

**ASSESSMENT OF INTER-PROGRAM AND INTER-SECTOR  
ROLES TO SUPPORT THE ACHIEVEMENT  
OF MALARIA ELIMINATION IN RIAU ISLANDS PROVINCE, INDONESIA**

***Asessmen Peran Lintas Program dan Lintas Sektor dalam Mendukung Pencapaian  
Eliminasi Malaria di Provinsi Kepulauan Riau, Indonesia***

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**ABSTRAK**

Terdapat 396 (80%) dari 495 kabupaten/kota di Indonesia merupakan endemis malaria pada tahun 2007, yang melatarbelakangi diterbitkannya Peraturan Menteri Kesehatan No. 293 Tahun 2009 tentang Eliminasi Malaria. Dukungan antar sektor terkait dibutuhkan untuk menciptakan pembangunan lingkungan yang berwawasan sehat untuk mendukung program eliminasi malaria. Penelitian ini dilakukan untuk mengetahui peran lintas sektor di Provinsi Kepulauan Riau melalui studi observasi dengan desain potong lintang. Pengumpulan data dilakukan dengan cara diskusi kelompok terarah (FGD) melibatkan antar program dan institusi seperti Badan Perencanaan dan Pembangunan Daerah, Dinas Pekerjaan Umum, Dinas Lingkungan Hidup, Dinas Perikanan dan Kelautan, dan swasta. Data diolah dengan konten analisis. Hasil penelitian menunjukkan peran masing-masing institusi. Konstruksi drainase yang dilakukan Dinas Pekerjaan umum menciptakan dukungan lingkungan atas eliminasi malaria karena mengurangi genangan air. Dinas Lingkungan Hidup melakukan upaya dukungan dengan melakukan restorasi kondisi lingkungan untuk mengurangi lingkungan yang kondusif bagi perkembangan nyamuk *Anopheles*. Dinas Perikanan dan Kelautan berperan dalam menyediakan ikan untuk sebagai predator alami untuk menghentikan perkembangbiakan nyamuk *Anopheles*. Dalam konteks tata pemerintahan desentralistis, peran pemerintah daerah menjadi cukup penting dan perlu ditingkatkan untuk mendorong kerjasama antar sektor dan swasta melalui penilaian atas dampak lingkungan untuk pembangunan lingkungan sehat dengan cakupan lebih luas.

**Kata kunci:** Antar program dan sektor, kerjasama, eliminasi malaria, Kepulauan Riau

**ABSTRACT**

*There were 396 (80%) out of 495 malaria-endemic districts/cities in Indonesia in 2007 leading to the issuance of Health Ministerial Decree No. 293 in the year 2009 on malaria elimination. Therefore, the study was needed to determine the inter-sector roles to support malaria elimination in Riau Islands. The study was an observational study with a cross sectional design. Data were collected through focus group discussions involving institutions, such as the Regional Development Planning Agency, Office of Public Works, Office of Environmental Affairs, Office of Marine and Fisheries, and private sectors. Data were analyzed by content analysis. The results revealed that roles of key stakeholders were determined. For instance, drainage constructions by the Office of Public Works led water flow or eliminated pools for malaria vectors breeding. The Office of Environment Affairs restored such environmental conditions to avoid *Anopheles* mosquitoes breeding places. The Office of Marine and Fisheries reared certain fish as predators of the *Anopheles* to stop malaria transmission. Under decentralization, roles of the Local Government or District Secretary is required to synergize the inter-sector collaboration. Collaboration between local governments and private sectors should be enhanced through Environmental Impact Assessment for broad and healthy environmental development.*

**Keywords:** *Inter programs and sectors, collaboration, malaria elimination, Riau Islands Province*

## INTRODUCTION

Malaria remains the problem faced by Indonesia as a tropical country. Indonesia is one of three ASEAN countries with the highest malaria morbidity. In 2007, a total of 396 (80%) out of 495 districts/cities in Indonesia was malaria-endemic areas (Ministry of Health, 2009a). The case fatality rate (CFR) of malaria still fluctuated from 0.26% in 2000 to 0.49% in 2003 and down to 0.056% in 2007, despite low achievement of the national target of 0.04% (Ministry of Health, 2009b)

The Health Ministerial Decree No. 293 in 2009 on Malaria Elimination is to limit malaria in a particular geographic area against imported malaria and malaria vectors. Malaria elimination is implemented in stages: 1) Seribu Islands of Jakarta, Bali and Batam Islands in 2010; 2) Java Island, Nanggroe Aceh Darussalam (NAD) and Riau Islands Provinces in 2015; 3) Sumatra (except for Aceh and Riau Islands), West Nusa Tenggara Province, Kalimantan and Sulawesi Islands in 2020; and 4) East Nusa Tenggara, Maluku, North Maluku, Papua, West Papua Provinces in 2030.

