

STRATEGIC MANAGEMENT: SUSTAINABLE GOVERNANCE OF DENGUE IN MALAYSIA

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ABSTRACT: *Dealing with the issue of dengue requires strategic thinking and effective management. This is due to dengue being a critical global problem. It also stems from human activities that have disrupted social, environmental and economic dimensions. Nowadays, there is no specific treatment to cure the disease. However, various efforts and dengue control measures have been taken especially in controlling the dengue vector to ensure environmental sustainability is guaranteed. Malaysia is one such Asian country that is committed to strategically fight dengue by reducing the number of dengue cases and deaths caused by dengue within three years. Besides, the recorded number of dengue cases can be further reduced in the pursuit of sustainable development goals. Thus, this study reviews the strategic management of sustainable governance towards dengue to make Malaysia an outstanding exemplary country in combating dengue. This study also aims to evaluate their trust in key players, attitudes toward nature versus material and technology to be linked with good governance management to sustain our community and cities without dengue.*

Keywords: Strategic Management, Sustainable Governance, Dengue Disease, Malaysia

1. INTRODUCTION

Dengue is a problem that has seriously adversely affected the world. Almost every continent has been exposed to dengue, especially tropical and sub-tropical countries including Malaysia [1,2]. Choy et al. stated that dengue is caused by social, environmental and economic factors [3]. These factors involve problems that arise from human activities and behavior [4] due to population growth, urbanization, globalization, global warming and climate change [1,5-10]. Nowadays, Malaysia is still facing with dengue. Although dengue cases have declined in number, they are still at a level of concern. From January to December 2016, 101,357 dengue cases were reported to cause 237 deaths due to dengue. In 2017, a total of 83,492 dengue cases were reported and about 177 deaths. Meanwhile, the dengue cases from January to 27 December 2018 reported 79,472 dengue cases and 135 deaths respectively. Currently, until 13 July 2019, the dengue cases recorded 68,950 cases and 100 deaths due to dengue [11]. Despite the reduction in dengue cases, the percentage of dengue cases in the past four years remains a major concern in Malaysia.

The decrease in dengue cases indicates the strategic management of dengue. Management of the disease cannot be conducted as a one-way approach. Communities across Malaysia must participate in combating dengue. Dengue incidences can be reduced when everyone is directly involved [12]. Environmental awareness and sustainability are linked [13] as clear knowledge encourages a good attitude. The environment can be managed by legal methods involving public law and the environment can also be managed in a non-legal manner. Law enforcement is essential to ensure sustainable development of well-being which then leads to enhanced environmental awareness [14]. While, environmental management using non-legal methods involves planning, research, monitoring, education, and public policy aspects that need to be improved. Therefore, the advancement of science and technology has also slightly improved dengue prevention and control in Malaysia. This study is important to propose a concept of sustainable

governance of dengue so that the environment is preserved well and conserved for the next generation. Therefore, we need to ensure good governance of dengue cases to manage the problem strategically. Furthermore, this study also analyzes the level of trust in key players, attitudes toward nature versus material and attitudes toward technology in the Klang Valley, Malaysia to demonstrate the sustainability of governance against dengue in Malaysia.

2. ENVIRONMENTAL SUSTAINABILITY ON GOOD GOVERNANCE

Environmental sustainability refers to environmental preservation and conservation [14] for the needs of future generations [15]. Governance involves decision making, including the decision to take or not to take action [16]. Combining these concepts, sustainable governance then refers to understanding environmental issues in the decision-making process on a complex scale to benefit everyone in many ways and disciplines. To achieve such goals, good governance of dengue should be practiced in Malaysia. The following eight factors are emphasized:

- A. **Participation** from various parties irrespective of race, religion or skin color is necessary to combat dengue. Participation in the decision-making process can be either directly from the government or indirectly through non-government organizations, industries or communities engaged in dengue management.
- B. **Rules and Laws** are necessary to protect human rights and civil liberties. Every Malaysian citizen is subjected to the enforcement of these rules and laws, including those protecting the environment. In particular, laws combating dengue are Environmental Quality Act 1974 (Act 127), Destruction of Disease-Bearing Insects Act 1975 (Act 154) and Prevention and Control of Infectious Diseases Act 1988 (Act 342). The empowerment of these laws is necessary to ensure full support towards a dengue-free environment for sustainable governance.
- C. **Transparency** means all decisions made must be transparent in which all parties understand and engage in any decision. The decision made must be based on

verified information received and detailed for easy understanding. Any information related to dengue should be disseminated using educational and mass media channels.

