Exploring policy governance factors using stepwise multiple regression analysis: a case study of solid waste management policy in Malaysia

Muhamad Azahar Abas*

Faculty of Earth Science,
Universiti Malaysia Kelantan (UMK), Malaysia
Email: azahar.a@umk.edu.my
*Corresponding author

Seow Ta Wee

Faculty of Technology Management and Business,
Universiti Tun Hussein Onn Malaysia (UTHM), Malaysia
Email: tawee@uthm.edu.my

Abstract: This study was designed to explore the perception of stakeholders on solid waste policy governance in Malaysia. A total of 500 respondents were selected through random stratified sampling. The data of this study were collected via questionnaire distribution and were analysed by applying descriptive statistical analysis (mean, standard deviation and percentage) and inferential statistical analysis (t-test, correlation and stepwise multiple regression). The results of the study show that the perception of respondents on governance factors was varied, depending on the socio-demographic attributes of the respondents. Bivariate analysis reveals that all the policy governance factors are strong and positively connected to good governance elements practiced in solid waste policy implementation. However, multi regression model shows only three policy governance factors, namely resources management, policy implementation system and staff's competency significantly influence good governance practice of the stakeholders.

Keywords: policy governance; solid waste management; stakeholder; good governance; Malaysia.

Biographical notes: Muhamad Azahar Abas is a Senior Lecturer at the Faculty of Earth Science, Universiti Malaysia Kelantan (UMK) since March 2018. He graduated from the Universiti Tun Hussein Onn Malaysia (UTHM) with PhD, major in Policy Governance in 2017. Currently, he is actively involved in policy governance research which focusing on solid waste management policy in Malaysia.

Seow Ta Wee is an Associate Professor at the Universiti Tun Hussein Onn Malaysia (UTHM) since 2013. He graduated from the Universiti Kebangsaan Malaysia with PhD in Environmental Management major in Solid Waste Management, Master's in Environmental Management in 1999 and Bachelor's degree in Arts (Geography) in 1998. He actively involved with local authority to develop solid waste management programme, policy and researches.

1 Introduction

Cities of Malaysia have experienced rapid urbanisation and increasing population growth over the last few decades. According to the World Bank (2015), Malaysia is among the urbanised countries in Southeast Asia. Urban population in Malaysia has increased from 43% in the year 2000 to 53% in 2010 (UNDP, 2005). Currently, Malaysia has 19 urban areas with more than 100,000 residents.

The increasing population growth in urban area has given rise to issues of inadequate infrastructure and services which pose massive challenges to the local and federal governments (Dana, 1987; Nadzri and Larsen, 2008). Namely, the increase of economic growth, business activity and consumption rate among population has been found to accelerate the daily volume rate of municipal solid waste generated (Sreenivasan et al., 2012). Therefore, solid waste management services and infrastructures have become a fundamental concern in Malaysia's cities nowadays (Agamuthu et al., 2009). Effective municipal solid waste management (MSWM) is critically required to suit the current waste quantity and composition in urban areas (Latifah et al., 2009). However, effective solid waste management is difficult to attain in many developing countries, including Malaysia. This is due to the complex system of MSWM which encompasses planning, engineering, organisation, administration, financial and legal aspects of activities associated with the generation, storage, collection, transfer and transport as well as processing and disposal of the wastes (Tchobanoglous et al., 1993). One of components of MSWM focused in this study is solid waste management policy.
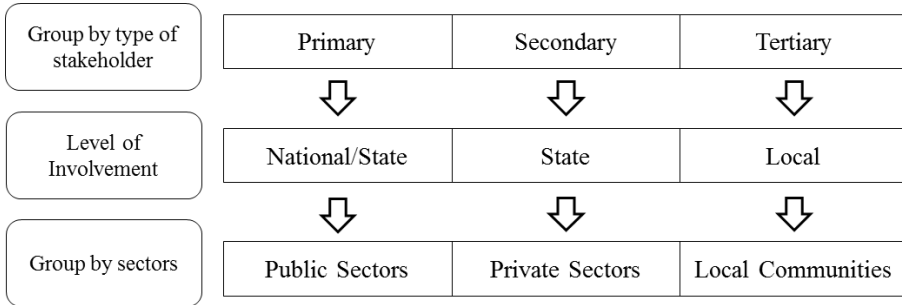
In Malaysia, the national solid waste management policy (NSWMP) was officially introduced in 2007 by the Department of National Solid Waste Management (DNSWM). The aims of NSWMP are:

1 to establish an integrated solid waste management system which is holistic, cost effective, socially acceptable and sustainable and which emphasises environment conservation, affordable technology and security of public health

2 to implement solid waste management based on its hierarchy by emphasising waste minimisation through reduce, reuse and recycling (3Rs), solid waste treatment and final disposal (DNSWM, 2016).