According to WHO, preventive activities towards malaria elimination require technical, operational and budget feasibility. Technical feasibility relates to whether malaria elimination is achieved on the targeted year. Operational feasibility pertains to whether the policy, surveillance and resources are adequate; and budget feasibility refers to whether the region can provide the funds required for the activities to achieve malaria elimination (World Health Organization, 2014).

Law No. 33 of 2004 on Regional Government stipulates that regional autonomy is directed to accelerate the realization of public welfare through improvement of services, community development and regional competitiveness (The House of Representative of The Republic Indonesia, 2004). Development has impacts on environmental conditions, for example as the presence of places conducive to *Anopheles* mosquito breeding such as ponds, lagoons and puddles.

Moreover, a malaria elimination certificate issued by the Ministry of Health is awarded to only those districts/cities with an API of < 0.1 per 1,000 inhabitants and no malaria endogenous to their region. Islands Seribu District of the Special Region of Jakarta the Capital (DKI Jakarta) represents the first district to obtain the malaria elimination certificate from the Ministry of Health in 2013 (Ministry of Health, 2013).

The District Health Office have health related duties and authorities. The relevant sectors also have the main duties and functions in line with the healthy environmentally sound development . The Health Offices have a role to advocate the district/city Governments to be committed to improving health systems and preventing malaria in order to achieve elimination of malaria in Indonesia by the year 2030. The intervention through the Strategic Plan of Gebrak Malaria 2009 to 2015 showed a good progress (Letelay, 2016). WHO mentioned that promoting greater intersectoral collaboration in vector management can have many other long terms benefits (World Health Organization, 2017).

For inter sectoral collaboration in health sector on disease prevention in Indonesia has been undertaken, yet less sustainable A study aimed to determine the inter-sector roles in the prevention program to achieve malaria elimination in Riau Island Province as targeted by year 2015, Indonesia (Kuntz *et al.*, 2014). It was part of a study on analysis the implementation of The Health Ministerial Decree on malaria elimination in Indonesia.

## METHODS

An observational study was applied with a cross-sectional design which was carried out in 2011. Data were collected by focus group discussion (FGD). The informants were selected purposively representing the Riau Islands Province Government. The participants were nine informants. There were from institutions which manage program activities for malaria control in Provincial Health Office, namely: 1) The Head of Division of

Disease Prevention and Control, 2) The Head of Section of Disease Prevention Program and 3) The Head of Section of Health Promotion Program. Besides, informants for inter sectoral institutions related to the activities for malaria control were 1) The Head of Bappeda; 2) The Head of Public Works Office; 3) The Head of Environment Affairs Office, 4) The Head of Agriculture, Forestry, and Animal Husbandry Office; 5) The Head of Marine Affairs Office; and 6) a private company representative.

The FGD was in one group because there had been formed an intersectoral team for malaria elimination. The Guidelines were formed and discussed related to inter sectoral roles on the policy of malaria elimination, including 1) Understanding, 2) Implementation, 3) Budgeting, 4) Innovation, 5) Roles of Local Government in accordance to malaria program activities. The facilitator of the FGD was a pointed researcher who had sufficient knowledge on malaria prevention and control.

The discussion were recorded and transcripts were made by two other researchers. Then, the transcripts of data were analyzed by content analysis. The ethical clearance was issued by the Ethic Committee of the National Institute of Health Research and Development,

Ministry of Health of Indonesia (No. KE.03.04/EC/214/2011).

## RESULTS

The API in Riau islands Province tended to increase from 1.52 in 2008, 2.29 in 2009, 3.56 in 2010 and 5.72 in 2011 (Riau Island Health Office, 2011b). But it varied between 1 and 5 per 1,000 inhabitants (Riau Island Health Office, 2011a). The relatively low API was found in Batam Island with 0.05 per 1,000 inhabitants in 2011 (Riau Island Health Office, 2011b) and Bintan Island with 2.2 per 1,000 inhabitants in 2011 (Bintan District Health Office, 2011b).

