Potentials of Coastal Ecosystemas Habitat of Malaria Mosquito Larva and Alternative Control in Simandulang Village, Labuhan Batu Utara 2019

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Keywords: Coastal Ecosystem, Larva Habitat, Mosquitoes, Control.

Abstract: The breeding of mosquitoes Anopheles which are very potential in the area of coastal ecosystem are lagoons, wetlands - marshes and paddy fields . Lagoons, swamps and rice fields are located side by side along the coast. Lagoons play only in the dry season, while swamps and rice fields contribute most of the year.The research location was in Simandulang Village, Tanjung Leidong Village, Kualuh Leidong District, Labuhan Batu Utara Regency.The purpose of this studywasto analyze the potency of coastal ecosystem as Malaria Mosquito Larvae Habitat andalternative control in the District Kualuh Leidong North Labuhan Batu regency . Analyzing the potential breeding places, such as lagoon, marshes and rice fields . Breeding anopheles mosquito larvae into adult mosquitoes. Identifying the types / species of mosquitoes in the study area in Simandulang Village, Tanjung Leidong Village, Kualuh Leidong District, Labuhan Batu Utara Regency. To Socializing *Anopheles* mosquito control in an environmentally friendly manner. Analyzing the quality of water physical parameters from mosquito breeding, namely lakes, swamps and rice fields. Conducting FGD, interviewing and distributing questionnaires to the fishing and farming communities in Simendulang Village, Tanjung Leidong Village, Kualuh Leidong District, Labuhan Batu Utara Regency. Distribution of questionnaires to the community was conducted to see the effect of population characteristics (age, sex, education, employment income) on malaria transmission. Through the control of mosquito vectors, it is expected that a decrease in the incidence and cases of malaria in the study area.

1 INTRODUCTION

Malaria is a serious and fatal disease that is transmitted by mosquitoes and if treated immediately the sufferer will experience severe complications and can cause death (CDC, 2016). According to the *World Health Organization* ((WHO), 2014), malaria mortality rates in the world in 2013 still reached 47% and 78% of them are children under the age of 5 years. *The Global Malaria Program* (GMP) states that malaria is a disease that must be continually monitored and evaluated, and needed to establish proper policy and strategy. GMP was targeting 80% of the population protected and patients receiving *Arthemisinin based Combination Therapy* (ACT) treatment (Harijanto et. al., 2010).

The process of transmission of malaria in an area includes three main factors, including patients with or without clinical symptoms, mosquitoes or vectors, and healthy humans. Physical, chemicaland biological environmental and socio-cultural factors of the local community greatly influence the spread of malaria. The interaction of weather and climate change, pond excavation, deforestation and areas with lots of standing water, bushes, and an unhealthy environment will affect the growth and development of malaria agents.

Global efforts in eradicating malaria have saved 3.3 million lives since 2000, decreased global mortality rates from mosquito-borne diseases by 45 percent and half of children under five years old. The WHO stated in the 2013 World Malaria Report that the expanded efforts of prevention and control helped in reducing mortality and illness due to malaria. Of the 3.3 million saved persons were most of themcome from 10 countries with the highest levels of malaria burden and children under five years old whose the group most affected by the disease(WHO, 2013) .

Malaria is an endemic disease in more than 100 countries around the world but it can be prevented by the use of mosquito nets and indoor spraying to avoid

Marsaulina, I., Dharma, S. and Kalsum, .
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DOI: 10.5220/0010013401670170
In *Proceedings of the 3rd International Conference on Social and Political Development (ICOSOP 3 2019) - Social Engineering Governance for the People, Technology and Infrastructure in Revolution Industry 4.0*, pages 167-170
ISBN: 978-989-758-472-5

malaria-carrying mosquitoes. This parasitic disease caused by mosquitoes kills hundreds of thousands of people each year, especially infants in the poorest areas of subsahara Africa. An estimated 3.4 million people continue to be at risk of contracting malaria, especially in Southeast Asia and Africa where around 80 percent of malaria cases werie found (Steenhuysen, 2013).