The goals of this policy have presented to many stakeholders, especially the relevant government agencies, a huge responsibility (Nadzri and Larsen, 2008). There are two primary stakeholders are involved in solid waste management in Malaysia which are

DNSWM and Solid Waste Corporation (SWCorp) (Figure 1). These stakeholders play vital roles in ensuring NSWMP coordination, monitoring and implementation and as such, they are known as the primary stakeholders (Abas and Wee, 2014). Moreover, they carry a key responsibility in ensuring the practice of good governance in NSMWP's implementation. However, good governance practice in policy implementation is influenced by policy governance factors.

Figure 1   Classification of stakeholders in Malaysia's solid waste management

Group by type of stakeholder	Primary	Secondary	Tertiary
Level of Involvement	National/State	State	Local
Group by sectors	Public Sectors	Private Sectors	Local Communities

Source: Abas and Wee (2014)

Previous studies have highlighted the influence of various factors of policy governance in maintaining the efficiency of good governance practice in policy implementation (Arentsen, 1991; Klok, 1991; Lockwood, 2010; Bjerkli, 2013). Many among them also emphasised that applying the elements of good governance in policy implementation is a valuable initiative and very helpful in achieving the aims and objectives of a policy. Arentsen (1991) and Klok (1991) discussed in particular the significance of capacity building and expertise in influencing good governance practice in policy implementation. However, this is not sufficient to explain and cover all policy governance factors that influence good governance practice in policy implementation. They considered only the factors that influence organisation competency by itself without taking into account other factors such as clarity of policy, resources management (RM) and policy implementation system (IS).

A number of empirical studies noted that clarity of policy is one of the crucial policy governance factors in policy implementation (Elmore, 1978; Matland, 1995; Hill and Hupe, 2006). Clarity of policy is influenced by the policy goal, policy pluralism, policy openness, political climate and autonomy. Correspondingly, Hockings et al. (2006) has developed a framework for governance effectiveness in policy implementation. The framework establishes that institutional capacity and supportive contexts are both prerequisites for effective governance. Institutional capacity is constituted by available resources such as human, financial, infrastructure and knowledge. Without adequate resources and appropriate processes, good governance cannot be effectively exercised (Abas and Wee, 2015). Furthermore, Frederickson (2004) found that a policy IS which consists of enforcement, monitoring and coordination is one of the crucial policy governance factors. The number of studies on the governance factors that influence the policy implementation in Malaysia is very limited. According to Abas et al. (2018), the governance factors like policy promotion, participation of stakeholders and stakeholder's capacity enhancement program is very crucial for effective NSWMP implementation in

Kuala Lumpur, Malaysia. However, further study is required to give comprehensive insight on the governance factors that influence NSWMP implementation in Malaysia wholly.

As been discussed above, the effectiveness of policy implementation is influenced by several significant policy governance factors. Accordingly, the identification of policy governance factors that affect good governance practice is essential in ensuring the effectiveness of NSWMP implementation. It is necessary to explore the stakeholders' perception on the governance of NSWMP to identify significant policy governance factors that influence good governance practice in NSWMP implementation.

2 Literature review

2.1 The concept of good governance and its practice

The World Bank first introduced the term 'good governance' in 1989 and promoted it throughout the 1990s. After that, it has become a much-used term, particularly in development aid agenda. Poor governance was claimed to be the reason for weak development, which instigated the promotion of political development and good governance agenda. Democracy is considered a prerequisite for sustainable economic growth which demonstrates respect to human rights (Abrahamsen, 2000). The argumentation behind the promotion of political development maintains that an effective and equality-oriented economic policy is attached to democratic and accountable regimes that value human rights. Not only do the donors embrace good governance agenda, they have further come to use it as conditions or selectivity criteria for providing aid by choosing countries that have already initiated political development programs (Degnbol-Martinussen and Engberg-Pedersen, 2003).

Governance can be defined in various ways and to perceive it as good is hence, rather subjective. Everyone wants good governance but what the concept embodies requires further elaboration. The implementation of good governance first and foremost depends on how governance is defined because it determines the area of operation. The understanding of governance changes from being a matter relating only to government to including something additional within politics, be it public policies, institutions, a system of economic relationships, or non-governmental bodies (Smith, 2007).

Governance perceived as government focuses on the management of the public sector and the legal and administrative capacity, whereas governance which includes politics focuses on:

> "…The way power and authority are exercised; the management of a country's affairs; the relationships between rulers and ruled; how conflict is resolved; how interests are articulated and rights exercised; and so on" (Smith, 2007).

Danish International Development Agency (DANIDA) which operates with the broad approach for good governance, thus includes elements within politics. The main focus is placed on the public sector in ensuring good governance. However, DANIDA (2007) recognises the importance of civil society groups and other non-state actors in holding the public sector accountable and in advocating needs and priorities. Hence, DANIDA has defined governance as government plus non-governmental bodies. The exact definition of good governance employed is described as the following:

> "...The transparent and accountable management of human, natural, economic and financial resources for the purpose of equitable and sustainable development, in the context of a political and institutional environment that upholds human rights, democratic principles and the rule of law" (DANIDA, 2007).