According to The Law No. 25 of 2002, Riau Islands Province is the 32<sup>nd</sup> province (The House of Representative of The Republic Indonesia, 2002), in which the territory is an archipelago consisting of 2,408 large and small islands with 40% of those islands are unnamed and uninhabited. The total areas of Riau Islands Province are 252,601 km<sup>2</sup>, in which 95% are sea and 5% are land. Riau Islands Province consists of two cities (Tanjung Pinang and Batam), and 4 districts (Bintan, Karimun, Natuna and Lingga Districts), with Tanjung Pinang City as the capital (Riau Islands Province, 2015). Riau Islands Province is rich in mining products, such as sand, bauxite or granite.

Table 1. Population in Riau Islands Province, Indonesia, Year 2011

No	Variable	Total
1	Population	1,693,084
2	Population at risk of malaria	544,802
3	Number of health workers	5,682

Table 2. Government Health Facilities in Riau Islands Province, Indonesia, Year 2011

No	Government Health Facilities	Total
1	Hospital	-
2	Private hospitals	6
3	Inpatient Primary Health Centers or <i>Pusat Kesehatan Masyarakat Rawat Inap</i>	16
4	Outpatient Primary Health Centers or <i>Pusat Kesehatan Masyarakat Rawat Jalan</i>	25
5	Village Delivery Post or <i>Polindes (Pondok Bersalin Desa)</i>	42
6	Village Health Post or <i>Poskesdes (Pos Kesehatan Desa)</i>	229

The population of Riau Islands Province is 1,693,084 people, approximately one-third of which, or 544,802 people were at risk of malaria. The Provincial Health Office manages health care facilities consisting of 6 private hospitals and 41 Primary Health Centers, 61% of which were outpatient of Primary Health Centers, and 42 *Polindes* (Riau Island Health Office, 2011b). In addition, the ratio of the overall health workers to population is 3.35 per 1,000 population.

According to the Head of Section the Disease Prevention Program of Riau Islands Province Health Office, the Malaria Prevention Program to achieve malaria elimination commenced in 1992 with zoning of elimination in 'Barelang Binkar' or Batam, Rempong, and Galang and Bintan and Karimun Islands. Batam, Rempong, and Galang Islands belong to the administrative area of Batam City. This was similar to the statement of the Sub-Directorate General of Malaria Prevention Program of the Directorate General of Communicable Disease and Environmental Health that elimination of malaria commenced in Bali, DKI Jakarta, and 'Barelang Binkar'. The malaria elimination team in Riau Islands Province was formed in 2004. Meanwhile, the Instruction of Head of Bintan District on malaria

elimination in the district was issued in 2011 (Bintan District Health Office, 2011a).

As stated by the Head of Section the Malaria Prevention Program of Provincial Health Office, implementation of malaria elimination was spearheaded by Primary Health Centers with two variations in implementation, in which Batam City was inclined toward curative treatment and Bintan District toward preventive efforts. Implementation of malaria elimination was monitored by 1) review of the presentation made in the Riau Islands Province Health Office; and 2) technical assistance to find solutions with the City/District Health Offices conducted twice a year. However, the implementation of the policy often encountered obstacles with regard to the fairly high transfer of staff.

The innovation activity in the malaria prevention program by the Provincial Health Office was undertaken through collaboration with the Ministry of Health of Singapore in training for malaria staff and entomologists. The Health Promotion Section developed the '*Desa Siaga*' (Alert Village), in which one of the activities was to eliminate *Anopheles* larvae population. However, it was confronted by constraints of the lack of health promotion staff, despite the availability of a midwife in every village and support of the sub-community health centers (Table 3).

Table 3. Inter-Program Activities to support Malaria Program of Riau Islands Province Health Office, 2011

Provincial Health Office	Program Activities
Disease prevention program	Proper diagnosis and prompt treatment
Environmental prevention program	Vector control
Health promotion program	Counseling, ' <i>Desa Siaga</i> ' for mosquito larvae control

Table 4 showed malaria prevention program activities implemented by the Provincial Health Office in 2010 to achieve

malaria elimination. The target program activity was set relatively lower than in regional planning.

