

## Merdeka "74" (Minapadi Together with Local Fish 7 Species And 4 Legowo)

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**Abstract:** The aim of this stimulus community partnership program is to solve the problem of rice farmers by applying the research results of the proposer team's research for community empowerment, namely "MERDEKA 74" (Minapadi together with local fish 7 species and 4 legowo) which is a system of planting rice with fish cultivation. in one rice field at the same time. This technology aims to increase farmers' income with high rice productivity and increase local fish production. This activity is mono-year located in Lango village, Pante Ceureumen District, West Aceh. The results observed included rice production and local fish production in the Minapadi system. The output to be produced is in the form of national journals, services, methods, products, teaching materials and HKI.

**Keywords:** local fish, legowo, minapadi

### Introduction

Cultivatorfish in Aceh, especially in West Aceh District, have started to develop. The fish that are raised are foreign fish introduced from outside Aceh and even outside the country. This condition puts pressure on local native fish populations. Meanwhile, Aceh also has the potential for native fish that are no less both in terms of quantity and quality, for example, sliced fish (*Osteochilus vittatus*) and giant prawns (*Macrobrachium rosenbergii*) (DKP Aceh, 2015). According to the research team's research results, local fish whose production has been successfully increased include shellfish (Mahendra and Supriadi, 2019), giant prawns (Mahendra, 2015), banana prawns (Mahendra and Gazali, 2017) and local snakehead fish (Saputra and Mahendra, 2018).

Potency and business opportunities for prospective businessmen are very potential, because the location of the activity is very strategic, namely having a source of irrigation water whose needs are always continuous and the average human resource workers in the area are farmers and fish cultivators, but their activities only work on one priority. without intensification for increase the income of farmers and fish cultivators.

Business groups (partners) will make business management, especially rice and fish production to improve the economy, however the problems faced by partners are have not received the knowledge and science that can increase production results. This Minapadi technology is rice planting system with fish farming in one rice field simultaneously. MERDEKA 74 "(Minapadi Together with Local Fish 7 Species and 4 Legowo) which is a system of planting rice by cultivating fish in one rice field simultaneously. This technology aims to increase farmers' income with high rice productivity and increase local fish production.

### Discussion

#### The Process of Local Fish Cultivation in the Minapadi Legowo System

The process of cultivating local fish in rice fields that will be used as fish cultivation with the Minapadi system should be done in rice fields with water discharge always available all the time or using irrigation. The location used is in accordance with the requirements for fish

cultivation in the Minapadi system, the location of the activity has an adequate irrigation area for irrigation use in the Minapadi system, in addition to irrigating rice fields as well as for fish and shrimp maintenance and also the latest water quality will lead to excellent fish growth. This is in accordance with the opinion of Sudiarta et al., (2016) which states that the Minapadi model is quite efficient and effective to be applied to irrigated rice fields where water availability is always there for the growth of rice and fish. The mini-paddy irrigation at the activity location can be seen in Figure 1, below.



Figure 1. Irrigation of activity locations

The requirement for a good location for Minapadi is then used as a pilot Minapadi rice field. The rice fields used with an area per plot were 5 x 10 m<sup>2</sup> as a pilot. Before starting the activity, first the soil is tilled using a hand tractor. This aims to evaporate poisonous gases and nutrients in the soil more fertile and to facilitate rice cultivation. This rice field tractor activity was carried out 3 times in wet / humid / watery conditions. Tilling the soil at the location of the activity using a hand tractor can be seen in Figure 2. The purpose of soil processing according to Nurhayati et al., (2015) states that soil processing in Minapadi has a dual function, namely to prepare for rice growth, as well as to grow microorganisms as fish food.



Figure 2. Soil processing with a hand tractor

In addition to cultivating the paddy fields using a hand tractor, we also do shoveling using a hoe (Figure 3). This is intended in addition to a fish-keeping container to avoid direct sun heat, also to treat pests in the form of snails and to facilitate fish harvesting. According to Hadi and Astuti, (2013) the purpose of slaughter is to protect fish from pests and the danger of drought caused by high evaporation. This ditch or slope is made transverse / horizontal and parallel to the bund with a width of 1 meter and a depth of 50-70 cm. The formation of slopes for raising fish with a width of 50 cm and a depth of 50 cm



Figure 3. Making kemalir with hoes

The rice fields are fenced off with nets so that they are not attacked by pests and diseases in local fish and rice. Installation of nets is carried out on the edge or around the rice fields (fence) and also on the rice to avoid pests such as birds. Installation of nets on rice is carried out when the rice is bearing fruit.



Figure 4. Fencing using a net on the edge and top of the rice field area

According to Hadi and Astuti, (2013) pests that attack rice and fish are birds, snakes or water raccoons / beavers and snails (Hidayat, 2018). Pests apart from destroying / eating / competitors are also carriers of disease / agents for fish life. So that fencing is carried out both on the side and above.

Furthermore, before the rice planting process is carried out, first a straight and clear planting line (legowo) is carried out by drawing a planting line tool that has been prepared previously (Figure 5) and assisted by a rope that stretches from end to end of the land.