Moreover, the concept of good governance reflects the interest of the social science community in a shifting pattern within the styles of governing (Stoker, 1998). Since 1980, the theory of governance has been used to describe the change in the political process of western societies (Toikka, 2011). In fact, governance has traditionally been defined as government. Government refers to the formal institutions of the states and their monopoly of legitimate coercive power. Government is characterised by its ability to make decisions and its capacity to enforce them. In particular, government is understood to refer to the formal and institutional processes which operate at the level of the nation state to maintain public order and facilitate collective action (Stoker, 1998).

The contemporary theories on governance make a fundamental distinction between governance and government. However, the concept of governance covers broader issues when compared with the concept of government (Wolfgang, 1998). The different concepts established in both theories drew the attention of many scholars, namely to examine the reasons behind the shift of governing styles (Stoker, 1998). In fact, governments have the formal authority to act and the powers to enforce compliance with their activities, rules and policies. Therefore, stakeholders do not have the accessibility to interfere with the policy developed. In contrast, the concept of governance emphasises partnership with all stakeholders to empower them and to grant them equal access to development and decision processes. Hence, the power of decision-making and development is not limited to formal authorities and institutions. What is meant by good governance thus, encompasses elements of transparency, accountability, preservation of equity, implementation of sustainable development, respect for human rights and realisation of democratic principles. This illustrates the complexity of good governance in policy implementation. However, the main objective of good governance in a wide perspective is to enhance public administration.

The United Nations Development Programme (1997) underlines five main principles in the practise of good governance, which includes legitimacy and voices, direction, performance, accountability and fairness (Table 1). However, these good governance principles suggested by UNDP stand as a guideline to enhance organisation performance in the context of management and services. Meanwhile, good governance practices applied towards improving organisation performance has been explored in a number of previous studies (Juiz et al., 2014; Abas et al., 2018). The exploration of good governance practice is significant to address the issue of poor governance in NSWMP implementation.

2.2   *The significance of policy governance in solid waste management*

Policy as well as law is a tool used to control the activities of civilians to achieve certain aspirations meant for the public good. In the context of solid waste management, the policy was developed to reduce the impact of unsustainable waste management to human as well as to environment (Agamuthu et al., 2009). Recent issues involving the rise of solid waste production lead to a heightened need and significance of the policy to address solid waste management (Sreenivasan et al., 2012). The development of policy for solid

waste management serves as a guide for stakeholders who are involved either formally or informally in solid waste management processes such as waste generation, collection, transportation, treatment and final disposal.

Table 1 Good governance practices based on principles

Main principles	Good governance practices
Legitimacy and voices	• *Participation:* all gender should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their intention. Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively.
	• *Consensus oriented:* mediates differing interests to reach a broad consensus on what is in the best interest of the group and, where possible, on policies and procedures.
Direction	• *Strategic vision:* leaders and the public have a broad and long-term perspective on good governance and human development, along with a sense of what is needed for such development. There is also an understanding of the historical, cultural and social complexities in which that perspective is grounded.
Performance	• *Responsiveness:* institutions and processes try to serve all stakeholders.
	• *Effectiveness and efficiency:* processes and institutions produce results that meet needs while making the best use of resources.
Accountability	• *Accountability:* decision-makers in government, the private sector and civil society organisations are accountable to the public, as well as to institutional stakeholders. This accountability differs depending on the organisations and whether the decision is internal or external.
	• *Transparency:* built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them, and enough information is provided to understand and monitor them.
Fairness	• *Equity:* all gender have opportunities.
	• *Rule of law:* legal frameworks should be fair and enforced impartially, particularly the laws on human rights.

Source: Graham et al. (2003)

The policy is taken into account in each phase of solid waste management to ensure that the management of the waste is conducted effectively. In fact, the development of solid waste management policy in many countries, including Malaysia has been influenced by political interest and in some cases, by public choice, reflecting the problems that have emerged (Abas et al., 2018). Hence, the establishment of solid waste policy has been claimed to be an agenda to secure political benefits, indicating the action or initiative taken towards problem solving. Besides that, the pressure from public for better management in solid waste also forms the rationale of the development of solid waste policy in many countries.

Konteh (2009) identified the causes of failed solid waste management systems, namely due to inadequate formulation of realistic policies. As this factor have gained recognition, there has been a shift in the urban development literature, from 'government', which focuses on the role, responsibilities and performance of government bodies, to 'governance', which additionally considers the relationship between government and civil society in influencing solid waste management (Hardoy et al.,

2001). Good governance requires the participation and collaboration of all the relevant parties, including government, non-governmental organisations (NGOs), community groups and the private sector (Konteh, 2009). Good governance allows local community to influence policy and resource allocation (Hardoy et al., 2001).