Tabel 4. Malaria prevention program activities implemented in 2010

No	Activities	Provincial Health Office			Regional Planning		
		Project	Target	%	Program	Target	%
1	Microscopically-examined fever cases:	13,427	19,425	69.12	13,427	16,150	83.14
2	RDT-examined fever cases at sub-community health centers	5,453	4,831	112.9	5,453	4,831	112.9
3	Blood-tested pregnant women for malaria diagnosis	4,051	11,168	36.24	4,051	7,150	56.66
4	ACT-treated positive malaria cases in Health Service Unit (UPK or <i>Unit Pelayanan Kesehatan</i> ) and Village Malaria Post or <i>Posmaldes (Pos Malaria Desa)</i>	4,422	3,337	132.51	4,424	3,650	121.15
5	Long-Lasting Impregnated Nets (LLINs) distributed during antenatal care	2,791	10,575	26.39	2,791	7,150	39.03

The 2010-2015 Mid-Term Regional Development Planning of Riau Islands Province for Health Sector prioritized the improvement of access to health cares, coverage of health programs, with a focus on facilities, infrastructure and health personnels. The *Bappeda* of Riau Islands Province set the budget for the Riau Islands Province Health Office of IDR 1,544,920,300,- or approximately 7.5 to 8% of the total provincial budget.

Furthermore, according to the Head of Section the Malaria Prevention Program of Riau Islands Province Health Office, inter sectoral involvement in the implementation of malaria elimination faced an obstacle with regard to the lack of problem mapping. It was required to determine the sectors involved. The roles and inter sectoral activities to support malaria elimination in Riau Islands Province by the Focus Group Discussion are presented at Table 5.

Table 5. Inter sectoral Activities to support Malaria Elimination in Riau Islands Province, Year 2011

No	Inter-Sector	Roles	Activities
1	<i>Bappeda</i>	Regional development planning	Improvement of access, coverage scope aspects, with a focus on facilities, infrastructure and relevant health personnel.
2	Office of Public Works	Development with good drainage system	Road construction should be provided good drainage, but it is often disregarded due to inadequate budget. In addition, housing neighborhoods did not consider the construction of drainage. The mining of sands, bauxites and granites created mining basins which became breeding grounds for mosquitoes.
3	Office of Environmental Affairs	Environmentally sound development	Regulations on the mining management at the level of new regional regulations were being drafted, but the instructions from the Central Government are already available. Activities that had been done were the closure of mining basins and reforestation efforts.
4	Office of Agriculture, Forestry, and Animal Husbandry	Healthy environmentally sound forest management. Community empowerment with	Replanting of mangrove forests with a target of 10 million mangrove in 2015.
5	Office of Marine Affairs	an implication as biological control against malaria vectors.	Aquaculture with the provision of seeds to improve the local economy.
6	Private Sector, a private company:	Corporate Social Responsibility (CSR) in health	Contribution in social and health areas by funding the treatment of workers with malaria and the construction of Emergency Room.

Development activities carried out by the Office of Public Works should be accompanied by the construction of good drainage/irrigation systems. The Office of Public Works also developed coastal areas into regions, despite the minimum extent, with environmental manipulation. In addition, there were replanting of mangrove forests in an area of 5 Ha and reforestation of post-mining land. With regard to Corporate Social Responsibility, such as bauxite mining companies, companies played roles in the treatment of malaria and the construction of Emergency Room.

## DISCUSSIONS

The ratio of health personnel in Riau Islands Province was 3.35 per 1,000 population or relatively above the threshold ratio of numbers of doctors, nurses and midwives of 2.3 per 1,000 population (Poz *et al.*, 2007). In comparison, the numbers of health personnel in hospitals and Primary Health Centers throughout Indonesia in 2004 was 274,383 people for healthcare services to approximately 218 million population (Coordinating Ministry for People Welfare, 2013). However, Riau

Riau Islands Province is faced with obstacles in which the region is almost entirely sea and the transfer of health staff is high. Thus, Riau Islands Province prioritizes the development of health sector by improving the access, coverage and scope aspects with a focus on health facilities, infrastructure and health personnel as set forth in the 2010-2015 Mid-Term Regional Development Planning. Additionally, it committed to a health budget of 7.5 to 8% of the first-half regional budget in 2010.

The Government of South Halmahera District of North Maluku Province stressed that the high incidence of malaria would influence productivity, leading to declined revenues (The Government of North Maluku Province, 2003). So that it is important to prevent such common disease like malaria since healthy people can work productively and earn more income, thereby boosting the economy.