Figure 5. Forming a planting line (legowo) using a cropping line scraper

The rice seeds used were superior varieties of the MAPAN P-05 type (Figure 6, left) which were sown for 18 days (Hidayat, 2018). Two rice seeds are used per planting hole at the intersection of the established lines. The process of planting rice uses the legowo 4: 1 rice planting system which is the best result (Bobihoe, 2013), namely for 4: 1 methods of planting rice which has 4 rows of plants then interspersed with 1 empty row per plot where the spacing is 25 cm. The process of planting legowo rice 4: 1 can be seen in Figure 7.



Figure 6. Commercial rice seeds (left) and sowing rice seeds (right)



Figure 7. The process of planting rice with the legowo system

The process of stocking local fish (Serukan fish, bileh fish, rasbora fish, kerling fish, local tilapia, local catfish and giant prawns) carried out each plot per type with a stocking density of 500 heads / plot after 30 days of rice planting. According to the West Sulawesi BPTP, (2016) the stocking of fish seeds was carried out 30 days after rice planting with the aim of avoiding drugs or fertilizers. Spreading fish seeds is carried out in the afternoon slowly so that the fish do not experience stress due to environmental changes.



Figure 8. The spread of giant fish and prawns

Feeding pellets of F-999 (seurukan fish) and gold coins (giant prawns) on an ad libitum basis with a frequency of 2 times a day.

Harvesting is done when 90% of the grain turns yellow or is done 10 days before the rice harvest by drying the rice fields first then the fish are caught slowly by shifting the fish and shrimp in total



Figure 9. Seurur fish pellet (FF-999) and Galag shrimp pellet (Gold Coin)

### Rice Production and Local Fish Maintenance

Rice production using the Minapadi system legowo can be seen in the table below:

Table 8. Rice production of the legowo system of Minapadi

Model	Rice Production (Sudiarta et al., 2016)	unit	Rice Production (processed data)	Unit
Without legowo	2.39a	ton / ha	13.15	Kg / ha a
Legowo 4: 1	2.94 b	ton / ha	16.17	Kg / ha b

*Note: Numbers followed by different letters mean significantly different at the 5% real level based on the LSD test*

According to Sudiarta et al., (2016) the average rice production (ton ha<sup>-1</sup>) based on the LSD test showed that the 4: 1 legowo treatment gave good results of (2.94 ton / ha) when compared to the treatment without legowo (2.39). ton / ha<sup>-1</sup>).

Meanwhile, the population density of 200 fish per plot gave good results for the growth of serukan fish, bileh fish, rasbora fish, kerling fish, local tilapia, local catfish and giant prawns.

### R / C analysis and B / C ratio

Analysis of the farming system of the Minapadi system for farmers needs to be done to find out how much added value can be obtained from the business, then economic analysis as part of knowing whether the system is feasible or not developed and to find out whether the Minapadi system is profitable or not. So below is described in a simple way the analysis of farming with the Minapadi system which is applied with one attempt per planting season.

According to Sudiarta et al., (2016) Analysis of the Minapadi system farming shows that the total costs incurred in one planting season are IDR 9,715,000 and the total income earned is IDR 20,277,500, so that the profit from the Minapadi system is IDR 10,562,500. Thus the Minapadi system is profitable to develop because the R / C value is 2.08, which means that the farm is efficient because the R / C ratio is more than one, likewise the B / C ratio is more than one, namely 1.08. The net profit after deducting the total cost was IDR 10,562,500. According to Akbar (2017) the benefits obtained by farmers before implementing the rice mina system are Rp. 46,589,495 / year after farmers implemented the Mina Padi system, farmers' profits increased by Rp. 75,401,269 / ha / year.

Benefits obtained by farmers from the Minapadi system (Akbar, 2017) :

- 1) Increase the income of lowland rice farmers who experience crop failure due to planthopper pests, because the presence of fish in the fields will consume planthoppers, which fall in water due to fish movements.
- 2) Helps accelerate environmental improvement because with Mina Padi will reduce the methane gas that is removed from the rest of the fertilization.
- 3) Save on fertilizer use.
- 4) Increase in fish consumption to improve family nutrition.
- 5) Obtained two kinds of production at once so as to increase the income of rice farmers. 6) Farmers become more diligent in monitoring their fields, because they have to check the water entering the rice fields and check the filters that are installed so that the fish do not come out.
- 7) Improve the structure of the soil, because the fish in foraging and turning the soil
- 8) Increase the potential of existing rice fields.
- 9) Can suppress the growth of weeds, reduce pest and disease attacks, and can increase natural enemies for plants, and
- 10) Fish manure is an organic fertilizer for planting rice.

### Conclusions

The potential for irrigated rice fields in Pante Ceureumen District technically meets the requirements for Minapadi development. Based on the results and discussion, it can be concluded that the 4: 1 legowo row planting system has a significant effect on the yield parameters of rice production (ton ha yaitu), namely (2.94 ton ha<sup>-1</sup>). While Local fish that can be cultivated using the Minapadi system are Serukan fish, bileh fish, Rasbora fish, kerling fish, local tilapia, local catfish and giant prawns.. The results of the analysis provide an advantage if the minapadi legowo system fish cultivation is carried out.

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