Besides that, poor governance is the opposite of good governance and it involves the abuse of human rights, corruption, lack of transparency, lack of responsiveness and lack of accountability in policy implementation (Johnston, 2006). Moreover, the consequence of poor governance involves the inability of a public institution to manage public resources and the failure of a government to meet the needs of its society. Therefore, equitable, effective and efficient policy governance is essential.

Carver and Carver (2009) introduced a policy governance model that can be adopted for solid waste management. The policy governance model comprises five principles, which are: inclusion of all related stakeholders in policy processes and decisions, transparency and accountability of decisions making (unambiguous decisions), comprehensive guideline for the stakeholders, empowering of the stakeholders and monitoring of the stakeholder's performance based on the policy's criteria. This policy model emphasises the involvement of stakeholders in solid waste management policy processes and decision making. In fact, the public's involvement in the process of solid waste management goal formulation is essential to determine the actual needs of the citizens.

3   Methods

This study adapted a quantitative research approach by using questionnaire. The questionnaire was developed through an intensive literature review and was tested with a pilot study before it was distributed to the respondents. This section discusses several components of methodology such as selection of research area, technique of sampling and description of the questionnaire.

3.1   Sampling activity

This study applied the stratified random sampling method based on the heterogeneous demographic characteristic of the selected population, as drawn from the DNSWM and SWCorp. According to Konting (1990), stratified random sampling is a very suitable and compatible technique to draw information from a heterogeneous population. DNSWM has five departments, namely policy and strategic unit, approval and licensing unit, technical services unit, project management unit and management services unit. Besides that, SWCorp has 11 branches including headquarter. SWCorp are divided based on zone of authority which known as state such as federal territory, Negeri Sembilan, Melaka, Johor, Pahang, Terengganu, Kelantan, Kedah, Perlis, and Perak. The main objective of the sampling method selected in this study was to obtain a specific number of questionnaires from DNSWM and SWCorp, while taking into consideration the socio-demographic characteristics of the population.

Table 2   Socio-demographic characteristic of respondents, N = 500

Respondent's profile	DNSWM (%)	SWCorp KL (%)	Total (%)
Gender (%)			
• Male	18	67	42.5
• Female	82	33	57.5
Race (%)			
• Malay	94	94	94
• Indian	4	3	3.5
• Bajau	2	1	1.5
• Iban	-	2	1
Age (%)			
• 20–29 years old	36	56	46
• 30–39 years old	54	36	45
• 40–49 years old	6	6	6
• > 50 years	4	2	3
Education status (%)			
• Master	6	2	4
• Degree	20	21	20.5
• Diploma	38	23	30.5
• STPM	20	20	20
• Certificate	-	18	9
• SPM	16	16	16
Job position (%)			
• Engineer	20	3	11.5
• Enforcement officer	-	6	3
• Environmental officer	-	2	1
• Administrative officer	-	3	1.5
• Assistant accountant	6	-	3
• Assistant environmental officer	6	-	3
• Assistant engineer	12	-	6
• Assistant administrative officer	4	-	2
• Assistant enforcement officer	-	8	4
• Customer services officer	-	1	0.5
• Enforcement assistant	-	65	32.5
• Administrative assistant	52	6	29
• Technician	-	6	3
Working experience (%)			
• < 1 year	34	23	28.5
• 2–5 years	34	45	39.5
• 6–10 years	30	32	31
• > 11 years	2	-	1

In total, 500 questionnaires were collected, 60 from DNSWM and 440 from SWCorp (40 questionnaires each branch including headquarter). The characteristics of the sample are presented in Table 2. Socio-demographic characteristics of the respondents of both stakeholders were not significantly different, except for gender and job position. DNSWM has more female staff as compared to SWCorp. This can be explained by the function of stakeholders. DNSWM is responsible to formulate strategies and plans related to NSWMP. Meanwhile, SWCorp carries out a different role, namely to enforce regulations and implement NSWMP functions on the ground as well as on the field. This can explain the high percentage of male in SWCorp. The different roles of stakeholders also justify the particular job positions found here (Table 2).

3.2   *Questionnaire development*

The questionnaire was divided into six sections. Section 1 of the questionnaire explores the demographic information of respondents such as age, race, gender, education status, job position and working experience. Section 2 comprises statements related to respondent's perception on the clarity of NSWMP's context. In particular, four statements were presented to respondents. The first statement draws respondents' understanding on NSWMP's context. Second statement is related to respondents' perceived on each stakeholder responsibility that involved in NSWMP implementation. The third statement draws respondents' view on the promotion of NSWMP to stakeholders. The last statement in Section 2 deals with the rationality of NSWMP.

Section 3 is related to the perception of respondents on RM. Respondents were asked to state their views on budget management, staff management and expertise management. Section 4 comprises statements related to stakeholder's competency (SC). In this section, five statements were constructed by focusing on stakeholder's capacity, stakeholder's participation, stakeholder's commitment, stakeholder's leadership and stakeholder's motivation. Section 5 of the questionnaire focuses on NSWMP IS which comprises coordination, monitoring and implementation procedures. The final section focuses on the respondent's perception on good governance elements that have been practiced for the implementation of NSWMP. All questions in section two until six were measured on a five-point Likert scale, with the higher value revealing higher rate of agreement for the specific statements.