Riau island province is rich of mining areas. The income per capita of this province in 2010 was Rp. 42,648,935.40 or the forth after DKI Jakarta, East Kalimantan, and Riau Provinces. Meanwhile the income per capita of Indonesia in 2010 was Rp. 22,837,644.82 (Central Beureau for Statistic of Riau Islands Province, 2010). In the global era, the environmentally sound development in Riau Islands Province has been running with reference to The Law No. 32 of 2009 on Environmental Control and Management (The House of Representative of The Republic Indonesia, 2009). The vast number of beach is conducive to the breeding of mosquitoes that live in brackish water. Diminished mangrove forests result in changes in water salinity, conducive to vector breeding. Activities of development and mining, such as sands, bauxites or granites, in Riau Islands Province resulted basins/inundations which, if not managed properly, are conducive to mosquito breeding. Therefore, Riau Islands Province has the vision 'one person one tree' that was committed to improving the environment in general and planting mangrove trees with a target of 10 million mangroves in 2015.

Construction of drainage by the Public Works Offices led water to flow or eliminated pools for breeding of malaria vectors. The Office of Environment Affairs restored such environmental conditions as those places conducive to the breeding of *Anopheles* mosquitoes. The Marine and Fisheries Offices reared fish as predators of the *Anopheles* mosquitoes, as to stop the transmission of malaria.

Inter sector roles in achieving malaria elimination in several districts were played by related Offices (Roosihermatie and Rukmini, 2012) such as the Office of Education, the Office of Demography, the Office of Community Development, the Office of Agriculture and Fisheries in Kulon Progo District in combatting malaria, despite the undetermined responsibilities (Lesmana, 2005). The inter sector roles in Batam City remained inappropriate (Manalu, Sp and Sukowati, 2014).

World Health Organization declared, inter-sector roles in managing malaria vector provide benefit for achieving malaria prevention goals (World Health Organization, 2017). In some African countries there were inter-sector collaboration for malaria vector control. In Ahafo Ano South District, Ghana, shows less collaboration lead to strategically loss in sharing resources, transfer knowledge, and in tune activity. On the other hands, if there is no collaboration among stakeholders, it would achieve minimum ability in managing the implementation of the preventive program (Hardy, Phillips and Lawrence, 2003; Owusu *et al.*, 2013). In Central Tanzania inter sector roles described by agriculture department tasks for controlling malaria vector (Mayala *et al.*, 2015; Mlozi *et al.*, 2015). Inter sector role success story also showed by Uganda in consolidating strategic planning and operational frameworks for VBD control by establishing an evidence-based IVM approach (Yeka *et al.*, 2012; Okia *et al.*, 2016). This will help the country to expedite their efforts towards achieving VBD elimination/eradication, particularly malaria. The country should put into operational implementation arrangements

as outlined in the IVM strategic guidelines. IRM should be implemented and hence vector surveillance improved. In addition, strengthened IEC/BCC and consolidating inter-sector collaboration and coordination will be crucial for scaling up and utilization of vector control interventions in the country (Okia *et al.*, 2016).

However, the involvement of non-health sector participation is a challenge as here the relevant office is still conducting activities that contribute in reducing the development of malaria vectors in accordance with their duties and functions. Also the existence of government in unifying Commitment, Coordination, Integration and Partnership with related parties is expected to increase sustainability of the activities (Beier *et al.*, 2008; Letelay, 2016)

The intersectoral activities to support malaria elimination in Riau Islands Province were carried out in accordance with main duties and functions with environmentally sound development. In support the policy implementation to achieve malaria elimination especially in Riau Islands Province that targetted in 2015, is necessary to increase cross-sectoral cooperation especially to control malaria vector. In accordance with decentralization, the role of local government (Roosiermatie *et al.*, 2015) or the regional secretary is required in order to synergize the intersectoral activities (Mlozi *et al.*, 2015)

Moreover, cooperation of the Government and private sectors should be enhanced through the Environmental Impact Assessment (EIA) for broad and healthy environmental development

## CONCLUSIONS AND SUGGESTIONS

### Conclusions

The inter sector activities to support malaria elimination in Riau Islands Province were carried out in accordance with main duties and functions with environmentally sound development. Construction of drainage by the Office of Public Works led water to flow or eliminated pools for malaria breeding

vectors. The Environment Affairs Offices restored such environmental conditions as those places conducive to the breeding of *Anopheles* mosquitoes. The Marine and Fisheries Office reared fish as predators of the *Anopheles* mosquitoes to stop the malaria transmission. The cooperation of the Government and private sectors should be enhanced through the Environmental Impact Assessment (EIA) for broad and healthy environmental development.

### Suggestions

The strong roles of Local Governments or the District Secretaries are needed to improve in Inter-sector cooperation, especially with regard to the explaining activities and reporting the outputs at the end of the year in order to synergize the activities.

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