

## **A Program Of Technology-Based Empowerment For Fish Farmers In Conjunction With Corporate Social Responsibility**

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### **Abstract**

**Objective:** To investigate the relationship between the fish farmer empowerment program and the PT. Multi Dimensi Kreasi (MDK) Corporate Social Responsibility (CSR) program in the fish farming empowerment program in the Bokesan Village, Sindumartani Village, Sleman, Yogyakarta.

**Methods:** Qualitative research methodology is used. Purposive sampling, snowball sampling, and Forum Group Discussions (FGD) is the sample methods used. Techniques for gathering data include interviews, observation, and documentation. Techniques for validating data include using three different sources and procedures. The method of data analysis makes use of an interactive model.

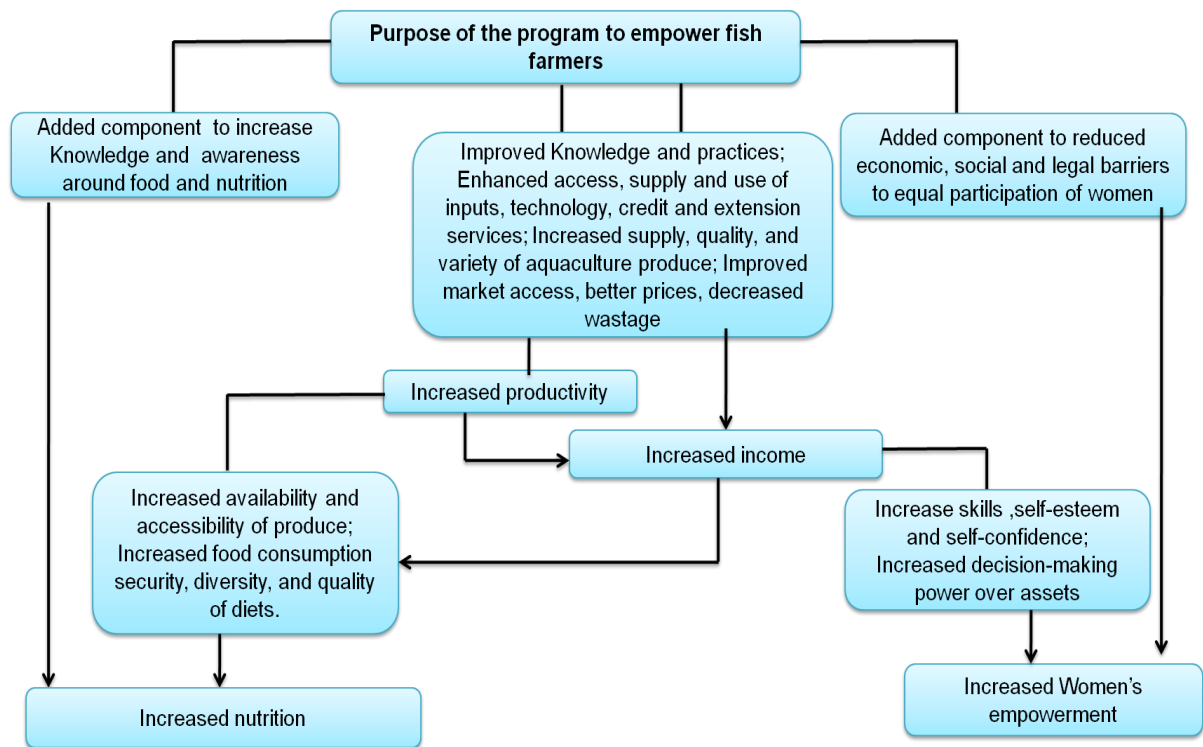
**Results:** (1) The CSR program is run by PT. MDK and fish farmers' empowerment both aim to strengthen the ability of fish farmers, hence they complement one another; (2) Through the use of Micro Bubble Generator (MBG) technology, a program to enhance aquaculture empowers fish breeders; (3) Awareness, ability, and empowerment are the phases of empowerment. **Conclusion:** To develop the community's capability (empowerment), the government can work with private enterprises. This will make the program materials and budget requirements more effective and efficient.