A pilot study was conducted on questionnaire before it was distributed to targeted respondents. In this study, 30 respondents from SWCorp Batu Pahat were engaged. The purpose of the pilot study was to measure the reliability of the questions (Cronbach's alpha coefficient) in the questionnaire. Previous studies revealed assorted acceptable values of alpha, ranging from 0.70 to 0.95 (Nunnally and Bernstein, 1994; DeVellis, 2003; Seow and Abas, 2015a). The reliability test shows that all the main variables constructed in questionnaire are reliable, with Cronbach's alpha values of more than 0.70 (Appendix).

Once all the raw data from the returned questionnaires were keyed in to Statistical Package for Social Science (SPSS), the normality test was conducted. The result of skewness and kurtosis test showed that all the data in this study were distributed within the range of between ±2.0, which indicate normal distribution (Appendix).

3.3 Hypothesis of the study

The following null hypotheses were constructed for the study.

H_{o1} No significant difference exists between the perception of DNSWM and SWCorp on NSMWP's governance factors.

H_{o2} No significant difference exists between DNSWM and SWCorp in terms of the good governance elements practiced for NSWMP implementation.

4   Results

4.1   Governance of NSWMP

Concerning primary stakeholder's perception on the four policy governance factors, the highest mean score among the four was recorded for SC (3.76) (Table 3). This result indicates that the stakeholder is competent in the context of capacity, participation, commitment, leadership and motivation in NSWMP implementation. The lowest mean score was obtained for IS (3.50), which involved the statement related to coordination, monitoring and enforcement of NSWMP. Furthermore, DNSWM indicated better perception on policy context, resources allocation and SC as compared to SWCorp. On the other hand, SWCorp showed better perception on the IS of NSWMP as compared to DNSWM. However, the difference in the perception of clarity of policy context, RM and IS did not indicate any significance (p > 0.05), except for SC (t [114] = 3.33, p = 0.001, two-tailed). Overall, the statistics revealed no significant difference between the perception of DNSWM and SWCorp's respondents on NSWMP governance factors (t [114] = 1.49, p = 0.137, two-tailed). Hence, statistical test (t-test) failed to reject the null hypothesis (H_{o1}) and thus, this null hypothesis is supported.

Table 3   Mean score for stakeholder's perception on the governance of NSWMP

Main variables	Mean (SD)		Average mean	Significant differences
	DNSWM	*SWCorp*		
Clarity of policy	3.68 (0.64)	3.54 (0.53)	3.61	t = 1.28, p > 0.05
Resources management	3.61 (0.76)	3.54 (0.57)	3.57	t = 0.55, p > 0.05
Stakeholder's competency	3.91 (0.49)	3.60 (0.50)	3.76	t = 3.33, p < 0.05*
Implementation system	3.48 (0.72)	3.52 (0.59)	3.50	t = 0.32, p > 0.05
Average mean:	3.67	3.55		t = 1.49, p > 0.05

Note: *The different mean score is significant at p-value < 0.05.

4.2   Good governance practices in NSWMP implementation

Another feature investigated through this study focused on the good governance elements practiced in NSWMP implementation. The results showed that the good governance element which scored the highest mean is rule of law (3.74) (Table 4). This result indicates that rule of law has been frequently practiced in NSWMP implementation. Besides that, the practice of transparency and responsiveness were seldom applied in

NSWMP implementation, as indicated by the mean score which was below 3.5. The different mean scores between DNSWM and SWCorp were not significant (t [114] = 0.43, p = 0.668, two-tailed). Hence, statistical test (t-test) failed to reject the null hypothesis (H_{o3}) and therefore, this null hypothesis is supported.

Table 4   Mean score for stakeholder's perception on good governance elements

Good governance elements	Mean (SD)		Average mean	Significant differences
	DNSWM	*SWCorp*		
Accountability	3.38 (0.83)	3.60 (0.62)	3.51	t = 1.61, p > 0.05
Transparency	3.28 (0.85)	3.53 (0.66)	3.42	t = 1.71, p > 0.05
Rule of law	3.76 (0.77)	3.72 (0.71)	3.74	t = 0.24, p > 0.05
Responsive	3.52 (0.81)	3.42 (0.72)	3.46	t = 0.67, p > 0.05
Consensus oriented	3.68 (0.68)	3.59 (0.61)	3.61	t = 0.42, p > 0.05
Effective	3.58 (0.88)	3.63 (0.57)	3.62	t = 0.74, p > 0.05
Average mean	3.53	3.58		t = 0.43, p > 0.05

Note: The different mean score is significant at p-value < 0.05.

