

Comparison of agricultural extension during the covid-19 pandemic in various countries (meta-synthesis)

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ABSTRACT: The objective of this study was to compare agriculture extension in different countries during the pandemic COVID-19 era. The study was conducted by comparing agricultural extensions in Africa, the United States, India, and Indonesia. Data were obtained from journals, scientific articles, and scientific reports. The source of data was collected and selected by the characteristic of inclusion. According to the characteristic of inclusion 7 sources of data were obtained and analyzed using systematic review and meta-synthesis method. Extraction source of data shows that agriculture extension in various countries experiencing different challenges due to the COVID-19 pandemic era, such as mobility restriction, differences of agriculture system, lack of facilities, false information spreading and lack of extension worker and farmers' ability to access the internet. Due to mobility restrictions, many countries choose ICT (information and communication technology) as a new method and media for advisory service during the pandemic. The majority of the country used simple apps for farmers like Whatsapp, virtual meetings via zoom, website, and YouTube. Most countries switched to cyber extensions to prevent the virus from spreading. India and Africa increase their extension facilities and provide Q&A (question and answer) platform that is easy to use by farmers. Developing countries like Africa, India, and Indonesia provide training for extension agents to improve their ability to access the internet and gadgets, thus, they can improve their ability and provide knowledge to the farmers durin pandemic.

Keywords: Agriculture extension; COVID-19; Internet; Cyber Extension

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INTRODUCTION

The agricultural sector which includes agriculture, plantations, animal husbandry, fisheries, and forestry is the main source of food in Indonesia, so the development and progress of the agricultural sector is a great concern. Development and progress efforts are then carried out in various ways, one of which is by conducting outreach activities to reach people in agricultural areas so that developments and advances in the form of new knowledge or technological innovations can reach farmers, breeders, and fishermen.

Extension activities can be defined as the form of information-dissemination through communication that is carried out either in one way or in group discussions in a systematic and focused manner. Extension is an effort to change human behavior for the better to improve skills, income, and community welfare. Sikhondze (1999) states that extension must be oriented towards helping the target so that they can empower themselves with existing innovations, delivered by methods that are practical in individual and group services.

According to the Law of the Republic of Indonesia No. 16 of 2006 agricultural, fishery, and forestry extension is the entire series of capacity development, knowledge, skills, and attitudes of the main actors and business actors through extension. Extension activities are then defined as learning activities as the main actors' efforts to be willing and able to help and organize themselves to access information, technology, capital, and resources to increase the productivity, income, and welfare of the actors themselves. Agricultural and animal husbandry extension activities are generally carried out by the government and private institutions to provide information or an introduction to programs and the achievement of certain goals. Extension activities in Indonesia and even the world have undergone many changes since the outbreak of the COVID-19 virus pandemic.

Changes in pattern occur along with the implementation of new habits (new normal) to prevent the spread of the virus.

WHO (World Health Organization) (2020) states that coronavirus or COVID-19 can spread through droplets from infected people to other healthy people, so WHO recommends not to gather in crowds and maintain a safe distance of at least one meter. This certainly affects the continuity of extension activities, as it is known that extension activities in Indonesia are generally carried out in groups or individual visits which cannot be carried out during a pandemic.

The most significant change is of course the strategy for implementing safe extension and guided by health protocols and existing regulations, it is necessary to make changes in extension methods and extension media. The limitation of extension agents to provide material directly becomes a challenge in the preparation of extension programs, so appropriate strategies are needed to be able to reach the agricultural community and carry out the role of extension in providing information on new knowledge or innovations. This is expected to help farmers and ranchers to maintain their survival and to maintain production in the agricultural sector during the pandemic.

MATERIALS AND METHODS

The research design is a systematic review with the meta-synthesis method. A systematic review is a description of theory or findings based on reference materials in the form of books, journals, or other literature to be used as the basis for research activities. Siswanto (2010) explains that a systematic review is a secondary study design carried out by identifying, evaluating, and interpreting several studies that have relevant topics or questions so that comprehensive and balanced facts are obtained.

The systematic review basically can be done with several methodologies such as meta-analysis and meta-synthesis, in this

study the meta-synthesis method is used to synthesize literature data in the form of qualitative studies.