**Keywords:** adoption, Multi Dimensi Kreasi (MDK), Corporate Social Responsibility (CSR), Bokesan Village, Sindumartani Village, Sleman, Yogyakarta

### **Introduction**

Village-based development with fishing potential must be explored for independent communities to prosper. This autonomous community will assure the well-being of its residents in financial, social economic, political, and environmental dimensions. The fulfillment of rural

social and economic equipment and infrastructure, in addition to the rise in society's high economic growth rates and the involvement of public socio-economic organizations in supplying capital for the improved performance of local economic programs and community socio-economic organizations, exemplify the characteristics of independence (Widjaja et al, 2020). The community must be empowered if it is to become more independent. CSR must play a part in community empowerment initiatives. Ardianto and Elvriano (2011) CSR refers to an organization's or the corporate community's commitment to supporting sustainable economic growth and emphasizing consideration of economic, social, and cultural influences. Figure 1 indicates the purpose of the program to empower fish farmers.



**Figure 1:** Purpose of the program to empower fish farmers

One strategy adopted for PT MDK's CSR implementation is community empowerment. The community-based infrastructure project model chosen is expected to prioritize the capacity building of community team members. PT. MDK collaborates with key stakeholders to execute the concept of "community-based development" in to encourage the reality of a society that is independent, educated, and capable of experiencing affluence to live a good life.

To implement local community, there are four main methods to consider: (a) enhancing collaboration with sponsors; (b) bolstering the management solution by improving SOPs and their implementation; (c) boosting human capital quality via implementation, and (d) community development accompanied by assistance. Empowerment is created based on the concept that involvement is the path to empowerment as a kind of civic responsibility (Nasdian, 2014).

There are several issues with fish farmers in Bokesan, including: (1) HR issues, it is challenging for individuals to adopt technological advancements and alter attitudes and behavior when farming fish due to the restricted capacity of human resources. Rigid assistance

and involvement may help the community overcome its lack of understanding, leading to new behaviors and perspectives that support alternative fish farming methods. Freshwater aquaculture in the region was historically powered by windmills, however in 2019 MBG was introduced for use in fisheries cultivation ponds; (2) the soil and water strategic planning availability, particularly since the property for bodies of water is 30 hectares during the monsoon season but only 15-20 hectares during in the dry period. In addition, there are restrictions on arable land due to the conversion of the land into permanent structures; (3) issues with technology, such as the difficulties of public access to cutting-edge technology, such as MBG; and the currently available technology is thought to be difficult to apply to fish farming operations. (4) Self-growing organizations, such as the state, serve to collect information and technical innovation, enabling advising, enabling access to different federal programs, and enabling obtaining financial institutions. Other circumstances must exist for present technology to be deemed too expensive or expensive by economic actors. The institution's issue is that its support for its role is still insufficient, necessitating the strengthening of the institutional function (Pranyoto, 2015). According to Effendi, 2019 was to examine the suitability of an empowerment program for the demands of traditional fish processors. 'The descriptive qualitative approach was used in this study, together with the Context-Input-Process-Product (CIPP) framework and FGD. Observation and interview data were used to characterize different activities'. Ahdan (2019), intends to investigate and compile a record of socioeconomic situations to identify the key elements influencing the income sector of coastal fishermen. Field data collecting instruments comprised surveys and interviews — data gathered by 45 respondents, including five interview respondents, data analysis utilizing variant analysis with the use of SPSS and Microsoft Excel programs to create flowcharts, and a qualitative approach. The purpose of Swastawati, 2018 was to assess the empowerment program for increasing the processing capacity of fisheries products. The application and exploitation of technology and science in the area (IPTEKDA) LIPI Indonesia for Higher Education was the empowerment program. "Lumintu Group" activity in the fish processing business in 2016. The aim of Halim 2019 was to establish a practical definition of small-scale fisheries (perikanan skala kecil) to assist the implementation process to enhance capturing fish production in Indonesia. Small-scale fisheries are defined as fisheries operations conducted at the household scale, fishing using or without a fishing boat of 5 GT, and employing fishing gear operated only by people. According to Ginting 2018 was conducted meet with 10 veteran fishermen, the Fishermen's Group Committee, and government representatives from the Marine and Fisheries Division. Observation, in-depth interviews, and focus groups were used to compile the data FGD. The results of the investigation of the socioeconomic condition of traditional fisherman in Percut Village are poor, as evidenced by indicators such as unfit housing and sanitation for healthy living, inadequate fishing equipment, and overfishing capturing areas. Hinrichsen, 2022 contributes the most to national fish supplies through aquaculture. Lesotho comes in second in this statistic, although the majority of its output is destined for the export market, as seen by the country's poor per-inhabitant fish supply. Ethiopia has the highest disparity between per capita and average African fish supply. Ahmed 2021 was to look at the prospects and difficulties for further RAS implementation before offering some suggestions for aquacultural productivity and global warming adaptability using RAS.

