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Judul Jurnal Ilmiah (Artikel) : Environmental Assessment of Polyculture Farming Practice Based on Macrobenthic Assemblages: A Study Case at Coastal Area of Kaliwungu, Kendal, Centra Java, Indonesia

Nama/Jumlah Penulis : Sapto Purnomo Putro, **Widowati**, Ibni Jeudi Febria, Fuad Muhammad, Suhartana Suhartana, Suminto Suminto, Agung Sudaryono, Sunshuke Koshio/ 8 orang

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Semarang, 9 Oktober 2019  
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## Environmental assessment of polyculture farming practice based on macrobenthic assemblages: A study case at coastal area of Kaliwungu, Kendal (Central Java, Indonesia) (Article)

Putro, S.P.<sup>a</sup>, [Widowati<sup>b</sup>](#), Febri, I.J.<sup>a</sup>, Muhammad, F.<sup>a</sup>, Suhartana<sup>c</sup>, Suminto<sup>d</sup>, Sudaryono, A.<sup>d</sup>, Koshio, S.<sup>e</sup>

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### Abstract

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The purpose of this study was to determine environmental quality parameters using number of species, diversity and similarity of macrobenthic communities. This study was conducted at two locations, the Location I was a polyculture farming area, farming milkfish (*Chanos Chanos*) and black tiger shrimp (*Penaeus monodon*) and seaweed *Gracilaria* sp. in the coastal area of Mororejo, Kendal District, Central Java. Location II was the coastal area of PT. Plywood Indonesia, which is located adjacent to industrial activities as well as directly affected the tide. Systematic random sampling was employed, measuring physical-chemical parameters of water and sediment. Samples of macrobenthos were taken from the sediment. Data was analysed using diversity and evenness indices approach. Samples of macrobenthos were taken from the sediment using Eckman grab, then was analysed using diversity and evenness indices approach. Results showed that the Location I was dominated by *Cerithidea cingulata* and *Terebralia sulcata* (Potamididae), *Minima batillaria* (Batillaridae). The Location II was dominated by *Cirratulus* sp., *Cirriformia* sp. and *Aphelochaeta* (Cirratulidae) and *Prionospio* sp. (Spionidae), which are considered as indicators of disturbed area. This results implied that the use of area for both polyculture and industrial activities may lead to environmental disturbance, thus environmental coastal management need to be applied in regular basis, both temporally and spatially. © 2016 Penerbit UTM Press. All rights reserved.

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Environmental disturbance Macrobenthos Moderately disturbed area Polychaete Polyculture

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# THE INNOVATION OF VULNERABLE FISHERIES USING ECOSYSTEM-BASED FISHERY MANAGEMENT APPROACH: A TEST CASE IN KARIMUNJAWA ECOSYSTEM, CENTRAL JAVA, INDONESIA

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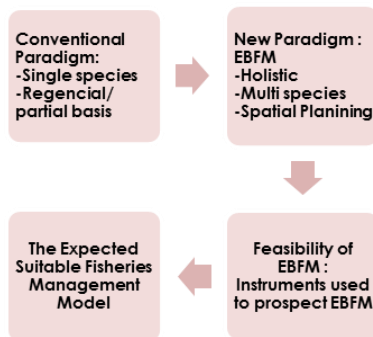
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## Graphical abstract



## Abstract

The sustainability of marine ecosystem has become a major concern the government; however, the implementation of sustainability-based fisheries management has not been fully carried out and well controlled. Therefore, having a concept of ecosystem-based fisheries management (EBFM) is essential in protecting it preserved. The aim of this study was to analyze the implementation of EBFM in Karimunjawa ecosystem, Central Java, Indonesia. The analysis of this study was based on the primary data collected from fishermen and stakeholders using in-depth interviews, and the secondary data gathered from stakeholders of Karimunjawa documentation. Meta-analysis with triangulation was invoked in this study. The result showed that the vulnerability of marine ecosystem, particularly fisheries' resource in the pilot project is in progress. The conventional approach has not yet succeeded in managing fisheries' resource in terms of sustainability attributes. Moreover, the EBFM has not yet proven to be a suitable approach for some reasons; although, this concept is very promising in encouraging a new paradigm for sustainable management in Indonesia with a protocol concept. This initial finding needs to be furthered in order to explore other aspects of development.