4.3   Relationship between policy governance factors and good governance elements

The bivariate correlation analysis indicate that good governance practice is positively connected with the all policy governance factors (Table 5). A strong, positive relationship was found between good governance practice and all the policy governance factors, including clarity of policy context (r = 0.637, p < 0.001), RM (r = 0.891, p < 0.001), SC (r = 0.505, p < 0.001) and IS (r = 0.889, p < 0.001). Inter-correlations among the factors of policy governance indicated a strong positive correlation between them, ranging between r = 0.538 and r = 0.881 (p < 0.001).

Table 5   Correlation between the main variables with good governance practice

Scale		2 (PC)	3 (RM)	4 (SC)	5 (IS)
1	Good governance practice (GG)	0.637**	0.891**	0.505**	0.889**
2	Clarity of policy context (PC)	-	0.754**	0.724**	0.685**
3	Resources management (RM)		-	0.659**	0.881**
4	Stakeholder's competency (SC)			-	0.538**
5	Implementation system (IS)				-

Note: **Correlation is significant at p < 0.001.

4.4   Significant factors influencing good governance practice in NSWMP implementation: stepwise multiple regression analysis

Apart from exploring bivariate relationship, this article also explored the multivariate relations with the use of stepwise regression models. Four separate stepwise multiple regression analyses were carried out to investigate the significant factors that influence good governance practice in NSWMP implementation. The first stepwise multiple regression was conducted to identify the main significant variables that affect good

governance practice. The result of stepwise regression analysis showed only three policy governance factors (RM, IS and SC) which significantly influence good governance practice in NSWMP implementation. The factor of clarity of policy context was removed from the model (Table 6). Once the significant main variables were identified, stepwise regression was conducted again to identify significant the sub-factors that influence good governance practice.

The result of regression analysis revealed that all the model solutions (R^2) were significant at p < 0.001, which ranged from 0.404 to 0.849, indicating a respectable result (Table 6). The first model which consists of the main factor (RM, IS and SC) displayed the highest R square value (0.849), which means that the model explained 84.9% of the variance in good governance practice. The second regression analysis showed that the SC model (consisting of capacity and motivation) scored the lowest R-squared (0.404), which means that the model explained only 40.4% of the variance in good governance practice. For the RM model (consisting of staff management, expertise management and budget management) and IS model (consisting of enforcement, coordination and monitoring), 79.7% and 79.1% of the variance in good governance practice were explained, respectively.

Besides that, the stepwise regression analysis identified good RM as the most statistically significant factor ($\beta = 0.571$, $t = 6.54$, $p < 0.001$) that contributes towards good governance practice, followed by IS ($\beta = 0.445$, $t = 5.71$, $p < 0.001$) and SC ($\beta = 0.110$, $t = 2.24$, $p < 0.05$). In terms of the specificity of the resources model, staff management was found as the most significant factor ($\beta = 0.394$, $t = 5.29$, $p < 0.001$) that contributes towards good governance practice, followed by expertise management ($\beta = 0.571$, $t = 6.54$, $p < 0.001$) and budget management ($\beta = 0.571$, $t = 6.54$, $p < 0.001$). Meanwhile, for the IS model, enforcement system was found as the most significant factor ($\beta = 0.382$, $t = 4.82$, $p < 0.001$) that contributes towards good governance practice, followed by coordination system ($\beta = 0.356$, $t = 4.20$, $p < 0.001$) and monitoring system ($\beta = 0.307$, $t = 2.55$, $p < 0.05$). For the SC model, stakeholder's capacity was indicated as the most significant factor ($\beta = 0.466$, $t = 6.16$, $p < 0.001$) that contributes toward good governance practice, followed by motivation ($\beta = 0.321$, $t = 4.25$, $p < 0.001$).

Table 6 Stepwise regression analysis for variables that influence good governance practices

Model summary		Main factors	Sub-factors	β	t
Final model $R^2 = 0.849**$ $F = 210.26$	1	Resources ($\beta = 0.571**$, $t = 6.54$) $R^2 = 0.797**$ $F = 146.37$	Staff	0.394**	5.29
			Expertise	0.340**	4.05
			Budget	0.222**	2.54
	2	Implementation system ($\beta = 0.445**$, $t = 5.71$) $R^2 = 0.791**$ $F = 141.23$	Enforcement	0.382**	4.82
			Coordination	0.356**	4.20
			Monitoring	0.307*	2.55
	3	Stakeholder's competency ($\beta = 0.110*$, $t = 2.24$) $R^2 = 0.404**$ $F = 38.29$	Capacity	0.466**	6.16
			Motivation	0.321**	4.25

Notes: *Significant at p < 0.05 and **p < 0.001.

5   Discussion

This study aimed to explore the perception of primary stakeholders on governance practices and good governance elements practiced in NSWMP implementation. The study also sought to determine the significant policy governance factors that influence good governance practice in NSWMP implementation. The results presented contribute to the rapidly increasing discussion concerning the governance of policy and the need of good governance practice in the implementation of solid waste policy. The results from this study revealed that the DNSWM has a more agreeable perception towards the governance of NSWMP as compared to SWCorp. However, statistical analysis has failed to support the difference in the perception between both the primary stakeholders on NSWMP governance. This result is in contrast with the result of Nararajan (2011), in which different stakeholders or agencies demonstrated different perception on the governance due to different work experience among them. On the other hand, although both stakeholders in this study have different work experience, their perception on NSWMP governance was found to be comparable due to the similarity in the direction of their NSMWP implementation.