### **Contributions of this research**

- Qualitative research methodology is used. Purposive sampling, snowball sampling, and Forum Group Discussions (FGD) is the sample methods used.

- The method of data analysis makes use of an interactive model.
- To develop the community's capability (empowerment), the government can work with private enterprises.
- This will increase the effectiveness and efficiency of the program materials and financial needs.

The remaining part of this research is divided into 3 sections, section 2: Methodology used; section 3: result and discussion; and section 4: conclusion.

## **Methodology used**

Qualitative research is the research methodology.

- The corporation, namely PT MDK as the owner of the CSR policy authority,
- Sub-district and village administrations, respectively, are the industry research objects and subjects.
- The fish growers' group in Bokesan Village. Purposive sampling, snowball sampling, and forum group discussions were the sample methods employed. Up to 13 sources were used as informants.

Observation, documentation, and interview-based data collecting methods. Method localization and source triangulate are both used in the data validation process. Data reduction, data presentation, data analysis, data conclusion, and data verification are all interactive components of the data analysis process.

## **Result and discussion**

### ***Bokesan Sindumartani Village's fish farming***

According to the Sindumartani Village's (RPJMKal) 2021-2026 Mid-Term Development Plan, the Sindumartani Village was created on May 20, 1946, by combining the three communities of Pencarsari, Jambusari, and Johosari. In December 2020, 8,336 people were living in the Sindumartani Village, with 4,202 women (or 50.40% of the population) and 4,134 males (or 49.60%) making up the remainder. The Sindumartani Village's economy is organized into several sectors. Agriculture, which includes fisheries and cattle, is the principal industry. This is evident from statistics on the number of breeders, which reached 15.59% of the entire population, or as many as 1,300 individuals. In Sindumartani Village, there is a substantial area dedicated to rice fields, and there are sufficient water resources. It is also very necessary to pay attention to irrigation canals and agricultural roads so that farmers may more readily reach rice fields during planting and harvesting as well as more easily irrigate rice fields.

The Bokesan Village controls the fishing industry. Bokesan's population of men and women in 2020 is 168 and 169 respectively, with 110 family heads (KK). The greatest fisheries product is tilapia fish seed cultivation. Bokesan-based "Mino Ngremboko" Fish Farmer Group. The fishing industry provides the majority of the livelihoods in the village of Bokesan. Many factors contribute to this, but the constant flow of water and the existence of a year-round populace in the fishing business are particularly important. Bokesan's fish-breeding industry got its start in 1989, when the Bogor Fishery State School showed methods for catfish growing using this town as a Field Work Practice (FWP). The training's outcomes showed that it may give lucrative economic prospects, and it has progressed well up to this point. Then, the

already-existing fish farmers formed an organization known as "Mino Ngremboko." This farming group won the national competition for INPERAK, or Intensification of People's Breeding, in 2001.

### ***Combining Bokesan's CSR program with its empowerment initiative***

The fish farming intensification program is the main emphasis of the fish farmer empowerment program, which is part of the CSR program run by PT. MDK in Bokesan. To get the best outcomes, this approach places a strong emphasis on making the most of the land's current circumstances.

Multiple interviews revealed that the inhabitants of Bokesan have restricted space for fish agriculture while still safeguarding the land from environmental deterioration, suggesting that the fish farming model with an intensification pattern will be useful there. Therefore, technology must be employed to boost fish output; it's simply that the technology is simple for fish farmers to use and doesn't come at a significant cost. It is anticipated that this technique would result in shorter cultivation (harvest) times and a comparatively high level of production.

It can be claimed that PT. MDK's CSR initiative, which uses Micro Bubble Generator (MBG) technology to empower fish farmers in Bokesan, has been highly effective. Based on the findings of many sources' interviews, it is possible to explain how MBG technology may speed up fish development and increase the amount of dissolved oxygen in the water. The fish growing process will be quicker, more effective, and healthier thanks to MBG technology's ability to route oxygen into the pond to the fullest. Therefore, with improved water quality, fish may develop quickly within fish. The created fish weighs more. Due to the employment of MBG technology, the harvest season has been cut short. Before using MBG, harvests were typically double what they were afterward. Fish also grow 30%-50% in length and weight.