Keywords: Central Java, ecosystem, fisheries, management

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## 1.0 INTRODUCTION

As open-access resources, marine ecosystem has been utilized to its limit to be recovered. Both traditional fishermen and modern fishery companies exploit it that lead in the destruction of the resource. Realizing of its negative impact, many countries have been implementing fishery management scheme as it is assumed that natural resources or ecosystem is under controlled by human [1–3]. The behavior of ecosystem is becoming vulnerable and hardly can be predicted [4]. Therefore, in 2009, the Ministry of Fishery

and Marine Affairs of Indonesia issued a regulation regarding the minimum size of fish captured. However, as a result of an ineffective policy and enforcements, Indonesian fisheries have faced depletion [5]. Learning from both national and international experiences, an alternative approach to reform conventional fishery management needs to be introduced [6].

Indonesia, as a maritime country with approximately 17 504 islands, has implemented decentralization policy that brings positive and negative implication. The decentralization system of Indonesia provides local government an authority to issue a policy within its

# THE PHYSICOCHEMICAL CHARACTERISTICS AND ANGIOTENSIN CONVERTING ENZYME (ACE) INHIBITORY ACTIVITY OF SKIPJACK TUNA (*Katsuwonus pelamis*) "BAKASANG"

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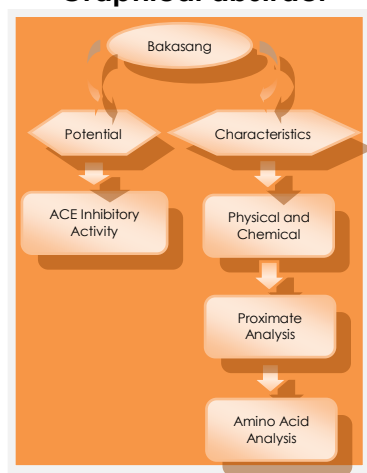
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## Graphical abstract



## Abstract

Bakasang is a traditional fermented fish product which is often used as condiments. This study aimed to determine the physical and chemical characteristics and potential ACE (Angiotensin Converting Enzyme) inhibitor of bakasang. Color and viscosity were physical characteristics measured in which color was presented in value of L\* (36.05), a\* (18.76), b\* (15.65), while viscosity value was 6 950 cP. The result of chemical characteristics including salinity, acidity, pH, TVB-N and LAB were 72 %, 2.56 %, 4.66, 36.88 mg N per 100 g and 3.32 log CFU g<sup>-1</sup> respectively. Proximate and amino acid compositions analysis were also identified, resulting in 14.77 % protein, 1.11 % fat, 57.15 % moisture, 25.97 % ash and 1.00 % carbohydrate while the predominant amino acid found was histidine. The ACE inhibitory activity of the isolated bioactive peptides of bakasang was 68.80 %.

**Keywords:** Angiotensin Converting Enzyme (ACE) Inhibitor, bakasang, bioactive peptides, skipjack tuna [*Katsuwonus pelamis* (Linnaeus, 1758)]

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## 1.0 INTRODUCTION

Bakasang is a traditional fermented fish product of Banda island, Maluku Province, Indonesia. It is made from Skipjack tuna meat with the addition of 20 % salt, followed by fermentation process under the sun for 7 d to 14 d and can then be stored for a few months.

Bakasang is a daily consumed food of Banda society as it is an inherited food which is still consumed up to now. It is usually used as condiment for cooking and flavoring agent for a number of food. Some studies have shown that fish sauce, similar to bakasang, contains nutrients that are beneficial for health. It contains about 20 g L<sup>-1</sup> of

nitrogen and 80 % of which are in the form of amino acids [1].

Hydrolysis of fish protein produces free amino acids, peptides and ammonia. High salt concentrations can control the growth of pathogens and produce preferred flavor and aroma. Some studies have shown that lactic acid bacteria are able to degrade protein into peptides that can inhibit Angiotensin Converting Enzyme (ACE) activity, the hypertension triggering enzyme. Inhibition of ACE activity would prevent hypertension. The research of ACE inhibitors in fermentation products has been widely carried out on milk and fishery products [2–8]. Some studies have shown that lactic fermentation on fish products provides ACE inhibitory activity [9–13].