Research stages

A. Systematic review framework

The preparation of a systematic review is carried out using a protocol consisting of 7 elements, namely:

1. Background (background determination)

Determining and compiling the background is the first stage in conducting a systematic literature review. Agricultural extension during the COVID-19 pandemic was the topic behind this research. The implementation of extension with the challenges faced during the pandemic and the strategies used in dealing with agricultural extension can continue to be carried out properly as a background which is then studied in research.

2. Research Question (Identification of problems)

Problem identification is carried out to determine the problem on the topic so that it can then be measured and explained by research procedures and is expected to be solved. This study found challenges in the sustainability of agricultural extension and the strategies used in the implementation of agricultural extension. The identification of the problem is then systematically reviewed through the literature in the form of journals and previous scientific articles that have relevant themes or topics. The results of the study can be expressed as a problem formulation.

3. Search terms (literature search)

The literature search in this study was carried out by digital search which is an academic database, namely: Google Scholar, Semantic Scholar, and Elsevier. Based on the research topic and problem identification, a search for journals and articles was conducted with the keywords: agricultural extension, COVID-19 pandemic, and agricultural extension and pandemic.

4. Selection criteria (Selection of journals based on criteria)

Journals and scientific articles used as data sources are selected strictly based on predetermined criteria. Journals that have been obtained based on predetermined keywords are then selected that meet the criteria, namely journals that can be accessed in pdf form, published within the last three years (2019-2021), and written in both Indonesian and English. Journals that do not meet the criteria are then excluded from the data source.

5. Quality checklist (Quality assessment)

Determination of the quality of journals used as data sources is carried out by strict selection based on inclusion criteria. In addition, the journals used are qualitative and empirical studies that have themes that are relevant to the research themes, namely challenges and strategies for agricultural extension during the COVID-19 pandemic so that they can be analyzed further. The quality of data source journals is also seen from the clarity of research objectives, having clear research variables, collecting and processing data that is carried out correctly, and is a credible data source. The credibility of the data source in this study is determined by looking at the credibility of the author or the agency publishing the data source, which must be higher than the ranking of the research institution, namely Universitas Brawijaya or indicated by Scopus.

6. Data extraction strategy

Journals and scientific articles that have gone through a selection and quality assessment process are then critically extracted to find important points as data used in research. The important points that have been found are summarized and then synthesized to conclude.

7. Data synthesis

Data synthesis was carried out using the meta-synthesis method to synthesize qualitative data and then explained in the form of a narrative. Data in the form of important research points, facts, and information are grouped in tables that are sorted alphabetically. The data is then studied in-depth, found similarities,

compared, and presented as a synthesis result to conclude so that it can answer questions or problem formulations.

B. Determination of data sources based on inclusion criteria

Determination of the journals used as literature is done by selecting based on the inclusion and exclusion criteria that have

been applied. The inclusion criteria use the PICO framework to make it easier for authors to get data sources that reference the best data sources to be analyzed in depth so that quality data and exposure are obtained (Nasution, 2017). The inclusion and exclusion criteria applied can be seen in table 1.

Table 1. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Problem	Sources of scientific data discussing the implementation of agricultural extension during the COVID-19 pandemic	Not a source of scientific data that discusses the implementation of agricultural extension during the COVID-19 pandemic
Intervention	Continuity of agricultural extension activities during the COVID-19 pandemic	Not the continuity of agricultural extension activities during the COVID-19 pandemic
Comparison	There are factors of similarities and differences	There are no similarities and differences faktor
Outcome	There is a strategy applied to agricultural extension during the COVID-19 pandemic	There is no strategy applied to agricultural extension during the COVID-19 pandemic
Study Design	Research using experimental study methods, survey studies, qualitative analysis, scientific reports and scientific articles	In addition to research using experimental study methods, survey studies, qualitative analysis, scientific reports and scientific articles
Publication Year	Journal published in 2019 to 2021	In addition to journals published in 2019 to 2021
Language	Indonesian and English	Apart from Indonesian and English
Quality	The quality of the data source is obtained from the author or publishing agency accredited above Brawijaya University or indexed by Scopus and SINTA	Sources of data from authors or publishing institutions that are accredited lower than Brawijaya University or not indexed by Scopus and SINTA

After the selection based on the inclusion criteria, 7 seven data sources were obtained, namely:

1. Women's Access to Agriculture Extension Amidst COVID-19: Insights From Gujarat, India And Dang, Nepal (2021)
2. Digital Information Development In Agriculture Extension In Facing New Normal Era During Covid-19 Pandemics (2020)
3. Extension And Advisory Services: Supporting Communities Before, During, And After Crises (2020)
4. Agricultural Extension in Efforts to Empower Farmers in the Era of the Covid-19 Pandemic (2020)
5. COVID-19 and Agriculture in Africa: Implications For Digitalisation (2020).
6. ICT Intervention in Delivery of Advisory Services During Pandemic Of Covid-19: A Case Study (2020)

7. Agricultural Extension and Advisory Services: Serving Farming Community By Agripreneurship Amid COVID-19 (2020)

C. Data synthesis

Journals that have been determined based on inclusion criteria are synthesized using the narrative method. The core of the journal according to the theme and research variables was extracted and then grouped into a summary based on the name of the researcher, year of publication of the journal, research title, research methods, and a summary of the findings or results of the research. These extraction points are written in the table according to the alphabet and the format that has been determined.

The summary results from the journals that have been obtained are then analyzed carefully and thoroughly. This summary is the core of the results or findings from literature that are by the theme and research variables to answer the formulation of the problem. The results of this analysis are then collected to find comparisons and then conduct a discussion to conclude.

RESULT AND DISCUSSION

A. Challenges of agricultural extension in the pandemic period

1. Mobility restrictions

The restrictions on mobility recommended by the WHO (World Health Organization) to prevent the spread of the COVID-19 virus hinder the implementation of agricultural extension. Based on the data sources, it is known that the restrictions are on a scale carried out in Indonesia and the United States so that the implementation of agricultural extension experiences changes in frequency and method. India and several countries in Africa have implemented a total lockdown which has made access to agricultural extension very difficult to reach, especially for farmers and small farmers.

2. Extension system

The agricultural extension system in the United States is prepared to deal with the changes that occur due to the pandemic. The United States Department of Agriculture

works with agricultural extension agencies to provide services to the people most vulnerable and most impacted by the pandemic and then provides an online platform to easily access information about agriculture and the pandemic. The platform provides access to ask questions that can be responded to quickly.

Agricultural extension systems in developing countries such as Indonesia and India tend to be unprepared for a pandemic. Based on data sources, it is known that agricultural extension in Indonesia is experiencing obstacles in dealing with the pandemic due to limited extension components in the implementation of the internet-based extension. Indraningsih, et al. (2013) states that the extension system, especially in Indonesia, is still very weak. The extension is still considered as a "tool" to achieve the target of increasing production that has been set by the government. Things that need to be changed in extension activities are extension materials and methods because if the agricultural extension system is not accompanied by agricultural transformation, it will be difficult for agricultural extension to be relied on as an instrument for changing the agricultural system.

Agricultural extension in several regions of India according to Alvi's research, et al. (2020) female farmers in the Gujarat region, India have difficulty accessing information provided by extension agencies during the pandemic due to the enactment of lockdown. The study also said that women farmers in Gujarat had difficulty getting access to the agricultural extension even before the onset of the pandemic, so it can be said that the agricultural extension system in some parts of India was not prepared to deal with the pandemic.

3. Facilities and infrastructure

Several developing countries such as Africa, India, and Indonesia are experiencing difficulties with facilities and infrastructure in the implementation of internet-based agricultural extension (cyber extension). Since there are limited tools such

as computers or gadgets owned by extension workers and farmers. The limited availability of signals in rural areas also makes it difficult for farmers to access cyber extension and access information via the internet.

4. Trusted source of information

The flow of information regarding the spread of the COVID-19 virus spread quickly to all levels of society, including the agricultural community. Information about the pandemic that spreads indirectly affects the lives of farmers, especially the amount of information that cannot be confirmed or is false (Hoax). This false information has a negative effect on society, causing panic and unrest in the community. This is explained by Raj and Darekar (2020) that inaccurate and misinformation regarding the spread of the coronavirus has created panic in rural communities in India thereby creating a negative and suspicious environment. This reduces public confidence in extension services. This is not only happening in India but the spread of false information is also happening in the United States, Africa, and especially in Indonesia.

5. Human resources

The limitation of competent human resources in the implementation of internet-based agricultural extension (cyber extension) is a challenge in some countries. Based on the analysis of literature, it is stated that the frequency of using gadgets (smartphones) is very low in the group of farmers in the research area (Bogor, Indonesia). This is because most farmers cannot operate the lack of use of technology in small-scale farmers, in addition. After all, most of the farmers are elderly. The use of information and communication technology by these farmers is usually accompanied by their children or relatives. The data obtained in the research of Indraningsih, et al. (2020) explained that the capacity of extension agents was very limited both in quality and quantity, most of the extension agents did not have the competence in implementing online agricultural extension.