Indonesia is still a malaria transmission country or at risk of malaria because in 2010 there were 229,819 positive cases of malaria and it increased to 256,592 cases in 2011 (Ministry of Health, 2012). An estimated 50 percent of Indonesia's population still lives in malaria endemic areas. According to WHO no less than 30 million cases of malaria occur annually in Indonesia, with 30,000 deaths. In year 2001, national health survey found malaria mortality rates around 8-11 per 100,000 people per year. The prevalence of malaria in Indonesia is still high, reaching 417,819 positive cases in 2012. By 2015, malaria elimination was expected to be carried out in Java, Bali, Riau and West Nusa Tenggara Province.

Whereas the *Annual Paracite Incidence (* API) in Indonesia in 2013 reached 1.38 per 1000 population, meaning that there were 138 residents infected with malaria out of 100,000 residents. This figure had still not reached the Ministry of Health's Strategy target of <1.25 per 1000 population in 2013 (Ministry of Health, 2014). In addition, more than 70% of infant deaths in Indonesia were caused by diarrhea, pneumonia, measles, malnutrition and malaria (MOH, 2008) .

2 MANUSCRIPT PREPARATION

The researchdesign was a *qouasi experimental* design, that is a control time series design (Camphell, 1996). In other words, this design did not have strict restrictions on randomization and at the same time as controlling threats to validity. In this case, the experimental group consisted of 3 mosquito habitats, namely lagoon, swampand rice field. Those larvae were taken with a dipping device and then the larvae were breeded from larvae, pupae to adult mosquitoes with two repetitions. Then it was carried out identification of mosquito species found in the village of Simandulang, Kelurahan Tanjung Leidong, Kualuh Leidong District Labuhan Batu Utara Regency.

3 RESULTS

Based on Table 1, all water inspection parameters are still below the TLV except NH_3 which can be caused by the results of organic waste decomposition. To support the life of mosquito larvae, the above parameters can still increase the density of Anopheles mosquitoes. Research locations in coastal areas often do not support mosquito life due to salinity or high salt levels.

Table 1: Inspection results of ricefields, swamp and lagon water.

No	Parameter	Unit	Results			Quality standards*
			Ricefields	Swamp	Lagoon	
1	pH	mg / L	6.7	6.9	7.3	6 - 9
2	TDS	mg / L	35.6	33.2	42.2	1000
3	TSS	mg / L	138.2	125.2	186.4	400
4	DO	mg / L	2.84	2.26	2.82	3
5	BOD	mg / L	.86	0.92	1.36	6
6	COD	mg / L	14.68	16.23	24.6	50
7	NO_3^3	mg / L	1.24	1.86	2.36	20
8	NH_3	mg / L	0.3	0.4	0.6	(-)
9	NH_2	mg / L	TT	TT	TT	0.06
10	PO_4^{-3}	mg / L	.16	.18	0.25	1

* PPRI No. 82 of 2001 concerning management of water quality and water pollution control

Table 2. Number of Malaria Cases in Labuhan Batu Utara Regency in 2018

No	Districts	Public Health Center (Puskesmas)	Village	Number of cases
1	Kualuh Leidong	Tanjung Leidong	Tanjung Leidong	101
			Iunang Farm	21
			Outer Island Bay	27
			Teluk Pulau Dalam	15
2	Kualuh Hilir	Mosque Village	Black water	2
			A coconut	7
			Simandulang	8
			Mosque Village	1
			Bay of Piai	36
			Sentang River	1
			Tanjung Mangedan	56
			TOTAL	275

4 DISCUSSIONS

The results of the FGD activities found that according to the Head of Labuhan Batu Utara Regency's Health Service, the malaria problem in Tanjung Leidong Kualoh Leidong District Simandulang Village was a geografis factor such as located on the shoreline and the lagoons as mosquito nests needed a large budget to develop permanent drainages so there is no stagnant water for mosquito breeding places, while the budget is relatively small. According to the Head of the Tanjung Leidong Community Health Center, in Tanjung Leidong malaria was endemic in the past and the number of vector breeding places may be due to environmental factors.