The majority of the fish maintained by the "Mina Ngremboko" Group in Bokesan are tilapias, which are grown using MBG technology. The introduction of MBG technology has allowed fish producers to earn more money and has helped to promote local economic activity. To boost fish output to satisfy demand, fish farmers in other regions might take inspiration from the success of MBG-based fish farming. Several sources have reported that the MBG technique for fish farming is perfect for small-scale freshwater fish farms since it requires little space and can efficiently use electricity to power a mill that spins feed into tiny pellets. Technology based on MBG has the potential to reduce feed, shorten the raising period, produce faster, healthier fish, and increase yields by dissolving oxygen in the water, eliminating mould, and speeding up the development of plankton that may be added to fish feed.

According to Ife (2008), (Mardikanto, 2013), and Wilson (2015), the PT CSR program was implemented with the notion of empowerment in mind. The MDK is explained subsequently:

- Integrated Development: Empowering fish farmers in particular is an example of sustainable planning since it has the potential to affect many different elements of life in Bokesan and Sindumartani Village.
- Human rights: In particular, empowerment programs help raise fish farmers' standards of living since they enhance income and fish harvests. (c) Sustainability: Specifically, the empowerment of fish farmers may be long-lasting and not just for short-term goals.



- Empowerment: In particular, fish farmers' empowerment is achieved through improving their knowledge and expertise in fish production, and fish farmers actively take part in this empowerment program.
- Self-reliance: Specifically, empowerment initiatives use an intensification strategy to maximize the usage of fish farmers' land utilizing MBG technology.
- Organic development: Specifically, fish farmers are empowered through various programs to pay attention to their circumstances and conditions, and the usage of MBG technology does not harm the environment;
- The integrity of process: particularly, enabling fish farmers to emphasize the phases of empowerment in addition to increasing harvest productivity.
- Co-operation: to enhance the organizational efficiency of fish farmers who are members of the Fish Farmer Group "Mino Ngremboko" situated in Bokesan, empowering fish farmers is also taken out. (i) Participation: Specifically, fish farmers must be empowered both individually and institutionally (via farmer organizations), taking into consideration their ownership of land and financial resources.

### ***Pattern of intensification in fish production***

“The Decree of the Minister of Maritime Affairs and Fisheries Number: Kep.09/Men/2002 concerning the Intensification of Fish Cultivation, hereinafter referred to as INBUDKAN, is one of the aquaculture development programs, with an emphasis on the joint movement of various parties to develop fish farming business, which is carried out based on cooperation”.

Bokesan's fish farmers have been given more agencies through an intensification strategy that makes the most of the available land by bolstering inputs of capital, expertise, and time. Cahyo no (2008) opines that the trend of agriculture development is:

First, making the most of the small amount of farmland that fish farmers in Bokesan Hamlet have available to them. On average, fish farmers in Bokesan have just a modest quantity of land for fish agriculture. As a consequence, an intensification pattern is used to boost fish output, meaning exploiting current land conditions by increasing technology, money, and resources to achieve optimal outcomes.

Second, increasing fish output with the use of technology (MBG). An intensification pattern is employed by the MBG technology used to boost fish productivity in Bokesan. "Intensification is an attempt to enhance productivity by repairing or replacing production equipment, both production elements, and working practices (Astuti, 2015). The use of MBG technology to increase fish output in ponds in Bokesan Hamlet is an example of applying innovation”. According to Rogers (2005), innovation is defined as a new concept, practice, or item by people or community groups. “According to Neeleman (2003), by definition, innovation is the process and/or result of developing and/or using information, skills, and experience to create or improve new items (products and services), methods, or constructions that bring immense benefits”.

Third, because the tools utilized may be produced from readily accessible materials or components, the capital required is generally low. Fish farmers in Bokesan who employ MBG technology for fish production require very inexpensive capital since the instruments used may

be built by themselves from readily accessible materials or components. Because the design is not complex and the cost is not prohibitively costly, the Microbubble frame will be constructed utilizing PVC Pipes and Pipe Fittings. The suction chamber air experiences vacuum pressure, causing the intake region to be employed as a water entry point to the center (Afisna et al, 2017).