Based on the data presented by Alvi, et al. (2021) the majority of women farmers in Gujarat have a low level of education so that their ability to access information and communication technology is limited. This is still strongly influenced by the caste prevailing in India so that low-caste citizens find it difficult to access education and access to technology, especially the internet.

B. Agricultural extension strategy during the pandemic

1. Methods and media

Countries affected by the pandemic carry out different strategies in implementing agricultural extension. Changes in methods and media are important aspects most affected by the pandemic. Agricultural extension in Indonesia is still a small part of direct extension by making individual visits or with limited members, then still using print media such as pamphlets to provide information to farmers. The Ministry of Agriculture and government extension agencies are aggressively providing briefing and information through virtual discussions and promoting virtual extension programs cyber extension in the website such as CYBEXT and AOR programs (Agriculture Operation Room). Utilization of information and communication technology such as applications WhatsApp and telegrams used as liaisons between extension workers and farmers.

Agricultural extension in India uses print media in the form of agricultural magazines and newspapers to provide information to farmers. Simple communication apps like WhatsApp and telegram are used to provide virtual extension, extension is also carried out using video distributions such as YouTube, Zoom, and Skype. In addition, the Indian government is also developing an application that helps agricultural communities if there are farmers who are infected with the virus and assists farmers in facilitating the purchase of products and transportation of sales of crops.

Africa provides IVR (interactive voice responses) as a medium for distributing information that is easily accessible by extension workers and farmers. The technology works automatically to answer questions over the phone with the options provided. Farmers' questions will then be answered by the call centre then recorded and saved as data (Muyiramye and Addom, 2020). Radio and videos offline provided on the CD became one of the media used for extension in Africa.

The United States Department of Agriculture and agricultural extension agencies use the online platform as a website developed as a medium for distributing information. Website The American Ministry of Agriculture provides a column for direct inquiries and then there is service pandemics assistance which provides programs that can help farmers and ranchers during the pandemic that are supported by funding.

2. Extension of extension materials

In times of a pandemic like today, additional information is needed because the entire community, including the agricultural community, is experiencing the impact of the economic downturn. This is due to restrictions such as lockdown so that transportation for buying and selling is hampered. Therefore, materials that contain information needed by farmers to maintain their business.

Organizers of extension and empowerment agripreneur in India increasing information on basic agriculture by involving practitioners and experts in agriculture, providing information on markets, buying, selling, and shipping. In addition, providing additional skill materials such as waste treatment, mushroom cultivation, and others. Extension agents also provide basic knowledge materials about COVID-19, the spread of the virus, and health protocols to agricultural communities (Raj and Darekar, 2020). Grove, et al. (2020) describes Extension and Advisory Services (EAS) in the United States to quickly respond to global issues

and assist the most impacted communities by providing information about outbreaks, providing education about prevention and impact, also identifying and addressing disruptions to markets and supply chains.

3. Improvement of facilities and infrastructure

This lack of facilities and infrastructure can be found in several developing countries such as Africa, India, Nepal, and Indonesia. The obstacle found was the lack of signal availability to access the internet for agricultural communities in the village. In addition, not all farmers have a device to communicate or access video materials provided by extension workers.

Based on the analysis of literature, it is known that extension services in Indonesia improve facilities and infrastructure for extension workers to reach and serve farmers and ranchers. The facilities and infrastructure provided are related to the implementation of the cyber extension during a pandemic such as computers or laptops, projectors, and internet services. The Ministry of Agriculture is also developing AOR (Agriculture Operation Room) in various regions in Indonesia that provide various supporting facilities cyber extension. The use of digital media makes it easier for farmers to access other farmers, farmers' communication access to extension workers, and communication access to farmer's stakeholders.

4. Improvement of human resources quality

The phenomenon of the COVID-19 pandemic that has hit the whole world and has affected the agricultural aspect has indirectly encouraged the acceleration of the use of information and communication technology. This requires every actor in agricultural activities to adapt to the use of ICT, especially internet-based technology. According to Dharmawan, et al. (2020) in Indonesia the provision of agricultural extension training is carried out to improve the competence of extension agents in the use of online media or online media cyber extension.

