

Solar Cell Supported Fish Aggregating Device (FAD) in Sangihe Islands Regency Waters, North Sulawesi Indonesia

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¹ Solar Cell Supported Fish Aggregating Device (FAD) in Sangihe Islands Regency Waters, North Sulawesi Indonesia

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Background

Fish Aggregating Device is an accessory fishing device set in the ocean. It has been long utilized in Indonesia and known more than 30 years around Sulawesi waters, especially North Sulawesi, aiming to ease finding the fishing ground. If no FAD is available, fishermen should search for fish school on the surface by looking at birds darting the water surface and drifting objects on the surface.

The development of FAD is often related with the use of light as an accessory device to accelerate fish aggregations at night. Since obtaining fuels is recently difficult, fishing operation cost becomes high and less than the catch production. One of the efforts of managing the expenditure is to replace fuel utilization for light with the use of environmental friendly energy source, solar cell. This is one of the alternatives in solving the present fossil fuel energy crisis.

Positive benefit of this research success is expected to be able to implement it in light fishing fisheries development using the solar cell on the FAD as one of the efforts to overcome the present fossil fuel crisis that always recently inhibits fishing fisheries business activities.

Method

Data collected at the first stage included the solar cell-using FAD construction, the location of FAD position set using a GPS and an echo sounder, and studies on light distribution around the FAD using surface light and underwater light.

Results and Discussion

This study found that FAD construction used by the fishermen consisted of bamboos with control house on the FAD, and then the FAD was designed better to be able to use solar cell facility as energy source.



Fig. 1. FAD traditional design



Fig. 2. Modification design

Light distribution over the surface reached the depth of 8 m for 0.1 lux illumination. It means that the water volume covered was 267 ms. The illumination distribution of underwater light reached 25 m deep for 0.1 lux light intensity. This result indicates that underwater light has an intensity of 30 times larger than the light-over surface.

Fish gathering around the FAD caught by purse seine were scads.



Fig. 3. Catch on the boat



Fig. 4. Fish Marketing

CONCLUSION

The use of solar cell-FAD has given new opportunity for pelagic fishing fisheries development, both small and big pelagic fish. The use of underwater light will also be able to increase catches. This study needs further study on light intensity distribution using various different colors and economic feasibility of the solar cell-FAD in comparison with traditional FAD.

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