Fourth, because MBG technology may enhance fish productivity by 30-50%, the amount produced is relatively significant. Several factors may be improved upon to enhance fish development. "In order to keep fish alive, keepers need to consider a variety of factors, including water and feed management, mud and subgrade control, population forecasting, and so on (Asma and Hasri, 2016). Water management is one of the aspects that affects fish growth in a pond or pond". Since an MBG may generate air bubbles, it can aid in the maintenance of pond water by increasing the oxygen content, which is beneficial to fish growth.

Fifth, because the harvest is now done three times instead of twice, the time required for cultivation is reduced. Furthermore, fish growth is faster and healthier, and fish weight increases. Because harvesting was formerly done two to three times a year, fish farmers in Bokesan now require a substantially shorter cultivating period after implementing MBG technology. Growth in fishes is understood to be an increase in both their length and mass over time. Cahyono (2000) states that several factors affect development, including the size and quantity of available feed, water temperature, and the concentration of dissolved oxygen. The variety and caliber of the food provided, as well as the volume and environmental circumstances that support it, have a considerable impact on the pace of the growth rate of fish.

Sixth, by eliminating fungus and increasing plankton development, MBG technology can enhance fish feed without decreasing the carrying capacity of cultivated land. There are several benefits for fish farmers in Bokesan to use MBG technology, including the fact that it does not reduce the maximum capacity of the farmed area, can effectively eliminate fungus, and accelerate plankton growth, all of which improve fish feed.

#### ***MBG technology adoption procedure***

PT. MDK's CSR and fish farmer empowerment programs in the Bokesan area are designed to help spread the word about MBG and other innovations in fish farming. In light of what Rogers (2003) suggests, we may judge the success of this empowerment and CSR program based on the following criteria: There are a lot of indicators that point to the likelihood of fish farmers adopting the MBG technology, which would increase fish output. These considerations can be broken down as follows: (1) Benefits, in that the MBG technology is readily available to fish producers and can lead to an increase in fish output; (2) Compatibility, in that the MBG innovation is suitable for the needs of fish farmers and can address the concerns that are faced by fish farmers; (3) Complexity, in that the new technology developed by MBG is straightforward and easy for fish farmers to understand and put to use; (4) Triability, that indicates fish farmers can readily test MBG technology to increase fish output; (5) Observability, that means farmers can witness the technology in action.

Figure 2 shows pictures of MBG equipment, while Figure 3 shows how MBG is used.



**Figure 2:** Micro Bubble Generator (MBG)



**Figure 3:** Using MBG in Fish Ponds

### ***Fish farmers' empowerment stages***

According to Ife and Tesoriero (2008), through intervention in the form of planning and policy-making, social and political action, and training, community empowerment seeks to strengthen marginalized groups' control over their own lives and the decisions they make on a personal, as well as societal, level.

Empowerment is divided into three stages: (A) the awareness stage, which involves informing the targeted that they possess the right to cope with the difficulties they confront. They should be inspired to believe that they can escape poverty; (B) Capacity development. This stage includes three types of capacity: (i) human capacity, which is conducted out by educating people, coaching, as well as other activities to enhance individual or group skills; (ii) organizational capacity, which is carried out by revamping the organization to start creating new technologies in the changes made; and (iii) system of values capacity, which is carried out by creating regulations that need to be obeyed by all of its members. (C) The stage of empowerment. This stage offers the community the authority and trust to handle the assets they have and to put the skills and abilities they have been given to use (Gangone and Ganescu, 2014; Hermawan & Yoyon, 2016 ). In the CSR initiative of PT. MDK, empowerment of fish farmers in Bokesan Hamlet is accomplished by giving attention to the method or phases of empowerment. According to Gangone and Ganescu (2014; Agus (2019), empowerment



comprises three stages: The first is knowledge, which helps fish farmers become aware of the problems they confront and the solutions available to them. This realization may then serve as a source of motivation. ability to raise fish yields. The first level of empowerment is raising public consciousness and educating the populace to provide people with the tools they need to lift themselves out of poverty. The target of the empowerment now receives "enlightenment," or the realization that they are entitled to some type of support. If the target audience is currently poor, for instance, they can be encouraged to see themselves as having the potential to become affluent via hard work and determination. Programs that may be delivered at this level include publishing cognitive, belief, and therapeutic knowledge. The fundamental idea is to convince the target that they need to be empowered and that the process of empowering must begin with them (Wrihatnolo & Dwidjowijoto, 2007).