This is in line with the Ministry of Agriculture program which is developing an Agriculture Operation Room (AOR) which is a training platform for agricultural extension workers. This training is focused on training extension workers in the use of information technology and technology in the industrial era 4.0 which can be done remotely via the internet (e-learning) which is centered on one AOR which is located in almost all parts of Indonesia.

Similar training was also carried out in India, in the data source Raj and Darekar (2020) the Indian government collaborated with extension institutions by developing training for extension workers and farmers in the form of training agripreneurship. Extension workers will be trained by experts in the field of extension and agriculture such as academics and researchers so that they can convey information about agripreneur and markets to farmers. Farmers then get extension about, information about the pandemic and innovations. Media used mostly through internet-based information and communication technology, especially Whatsapp.

CONCLUSIONS

This study concludes that the implementation of agricultural extension in various countries has experienced obstacles due to the spread of COVID-19. This affects the flow of information from extension agents to community agriculture and other extension services. The spread of COVID-19 has resulted in the emergence of different challenges in various countries which are generally faced with restrictions on mobility, weak extension systems, inadequate facilities and infrastructure, and the lack of readiness of actors in agricultural extension. These challenges hinder the implementation of agricultural extension so that it slows down the rate of information needed by farmers. This then has an impact on other agricultural activities such as production, transportation, and buying and selling.

Affected countries develop agricultural extension strategies by increasing the use of internet-based information and communication technology media (cyber extension) or online to continue to carry out an agricultural extension. Agricultural extension has changed methods and media that utilize technology such as WhatsApp, YouTube, Zoom meeting, interactive voice response (IVR) as well as platform discussion in the form of a web. Quality improvement is carried out in various aspects of extension such as improving the quality of materials, improving the quality of human resources by conducting training, and increasing public confidence in agricultural extension. The strategy carried out has a positive effect so that agricultural extension can still be carried out during the COVID-19 pandemic.

REFERENCES

- Alvi, M., Barooah, P., Gupta, S., & Saini, S. (2021). Women's access to agriculture extension amidst COVID-19: Insights from Gujarat, India and Dang, Nepal. *Agricultural Systems*, 188, 103035. <https://doi.org/10.1016/j.agsy.2020.103035>
- Dharmawan, L., Muljono, P., Retno Hapsari, D., & Priyo Purwanto, B. (2020). Digital information development in agriculture extension in facing new normal era during Covid-19 Pandemics. *Jonuns.Com*, 47(12), 64–73.
- Grove, B., Archibald, T., & Davis, K. (2020). Gap october 2020 extension and advisory services: supporting communities before, during, and after crises. *Global Agriculture Productivity Report*.
- Hadi, S. (2020). *Systematic Review: Meta Synthesis for Organizational Behavior Research*. Eternal Vivavictory.
- Indraningsih, K., Pranadji, T., & Sunarsih. (2013). Revitalization of agricultural extension system in perspective of developing rural agricultural industrialization. *Agro-Economic*

- Research Forum, 31(2), 89–110.*
- Indraningsih, K., Septanti, K., & Ar-Rozi, A. M. (2020). *Agricultural Extension in Efforts to Empower Farmers in the Era of the Covid-19 Pandemic: Impact of the Covid-19 Pandemic: Adaptation Perspectives and Agricultural Socio-Economic Resilience.*
- Muyiramy, D., & Addom, B. (2020). *COVID-19 and Agriculture in Africa: implications for Digitalisation.*
- Nasution, R. E. (2017). *PICO: An Easy Method of Finding Medical Journals.*
- Raj, S., & Darekar, A. (2020). *Agricultural Extension and Advisory Services: Serving Farming Community by Agripreneurship Amid COVID-19.* Telangana: MANAGE.
- Sikhondze, & Wilson, B. (1999). *The Role of Extension in farmer Education and Information Dissemination in Swaziland.* *Edult Education and Development.*
- Singh, R. K., Singh, R. P., Singh, A. K., & Singh, V. P. (2021). *ICT Intervention In delivery of advisory services during pandemic of Covid-19: A Case Study.* *International Journal of Agriculture Sciences, 12(11), 9937–9940.*
- Siswanto, S. (2010). *Systematic review as a research method to synthesize research results (Introduction).* *Buletin Penelitian Sistem Kesehatan, 13(4), 326–333.*
- WHO. (2020). *Coronavirus.*
- WHO. (2021). *Preventing and mitigating COVID-19 at work.*