- D. Responsiveness** involves responsible institutions in safeguarding public interest from the dengue. The Ministry of Health Malaysia should take responsibility for the needs of the community to channel medical aid and educate the community by various campaigns and seminars to improve their awareness of dengue.
- E. Consensus-Oriented** implies a comprehensive understanding of the community's issues, challenges, nature and social experiences in connection with dengue.
- F. Equality and Inclusiveness** depend on the inclusion of communities regardless of gender to preserve Malaysia's well-being against dengue. Every society must jointly protect the environment.
- G. Effectiveness and Efficiency** refer to efforts undertaken to combat dengue which involves various improvements to dengue prevention techniques. Efficient dengue management is also enhanced to ensure the well-being of communities to safeguard the interests of future generations.
- H. Accountability** pertains to the cooperation among institutions and society. All institutions and society are responsible for maintaining the environment to ensure that dengue problems can be dealt with successfully.

The combination of these factors will be forming good governance in controlling dengue cases to achieve sustainable development. The concept of sustainable development is to address the increasingly tangible social and environmental issues [17]. While the sustainability of good governance concepts is an alternative approach to addressing social and environmental issues more effectively [18]. Therefore, these eight factors with a combination of strategic management should be implemented in tandem with ensuring Malaysia is free of dengue.

3. STRATEGIC MANAGEMENT TOWARDS DENGUE

Strategic management is defined as the organizational strategy in making changes [19] which involve aspects of decisions and actions that formulate the implementation plan in achieving the goals of the organization [20]. Bourgeois et al. stated that the response of an organization is an important activity in strategic management [21]. As such, strategic management aims to achieve a sustainable competitive advantage that involves aspects of analysis, decision, and action.

To explain and gain a clear understanding of the issues concerning dengue, all parties involved directly or indirectly should scrutinize the causes, threats, and consequences of dengue. Through careful analysis, decisions need to be taken with due consideration of interest and risk on agreed decisions. The decision must be followed up with effective action so that good governance concepts can be achieved in combating dengue to preserve and conserve the environment. The World Health Organization [22] proposed a global strategy for dengue prevention and control which recommends five action points applicable for controlling dengue in Malaysia.

- A. Diagnosis and Case Management.** Dengue requires early notification and should be handled efficiently. The integration of cooperation between health service organizations is important to reduce dengue. Periodic monitoring should be continued. The provision of frequencies of dengue data distribution, weather change information and biological analysis reports on dengue vectors can improve the strategic management of dengue cases. Efficient data management on dengue through early clinical case detection can provide early warning before dengue worsens by enhancing alternative controls for the management of severe dengue cases.
- B. Integrated Surveillance and Emergency Preparedness.** Consensus should be reached whenever decisions are made by assessing the impact of dengue on the environmental, social and economic dimensions. Integrated surveillance entails a combination of critical components that provide information on ecological, epidemiological and entomological issues in risk assessment in any dengue control process. Trends in dengue should be monitored to detect transmission of the disease so that all consequences can be analyzed. Proper planning and resource allocation can then be channeled in the fight against dengue. Assessment of the surveillance program can provide lessons so that it can be a good starting point in addressing this problem in the future. In Malaysia, house and premise inspection for surveillance of potential Aedes mosquito breeding sites was carried out to ensure the protection of these premises [1, 23]. Malaysia also has a contingency plan and clear guidelines on readiness for the epidemic in case of an outbreak emergency. Malaysia also can apply the suggestions proposed by Rigau-Perez and Clark [24] in designing a dengue emergency response. These suggestions include establishing dengue action committees from various sectors with multidisciplinary expertise, improving surveillance of dengue vector diseases with an emergency response plan, improving diagnostic laboratory tests, protecting communities by reducing the negative impact on the environment, providing comprehensive care for dengue patients and involving relevant professional groups by giving the latest information on dengue using mass media to educate the public.
- C. Sustainable Vector Control.** A vector control program must be preserved to keep the environment safe from dengue. In Malaysia, the vector controls carried out involved environmental, biological and research on genetic control. Environmental control includes insecticide treatment with a fogging technique whether small or large scale [1]. Furthermore, larvicidal treatment techniques using temephos (Abate) are used as environmental control that does not harm humans when placed in reservoir water in the house [1]. Recent research has also introduced several innovations in environmental control techniques such as outdoor residual spraying, autocidal traps and insecticidal emulsion paint that are used to control adult Aedes mosquitoes [2]. Public health education, publicity, and health campaigns through television, radio, newspapers,