Second, The capacity phase entails three types of capacity building: (a) individual and group training and instruction for the "Mino Ngremboko" farmer collective; (b) organizational empowerment ("Mino Ngremboko farmer group") through attempts to implement organization-wide changes that are responsive to specific requirements; and (c) the development of rules and regulations to which all members of the "Mino Ngremboko" farmer collective must adhere. Capacity building, or enabling, is the next step after capacity building. To begin, one must be willing to conform to constraints before being trusted with authority or responsibility. Communities that have expressed a desire for independence should be provided with an empowerment program or capacity development before being granted regional autonomy. This would ensure that these communities are "capable" of handling the increased responsibilities that come with their newly acquired autonomy (Wrihatnolo & Dwidjowijoto, 2007). The process of enhancing a group's potential Public, Given the wide range of cultural, geographical, social, political, and demographic factors at play here, it's crucial to recognize that successful capacity-building strategies in one group won't necessarily transfer to another. Since it is not an approach that works for other cultures, it poses a bigger threat of failure and diluting the experience of those people (Ife and Tesoriero, 2008). Community-level initiatives to strengthen and formalize existing institutions so that they can accept any idea, plan, or goal for the community's development are referred to as "institutional capacity building". As a direct result of the efforts put forth in this endeavor, community-based organisations that promote growth in their environments have been established. Building someone's capacity can also entail taking steps to improve their management and community organizing skills, with the end goal being to create institutional structures that are participatory and open to scrutiny.

Third, the empowerment stage, in which the "Mino Ngremboko" farmer group is given power and trust to manage the resources they have and utilize the abilities and skills they have been given. In a restricted sense, the providing of authority or empowerment. The goal has now been given control or an opportunity. To empower the community is to strive to improve the quality of life for its members, many of whom are stuck in cycles of poverty and underdevelopment. Independence and self-sufficiency are potent qualities (Wrihatnolo & Dwidjowijoto, 2007). One alternative definition of empowerment emphasizes strength while the other emphasizes marginalized communities. This authority is defined not just in terms of governmental authority but also in terms of authority or client influence (Suharto and Yuliana, 2015).

## **Conclusion**

To investigate the relationship between the fish farmer empowerment program and  
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the PT. The following is a rundown of what the study found: First, the way of empowerment utilised in PT. MDK's Corporate Social Responsibility (CSR) programme is the enhancement of aquaculture through the application of microbubble generator (MBG) inventions to boost fish productivity; Second, the stage of empowering is carried out in three stages: awareness about the significance of fish farming technology; capacity level, which provides fish farmers with the knowledge and skills in using MBG technology in order to improve fish production and enhance the empowerment of the "Mino Ngremboko" farmer group; and finally, the stage of empowering is carried out through the use of fish farming technology and stage of empowerment, which allows fish farmers to make connections between the skills and knowledge they have been given and the success they have had in increasing fish farming.

