

THE DEVELOPMENT OF BIOFLOC FISH FARMING AS A EDUHEALTH TECHNOLOGY FOR PREVENTION OF STUNTING IN SIMPANG EMPAT VILLAGE, BANJAR DISTRICT

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ABSTRACT Stunting is a health problem that occur globally, and also Indonesia. This condition has long-term effects on individuals and societies, including diminished cognitive and physical development, reduced productive capacity and poor health, increased risk of degenerative diseases, and of course it will threaten the quality of the nation's future generations. Accordingly in those situations, so Indonesia and the region it self needs some effort as strategy for prevention and acceleration of stunting reduction. The offered innovation and method was to develop of biofloc fish farming as a eduhealth technology for prevention of stunting in Simpang Empat Village as a focus location in Banjar Regency for reduction acceleration program. This technology is not only provide the impact in health sector, but it could be affected to economic sector in community in long term. because later the results of fish cultivation in the biofloc pond can be consumed by the community themselves because they have high nutritional content to prevent stunting, and can also be sold so as to generate profits for the community.

KEYWORDS: *Stunting; Biofloc Fish Farming; Catfish; Ecohealth; Simpang Empat Village.*

1. INTRODUCTION

Stunting is a problem which referring to national health problem in Indonesia, so various efforts and programs are still needed for both prevention and treatment management. Malnutrition or stunting leads to a decrease in the quality of human resources in the future because toddlers experiencing malnutrition face increased risks of infection, growth and developmental disorders, and even death (Elsa Cahyaningrum & Prammatama Mars, 2024). Stunting is one of the most

significant impediments to human development, globally affecting approximately 162 million children under the age of 5 years. This condition is irreversible outcome of inadequate nutrition and repeated bouts of infection during the first 1000 days of a child's life. Stunting has long-term effects on individuals and societies, including diminished cognitive and physical development, reduced productive capacity and poor health, and an increased risk of degenerative diseases such as diabetes (WHO, 2025).

Indonesia through the Indonesian Nutritional Status Survey in 2024 stated that the prevalence of stunting in Indonesia in 2024 was 19.8%. This figure is 0.3% lower than the stunting prevalence target set for 2024, which is 20.1%. The achievement of stunting prevalence of 19.8% is also a new challenge, considering that the target for reducing stunting in 2025 is 18.8%, so Indonesia needs harder efforts and closer collaboration to reduce this prevalence rate. According to the National Strategy for Prevention and Acceleration of Stunting Reduction (Stranas P3S) which has been prepared by the Secretary of the Vice President, efforts to handle stunting should prioritize prevention factors (Kementerian Sekretariat Negara RI, 2025).

South Kalimantan as a one of province in Indonesia is also have responsibility to reduce this stunting's problem. The prevalence of stunting in South Kalimantan in 2024 is 9.4%. There are 4 districts with stunting prevalence above the provincial achievement and if ranked from the highest, namely Banjar Regency (24.60%), Hulu Sungai Utara (18.60%), Balangan (14.58%) and Tapin (12.70%) (Dinas Kesehatan Kabupaten Balangan, 2025). These figures prove that the problem of stunting in this province really needs to be optimized so that the number of cases continues to decrease every year.

Based on the number of cases, Banjar Regency is the regency with the highest number of cases for stunting in South Kalimantan Province. According to the Decree of the Regent in 2024, one of the villages that is the focus location for the stunting reduction acceleration program is in Simpang Empat Village, Banjar Regency (Bupati Banjar, 2024). Therefore, community service activities related to stunting prevention efforts have been carried out in the village. The efforts we offer are by implementing the technology-based Ecohealth method with the development of fish biofloc ponds or biofloc fish farming.

Ecohealth, or ecosystem approaches in human health focus on participatory and transdisciplinary aspects to understand the interrelations between the various components of socioecological systems and how these interactions influence the health of human population (Lebel, 2003).

Through the support of the community with local wisdom in their area for the management of this biofloc pond, as well as dual benefits such as the economy in the form of increasing community

income through the sale of fish from pond cultivation, and also the fish can be consumed independently by the community as raw materials for side dishes with protein content, so that it can be used by the community as one of the efforts to prevent stunting because they are empowered to manage this technology, utilizing both for income and independent consumption. So that the economic and health functions will run well if this activity continues to be carried out continuously by the community.

Biofloc technology is an emerging, eco-friendly and cost-effective approach for sustainable fish farming. Earlier, the biofloc system was used as the means to treat wastewater and control fish production. But now, it can decrease the overall expense involved in fish farming activities. Moreover, it is a sustainable process that does not harm the environment in any manner. As global demand for seafood continues to rise, the adoption of biofloc technology is likely to increase as it presents a viable solution to enhance productivity while minimizing environmental impact (Jalo, 2024). This technology is the new alternative techniques that have been applied to aquaculture, replacing a conventional culture system such as an earthen pond or cage culture. It is able to produce more production due to a higher stocking density.