According to the Head of Kualuh Leidong, the character of the people were careless or apathetic about cleanliness, even waste disposal in unsanitary manner and causing mosquito breeding places in Tanjung Leidong and having potency to malaria more widespread. Furthermore, the Head of Puskesmas Kp Mesjid explained the Puskesmas Kampung Mesjid, Kualuh Hilir Subdistrict also included malaria endemic areas, there were 2 villages namely Tanjung Mangedar Village and Piai Bay and it had ever been a massive out break of malaria in 2000. The types of malaria were *Plasmodiumfalcifarum* and *Plasmodium vivax* . The community leader of Tanjung Leidong Village said his area was a slum area and the most difficult thing was to change the mindset of human resources to be having a clean and healthy life behavior (Bruce-Chwatt, 1985).

Based on observations and examinations conducted in Simandulang Village, Tanjung Leidong Village, two types of malaria mosquitoes were found, namely Anopheles dundaicus and *Anopheles kochi*.(Marsaulina, 2010).

5 CONCLUSIONS

The results obtained from this study are:

1. It was found that basic sanitation conditions (drinking water, clean water, garbage, waste water management, and latrines) did not meet health requirements.
2. Found a lot of mosquito breeding places, namely lagoons, marshes and rice paddies around resident's homes.
3. Found several species of malaria mosquitoes, namely *Anopheles sundaicus* and *Anopheles kochi , in the* village of Simandulang, Tanjung Leidong Village , *those* habitat were payau water and rice fields
4. Physical and chemical water quality inspection results were still below the TLV except NH_3 due to the results of inorganic waste decomposition. The life of mosquito larvae in the water still supports the proliferation of anopheles mosquitoes, and its density can increase, whereas in the coastal areas, it did not support mosquito life due to salinity or very high salt content.
5. The results of the FGD activities showed that in Simandulang Village, Tanjung Leidong Sub-District, there were still a number of problems causing the high incidence of malaria including geographic factors, a lot of mosquito habitats such as swamps, lagoons, and rice fields. The people were lack of clean and healthy life behavior (PHBS).

ACKNOWLEDGEMENTS

The research was funded by the Research Unit of the UniversitasSumatera Utara, for the assistance of research grants with contract number Number: 4167 / UN5.1.R / PPM / 2019, April 1st, 2019. A great thank to Prof. Dr. Erman Munir, M.Sc. as Chairman of the Research Unit of UniversitasSumatera Utara, and also to the Secretary, Dra. Ir. Chairani Hanum, MS. for their guidance on the work. In conducting this research, the author received a lot of help, especially from the Ministry of Research and Higher Education, Rector of the Universitas Sumatera Utara, Leaders and Staff of the USU Research Unit and Dean of Faculty of Public Health Universitas Sumatera Utara. Thanks to the HeadHealth Office of Labuhanbatu Utara and his staff, the Office of the Environment, the Office of Fisheries, the Office of PUPR, and the Office of Agriculture for their contributions. Thanks to the Head of Kualuh Kelurahan, Leidong Subdistrict, Kualuh Hilir Sub-District Head, Tanjung Leidong Puskesmas Head, Tanjung Leidong Village Chief/Secretary, Village Head/ Simandulang Secretary, community and religious leaders who have cooperated well for the implementation of the FGD and this research. Finally, to all those who have helped us, but it is not possible all of them can be mentioned one by one, who has helped a lot during this research phase. For that, I sincerely apologize and I express my deepest gratitude and highest appreciation. Thank you for all helps given, may God Almighty and Compassionate, be able to avenge all the good thoughts of all parties.

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