social media and seminars are few means to raise public awareness [1]. The Communication for Behavioural Impact (COMBI) introduced by WHO [25] also encouraged effective communication by delivering health messages to change the community's behavior to participate in the fight against dengue. COMBI also collaborates with the activities of *gotong-royong*, which involves the community to maintain cleanliness and environmental quality. Biological control has also been introduced, such as the use of bacteria such as *Bacillus thuringiensis israelensis* and *Wolbachia* to inhibit the growth of *Aedes* mosquitoes [1,2]. Genetically modified mosquitoes are used to control dengue by producing offspring that will die before reaching maturity, causing the *Aedes* mosquito population to decrease [1,2]. Various vector control programs have been conducted strategically to ensure the sustainability of the environment.

D. Implementation of Future Vaccine. Scientists are actively pursuing investigations to produce the right vaccines for the four serotypes of the dengue [2,26]. The injection of the dengue vaccine can improve one's immune system against dengue virus infection. However, no effective dengue vaccine has yet been produced for all four serotypes [27,28]

E. Basic, Operational and Implementation Research. Research is an indispensable tool to ensure that all the objectives of combating dengue can be effectively implemented. The improvement and upgrading of the dengue control method level show the potential for sustainable development. Clinical management must be emphasized wherein an effective method of combating dengue must be identified. Even the diagnostic aspects need to be further enhanced by introducing biomarkers of dengue infection. Management integration of risk mapping and analysis of data trends can be used as guidelines in formulating the decision-making process. Studies on the transmission of dengue and how this transmission can be controlled must be spearheaded as well. Dengue prevention techniques should be strengthened primarily in the production of vaccine booster that can enhance the resilience of communities in Malaysia.

The global strategy outlined can be implemented with good governance. Effective implementation of strategic management on dengue needs the authorities to do well and work efficiently. While the community must involve in dengue control in Malaysia. Therefore, both entities need to respond to each other. The authorities must enforce the law so that the community can comply with it. Hence, all types of dengue control programs or techniques should be informed and need to communicate with the society so that they can jointly participate in combating dengue. Everything that is done should be transparent without any protection so that all rights can be safeguarded. Regardless of race, religion or gender, all communities in Malaysia must cooperate in combating dengue.

4. MIRROR, MIRROR ON THE WALL: TRUST IN KEY PLAYERS, ATTITUDE TOWARDS NATURE AND TECHNOLOGY IS A KEY

The real picture in the mirror is something of reality rather than a fairy-tale fantasy. The worrying on dengue cases gives a reflection of the actions and how the whole community is in trusting their key players and attitudes in assessing nature and technology for the sustainability of governance in dengue control in Malaysia. Therefore, this study has conducted a quantitative survey on 399 respondents to evaluate their level of trust towards stakeholders, attitudes toward nature versus material and attitude towards technology. The questionnaire in the survey involved three variables (trust in the key player, attitude towards nature versus material and attitude towards technology) that have been adopted from previous researches [27, 29, 30]. The variables studied have the strength in assessing the good governance of dengue issues in Malaysia. Babbie et al. [31] stating that the survey is the best method of data collection in social science research because this method provides the right explanation for representing large populations like Malaysia. The survey has used random sampling techniques from September 2016 to September 2017 on adult respondents (aged 18 years and above) in the Klang Valley, Malaysia. Respondents consist of two groups of respondents, namely scientists and implementers consisting of governments, academicians, and researchers related directly and indirectly with the issue of dengue. Second, potentially vulnerable public groups with dengue fever infection located in the highest dengue hotspot in the Klang Valley. The Klang Valley was chosen as the location of the study because of this area was the highest dengue cases in Malaysia. The survey has been carried out in the Klang Valley area by the researchers.