## Reference

- Adi, I.R. & Komunitas, I. 2013. Pengembangan Masyarakat Sebagai Upaya Pemberdayaan Masyarakat. Jakarta:Rajawali Pers.
- Afisna, L.P., Juwana, W.E., Indarto, Deendarlianto& Nugroho, F.M. 2017. Performance of Porous-Venturi Microbubble Generator for Aeration Process.JEMMME (Journal of Energy, Mechanical, Material, and Manufacturing Engineering), 2 (2): 73 - 80.
- Afrianto E, & Liviawati.2018. Beberapa Metode Budidaya Ikan.Yogyakarta: Kanisius
- Agus, H.P. 2019. Upaya Pemberdayaan Ekonomi. Jurnal Pemberdayaan FISIP UI, 1(1): 1-7.
- Asma. N, Z. A, & Hasri. I. 2016. Pertumbuhan dan Kelangsungan Hidup Benih Ikan Peres Pada Ransum Harian Yang Berbeda.Jurnal Ilmiah Mahasiswa Kelautan Perikanan Unsyiah, 1 (1): 1-7.
- Astuti, Tri, 2015. Buku Pedoman Umum Pelajar Ekonomi. Jakarta: Vicosta Publishing.
- Cahyono. B.2000. Budi Daya Ikan Air Tawar (Ikan Gurami, Ikan Nila, Ikan Mas). Yogyakarta: Kanisius.
- Gangone & Ganescu. 2014. Performance determinants for responsible supplyJournal Amfiteatru Economic Journal, ISSN: 2014: 2247-9104.
- Hermawan, Y. & Yoyon, S.2016. Pendidikan dan Pemberdayaan Masyarakat. Jurnal Pendidikan dan Pemberdayaan Masyarakat, 3 (1): 97–108.
- Ife, J.& Tesoriero, F. 2008.Community Development: Alternatif Pengembangan Masyarakat di Era Globalisasi.Yogyakarta: Penerbit Pustaka Pelajar.
- Lindawati, A. & Puspita, M.2015. Corporate Social Responsibility: Implikasi Stakeholder Dan Legitimacy Gap Dalam Peningkatan Kinerja Perusahaan. Jurnal Akuntansi Multiparadigma, 6(1):163–174.
- Mardikanto, T.2013. Pemberdayaan Masyarakat oleh Perusahaan, Corporate Social Responsibility, Acuan Praktisi, Akademisi, Dan Pemerhati Program CSR. Surakarta: Sebelas Maret University Press.
- Nasdian, T.2014. Pengembangan Masyarakat. Jakarta: Pustaka Obor Indonesia.
- Neelman. D. 2003. Effective Innovation, How to Stay Ahead of the Competition. London: Pen Books.
- Pranoto, A.R. & Yusuf, D. 2016. Program CSR Berbasis Pemberdayaan Masyarakat Menuju Kemandirian Ekonomi Pasca Tambang di Desa Sarijaya. Jurnal Ilmu Sosial dan Ilmu Politik, 18(1): 33-39.
- Pranyoto V.S.2015. Pembudidayaan Ikan Bokesan Dikembangkan Dengan Konsep Wisata. <https://jogja.antaranews.com/berita/331847/pembudidayaan-ikan-bokesan-dikembangkan-dengan-konsep-wisata>. Akses 02 Februari 2022:16.46.

- Rogers, E.M.2003. Diffusion of Innovations. London: The Free Press.
- Suharto, E. & Yuliana. 2015. Membangun Masyarakat dan Memberdayakan Masyarakat. Jakarta: Refika Aditama.
- Wilson, I.2015. The New Rules of Corporate Conduct : Rewriting the Social Charter. Westport CT: Greenwood.
- Wood, D. 2010. Corporate Social Responsibility. In W. Visser and D. Matten. The A To Z Of Corporate Social Responsibility, 1(1): 113-114.
- Wrihatnolo & Dwidjowijoto. 2007. Manajemen Pemberdayaan. Jakarta: Elex Media Komputindo.
- Effendi, I., Yanfika, H., Sumaryo, S., Listiana, I., Mutolib, A. and Rahmat, A., 2019. Has Empowerment Program Been Appropriate for the Need of Fisheries Business Player?: Case Study in Lampung Province, Indonesia. International Journal of Multicultural and Multireligious Understanding, 6(4), pp.332-341.
- Ahdan, S., Kaharuddin, A.H.B. and Yusriadi Yusriadi, U.F., 2019. Innovation And Empowerment Of Fishermen Communities In Maros Regency. International Journal of Scientific and Technology Research, 8(12).
- Swastawati, F., Roessali, W., Wijayanti, I. and Anggo, A.D., 2018. Evaluation of empowerment program to increase production capacity of fishery processing business in Semarang City, Indonesia. In IOP Conference Series: Earth and Environmental Science (Vol. 102, No. 1, p. 012082). IOP Publishing.
- Halim, A., Wiryawan, B., Loneragan, N.R., Hordyk, A., Sondita, M.F.A., White, A.T., Koeshendrajana, S., Ruchimat, T., Pomeroy, R.S. and Yuni, C., 2019. Developing a functional definition of small-scale fisheries in support of marine capture fisheries management in Indonesia. Marine Policy, 100, pp.238-248.
- Ginting, B., Nasution, M.A., Subhilhar, S. and Harahap, R.H., 2018. Analysis of weaknesses of coastal community economy empowerment program (PEMP) and national program of community empowerment of independent marine and fisheries (PNPM-MKP) on traditional fishermen in Indonesia.
- Hinrichsen, E., Walakira, J.K., Langi, S., Ibrahim, N.A., Tarus, V., Badmus, O. and Baumüller, H., 2022. Prospects for Aquaculture Development in Africa: A review of past performance to assess future potential.
- Ahmed, N. and Turchini, G.M., 2021. Recirculating aquaculture systems (RAS): Environmental solution and climate change adaptation. Journal of Cleaner production, 297, p.126604.