5-6), 609-635, DOI: 10.1080/14735903.2021.1913898.
- Magrini, A.** (2022). Assessment of agricultural sustainability in European Union countries: a group-based multivariate trajectory approach. *AStA Adv Stat Anal*. <https://doi.org/10.1007/s10182-022-00437-9>
- Mariyono, J., Hanik, A. D., Putu, B. D., Evy, L., Arief, L. H. & Gregory, C. L.** (2020). Farmer Field Schools for Improving Economic Sustainability Performance of Indonesian Vegetable Production. *International Journal of Productivity and Performance Management*. Emerald Group Holdings Ltd. doi:10.1108/IJPPM-09-2019-0445.
- Ariani, M.** (2022) Efforts to Improve Community Food Access to Support Food Security. Acces from <https://www.litbang.pertanian.go.id/buku/swasembada/BAB-IV-2.pdf>
- Oktarina, S. & Henny, M.** (2021). Farmers Perception and Sustainability Strategy On Agricultural Development Program In Rural. *Journal Social Economic of Agriculture*, 10(1), 11-22. <https://doi.org/10.26418/j.sea.v10i1.45007>.
- Prasada, I. Y. & Masyhuri, M.** (2019). Farmers' willingness to accept a compensation to protect Agricultural Land Sustainability in Peri-Urban Areas of Pekalongan City. *Agro Ekonomi*, 30 (2). <https://doi.org/10.22146/ae.48869>.
- Rijanta, R.** (2018). Sustainability of the Sawah Surjan Agricultural Systems in Depok Village, Panjatan Subdistrict, Kulonprogo Regency, Yogyakarta Special Province. *Forum Geografi*, 32 (2). <https://doi.org/10.23917/forgeo.v32i2.5798>.
- Sambari, H. R.** (2020). Pertanian Dan Industri: Prospek, Strategi, Dan Kebijakan Di Masa Depan, Prenada Media /Kencana, 2020.
- Abdulrachman, A.** (2013) *Integrated Crop Management Irrigated Paddy Field Ministry of Agriculture*. Agricultural Research and Development Agency. From web <https://sippn.menpan.go.id>.
- Shaw, I. & Gould, N.** (Eds.) (2001). *Qualitative research in social work*. SAGE Publications Ltd <https://dx.doi.org/10.4135/9781849209694>.
- Silvestri, S., Musebe, R., Baars, E., Ganatra, D. & Romney, D.** (2021). Going digital in agriculture: how radio and SMS can scale-up smallholder participation in legume-based sustainable agricultural intensification practices and technologies in Tanzania. *International Journal of Agricultural Sustainability*, 19(5-6), 583-594, DOI: 10.1080/14735903.2020.1750796.
- World Bank** (2021). Sustainable Lowland Agriculture Development in Indonesia. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/36223> License: CC BY 3.0 IGO.”