Moreover, this study also found that among the NSMWP governance factors, the respondents showed the most positive perception towards SC. Both primary stakeholders also indicated favourable perception towards stakeholder's capacity, participation, commitment, leadership and motivation. This is understandable because of the background of the respondents as government servants. Government servants tend to have positive perception on the SC because of their confidence on the good governance of NSWMP. However, the governance of policy IS is not as good as the governance of SC. These results show that the perception of respondents are not consistent to the elements of policy governance, as emphasised in previous studies (Wolfgang, 1998; O'Toole, 2000; Seow and Abas, 2015c). With regards to the good governance elements to be practiced in NSWMP, this study found transparency as the main issue which is lacking in its policy implementation. This result is consistent with several previous studies (Manasan et al., 1999; Issing, 2005; Adeosun, 2012). Ngidi and Dorasamy (2014) emphasised that transparency is one of the good governance elements that is very difficult to be practiced by many governments. Hence, improvements in policy IS and transparency in decision making are significantly required.

The present study found that the most important factor that determines good governance practice is resources allocation. This is supported by the bivariate and multivariate analysis conducted. The positive relationship between resources and good governance practice show that better resources allocation which includes staff, expertise and budget would lead to a more frequent good governance elements being practiced in policy implementation. In particular, adequacy of staff was found as the most significant predictor of good governance practice. This result is consistent with the findings obtained in previous studies (Bressers et al., 1994; Zanger, 2000). In fact, Betts and Wedgwood (2011) found positive association between resources and good governance practice. Moreover, the present study also reveals that an IS which includes enforcement, coordination and monitoring have positive relationship with good governance practice. This result provides further evidence for the significance of good governance practice in the IS (Ligteringen, 1998; Frederickson, 2004). This study also points out the positive relationship between awareness, policy context and SC with the good governance

practice. These results also confirmed the predicted direction and is consistent with the Seow and Abas's (2015b) research finding.

From the above discussion, it is interesting to note that some variables which were significant in the bivariate analysis were not significant in the regression models. For example, the main variables such as clarity of policy context on good governance practice were not significant variables in the final regression model. Only three main variables, namely resources, IS and SC were significant influence the good governance practice. Based on the SC regression model, only stakeholder's capacity and motivation were significant in contributing towards good governance practice in policy implementation. Due to the different propositions in each scenario, differences in the result of the regression model were expected, with some variables having stronger influence than others. However, this result also underlines the complexity of exploring the simultaneous impact of various factors on good governance practice in NSWMP implementation.

6 Conclusions

The finding of this study provided data on the perception of primary stakeholders towards good governance practices in NSWMP implementation. This study revealed that the perception of primary stakeholders on the governance of NSWMP were good. However, most of the respondents feel that improvement is required in the IS of NSWMP. In the context of good governance elements practiced, transparency is the element that requires significant attention. Besides that, this study disclosed that three policy governance factors, namely RM, IS and SC significantly influence good governance practice in NSWMP implementation. These findings provide an initial indication of the importance of these policy governance factors in influencing good governance practice in NSWMP implementation in Malaysia. Further research is necessary to understand the perception of secondary stakeholders like concession company, non-governmental agencies and local community on good governance practice in NSWMP implementation. This could provide a wider perspective on the governance of NSWMP.

References

Abas, M.A. and Wee, S.T. (2014) 'Sustainable solid waste management in Malaysia: the concept of multi-stakeholder governance in solid waste policy implementation', *Public Policy and Administration Research*, Vol. 4, No. 10, pp.26–35.

Abas, M.A. and Wee, S.T. (2015) 'A review of the factors that influence the good governance practices: an insight towards sustainable solid waste management', *International Journal of Conception on Management and Social Sciences*, Vol. 3, No. 2, pp.1–7.

Abas, M.A., Wee, S.T. and Chen, G.K. (2018) 'The practices of good governance in national solid waste management policy (NSWMP) implementation: a case study of Kuala Lumpur, Malaysia', *Advanced Science Letters*, Vol. 24, No. 6, pp.4710–4715.

Abrahamsen, R. (2000) *Disciplining Democracy: Development Discourse and Good Governance in Africa*, Zed Books Ltd., London.

Adeosun, A.B. (2012) 'Nigeria@50: the role of good governance and effective public administration towards achieving economic growth and stability in fledgling democracy', *International Journal of Politics and Good Governance*, Vol. 3, No. 3, pp.976–993.