Once data is collected, validity and reliability tests are assessed to determine the suitability of this survey to analyze the level of the variables studied. Cronbach's Alpha test is carried out when the Alpha value is good and acceptable when its value exceeds 0.70 to 1 [32]. The validity and reliability index of measurement instruments was shown in Table 1.

Table 1. The Index of Validity and Reliability of Measurement Instruments

Variables	Cronbach's Alpha Test (α)	No. of Items
Trust in Key Players		
1. Researchers	0.831	3
2. Industries	0.791	3
3. Government	0.780	3
Attitudes toward Nature versus Material	0.855	5
Attitudes toward Technology	0.897	6

Overall, respondents in Klang Valley claimed to have high trust in key actors (researchers, industries, and government). The respondents were keenly trusted in key players in terms of delivering information and have done a good job competently which contributed to the communities' best of interest (mean score of 5.42, researchers; 5.10, industries; 5.43, government) (see Table 2). The respondents expressed a moderate attitude

towards nature versus material (mean score of 3.91) and technology (mean score of 4.74). The respondents were more inclined towards nature than material and tended to more careful about accepting modern technology. They expected that humans lost respect towards nature because they more focused on profits rather than the development of nature.

Table 2. Mean and Standard Deviation for Trust in key Players, Attitudes toward Nature versus Material and Attitudes toward Technology

Items	Mean	Standard Deviation
Trust in Key Players		
1. Researchers from Universities and Research Institution.	5.42±1.06	High
a. Done a good job.	5.64±1.11	High
b. Contributed to the best interest.	5.37±1.25	High
c. Competent in carrying out their job.	5.26±1.31	High
2. Pesticides and Pharmaceutical Industries.	5.10±1.06	High
a. Done a good job.	5.25±1.11	High
b. Contributed to the best interest.	4.99±1.25	Moderate
c. Competent in carrying out their job.	5.06±1.32	High
3. Government sector on regulations.	5.43±0.99	High
a. Done a good job.	5.64±1.02	High
b. Contributed to the best interest.	5.35±1.32	High
c. Competent in carrying out their job.	5.32±1.23	High
Attitudes toward Nature versus Material	3.91±1.42	Moderate
1. Preserving nature versus the use of nature to achieve wealth.	3.92±1.96	Moderate
2. Centrally planned versus market-driven economy.	4.07±1.80	Moderate
3. Will stop on development at the expense of any risks versus accepting any risks in the attainment of wealth.	3.80±1.71	Moderate
4. Optimizes to protect the environment versus economic growth.	3.87±1.69	Moderate
5. Stressing nature is fragile and easily damaged versus stressing nature cannot be destroyed by human actions.	3.91±1.77	Moderate
Attitudes toward Technology	4.74±1.38	Moderate
1. Modern technology has made human lost respect towards nature.	4.54±1.77	Moderate
2. Modern technology has made humans more focused on profits.	4.84±1.52	Moderate
3. Modern technology has destroyed humanistic values.	4.73±1.60	Moderate
4. Modern technology will ultimately lead to humaneness extermination.	4.64±1.73	Moderate
5. Modern technology has upset the balance of nature.	4.76±1.58	Moderate
6. Modern technology has contributed to more problems and worries.	4.96±1.48	Moderate

*Note: 1-2.99: Low; 3.00-5.00: Moderate; 5.01-7.00: High

5. CONCLUSIONS

This study has contributed to the literature on strategic management for sustainable governance of dengue in Malaysia. Sustainable governance must be refined with strategic management to reduce the burden faced by the spread of dengue. This study also analyzed the level of trust in key players, attitudes toward nature versus material and attitude towards technology to assess the reflection on the attitude of the community and their belief in explaining good governance of dengue issues in Malaysia. This assessment was helpful for public reflection on dengue issues. Future researches may extend this study by collecting quantitative data through questionnaires or conducting a qualitative study regarding the effectiveness of good governance or effective strategic management in dealing with dengue issues associated with the variables studied in this study.

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