This biofloc system is more efficient and convenient for commercial farming, and more cost effective (Sudaporn Tongsir et al., 2020). And the kind of fish that cultivated is catfish. Catfish are a local food ingredient from Kalimantan. Utilizing local food sources can serve as an alternative to address limited access to food for families and help mitigate food insecurity and malnutrition. These ingredients are commonly consumed by the local population, readily available, and relatively affordable (Mahalia et al., 2025; Sutyawan, 2022). Catfish also contains 17% protein, 6.6% fat, 0.23 – 1.3% carbohydrates, 0.9% ash, and 74.4% water. Compared to the fat content of other freshwater fish such as snakehead fish (4.0%) and carp (2.9%), catfish has a higher fat content (Nurfajrina & Hastuti, 2021).

Based on these various benefits either from the technology and the cultivated fish, also with the principle of community empowerment to prevent stunting, community service activities in the development of biofloc fish farming as a eduhealth technology for prevention of stunting in Simpang Empat Village, Banjar District are carried out.

2. METHOD

This community service program was conducted in Simpang Empat Village, Banjar District, South Kalimantan Province. The target location was a one of the villages that is the focus location for the stunting reduction acceleration program. The object of this community service was the head

of neighborhood association in Simpang Empat village, and the other staff of district office, which is around 12 persons.

Before the program was implemented, an initial assessment identified several key challenges at the partner facility during the focus group discussion process. After the discussion was finished, the activity was continued to sharing knowledge about the technology of biofloc fish farming. The information was given by the NGO who has conducted this method before in the other villages, so they want to share the best practices and lesson learned from their activity before which is led into the technology. The last part was arranging the follow up plan to develop the technology in this village.

To address these issues, the program applied a participatory and capacity-building approach. The method consisted of three main stages:

2.1. Needs Assessment

This process was conducted during focus group discussion with local partner. The discussion topic is divided into the condition of stunting problems that occur in their villages, the local program as prevention for stunting, their knowledge about biofloc, and their resources and readiness to conducting the biofloc.

2.2. Socialization about Biofloc Fish Farming

The NGO delivered every information that important to local partner, such as the definition of biofloc, the benefit and weakness either in economic or health things, tools and materials needed, working mechanism, and about the advantages to preserve the fish with this method than conventional.

2.3. Follow up Plan

Participants collaboratively drafted and refined the follow up plan, such as the people who are willing to provide land voluntarily and who are willing to voluntarily provide land and take responsibility for developing this method, as well as being an example for community in their village.

3. RESULT AND DISCUSSION

These result and discussion is a highlighted things from focus group discussion between the team and local partner.

1. The Condition of Stunting Problems

The problem of stunting still occurs in some children in the village. And information about stunting, especially about its prevention, has also been actively disseminated to the community, but the recipients of the information are more mothers, not fathers. This is because the majority of FGD participants are fathers, so they stated that they also need to receive information about stunting, but counseling activities about stunting for fathers have never been carried out.

2. The Local Program as Prevention for Stunting

The stunting reduction program that has been implemented in this village includes providing additional food to infants and toddlers who are indicated as stunting, then an independent program from the local sub-district head, namely the "Foster Father" program, which provides funds to buy additional food for six months to families whose children experience stunting.

3. Knowledge About Biofloc

The FGD participants stated that they had previously received counseling on biofloc, but only up to the stage of providing information, not up to the stage of practice and implementation. So they know that there is a more effective and efficient fish farming method compared to conventional farming methods.

4. The Resources to Developing Biofloc Fish Farming

They stated that the implementation of catfish biofloc can certainly provide various benefits to the community, one of which is as a form of hobby channel for people who like to keep fish, has economic value because in addition to being consumed by themselves, the results of catfish can later be sold and generate profits so as to improve the economic conditions of the community. And from the results of the FGD it was found that there were two village heads who were willing to provide land and become a pilot for the implementation of catfish biofloc technology development in Simpang Empat Village.

4. CONCLUSION

Basically, the principle of implementing community activities that have been carried out is the analysis of needs in the community, which in this case is related to preventing stunting. The community stated that this stunting problem should indeed be addressed, not only when it has occurred, but much more importantly before stunting occurs so that it does not become a heavy burden later to resolve stunting cases if it has occurred. When this needs analysis is known, it is necessary to know about the modalities owned by the community regarding the innovation methods

that will be applied, both in terms of knowledge, and other sources of local wisdom that can be used to facilitate the implementation of this effort or program in the future.

After the activity of exploring the modalities and willingness of the community, it will be continued to install a catfish biofloc pond in the community as agreed and the results will be seen in the future. Although innovation efforts like this cannot be seen quickly and instantly, community empowerment activities like this can certainly be an investment in both the economy and health (EcoHealth) which of course will be very beneficial in the community if implemented properly and sustainably.

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CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest regarding the publication of this article. No financial, professional, or personal relationships exist that could have influenced the work reported in this paper.

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