Agamuthu, P., Hamid, F.S. and Khidzir, K. (2009) 'Evolution of solid waste management in Malaysia: impacts and implications of the solid waste bill 2007', *Journal of Material Cycles and Waste Management*, Vol. 11, No. 2, pp.96–103.

Arentsen, M.J. (1991) *Policy Organization and Policy Implementation*, University of Twente Press, Enscheda.

Betts, J. and Wedgwood, H. (2011) 'Effective institutions and good governance for development', *Evaluation Insight*, Vol. 4, No. 1, pp.1–11.

Bjerkli, C.L. (2013) 'Governance on the ground: a study of solid waste management in Addis Ababa, Ethiopia', *International Journal of Urban and Regional Research*, Vol. 37, No. 4, pp.1278–1287.

Bressers, H., Huitema, D. and Kuks, S.M.M. (1994) 'Policy networks in Dutch water policy', *Environmental Politics*, Vol. 3, No. 4, pp.24–51.

Carver, J. and Carver, M. (2009) *The Policy Governance Model*, Jossey-Bass, San Francisco.

Dana, L.P. (1987) 'Industrial development efforts in Malaysia and Singapore', *Journal of Small Business Management*, Vol. 25, p.74.

Danish International Development Agency (DANIDA) (2007) *Effective and Accountable Public-Sector Management – Strategic Priorities for Danish Support for Good Governance*, Ministry of Foreign Affairs of Denmark, Copenhagen.

Degnbol-Martinussen, J. and Engberg-Pedersen, P. (2003) *Aid-Understanding International Development Cooperation*, Zed Books Ltd., London.

Department of National Solid Waste Management (DNSWM) (2016) *National Solid Waste Management Policy: Aims and Objectives* [online] http://jpspn.kpkt.gov.my/index.php/pages/view/31 (assessed 01/06/2018).

DeVellis, R. (2003) *Scale Development: Theory and Application*, Sage, Thousand Okas, CA.

Elmore, R.E. (1978) 'Organizational models of social program implementation', *Public Policy*, Vol. 26, No. 2, pp.185–228.

Frederickson, H.G. (2004) *Whatever Happened to Public Administration? Governance, Governance Everywhere*, Queen's University Belfast Press, Belfast.

Graham, J., Plumptre, T.W. and Amos, B. (2003) *Principles for Good Governance in the 21st Century*, Institute on Governance, Ottawa.

Hardoy, J.E., Mitlin, D. and Satterthwaite, D. (2001) *Environmental Problems in an Urbanizing World, Local Solutions for City Problems in Africa, Asia and Latin America*, Earthscan Publications, London.

Hill, M. and Hupe, P. (2006) *Implementation Public Policy*, Sage Publication, London.

Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. (2006) *Evaluating Effectiveness: a Framework for Assessing Management Effectiveness of Protected Areas*, 2nd ed., IUCN, Gland.

Issing, O. (2005) 'Communication, transparency, accountability: monetary policy in the twenty-first century', *Federal Reserve Bank of St. Louis Review*, Vol. 1, No. 2, pp.65–84.

Johnston, M. (2006) *Good Governance: Rule of Law, Transparency, and Accountability*, United Nations Public Administration Network, New York.

Juiz, C., Guerrero, C. and Lera, I. (2014) 'Implementing good governance principles for the public sector in information technology governance frameworks', *Open Journal of Accounting*, Vol. 3, No. 1, pp.9–27.

Klok, P.J. (1991) *An Instrument for Environmental Theory*, University of Twente, Enscheda.

Konteh, F.H. (2009) 'Urban sanitation and health in the developing world: reminiscing the nineteenth century industrial nations', *Health and Place*, Vol. 15, No. 1, pp.69–78.

Konting, M.M. (1990) *Kaedah Penyelidikan Pendidikan*, Dewan Bahasa dan Pustaka, Kuala Lumpur.

Latifah, A.M., Mohd Armi, A.S. and NurIlyana, M.Z. (2009) 'Municipal solid waste management in Malaysia: practices and challenges', *Waste Management*, Vol. 29, No. 11, pp.2902–2906.

Ligteringen, J.J. (1998) 'The effects of public policies on household metabolism', in Klaas, J.N. and Ton, S.U. (Eds.): *Green Households: Domestic Consumers, Environment and Sustainability*, Earthscan, London.

Lockwood, M. (2010) 'Good governance for terrestrial protected areas: a framework, principles and performance outcomes', *Journal of Environmental Management*, Vol. 91, No. 3, pp.754–766

Manasan, R.G., Gonzalez, E.T. and Gaffud, R.B. (1999) *Indicators of Good Governing; Developing an Index of Governance Quality at the LGU Level*, Philippine Institute for Development Studies, Makati City, Philippines.

Matland, R.E. (1995) 'Synthesizing the implementation literature: the ambiguity-conflict model of policy implementation', *Journal of Public Administration Research and Theory*, Vol. 5, No. 2, pp.145–174

Nadzri, Y. and Larsen, I. (2008) 'Federalizing solid waste management in peninsular Malaysia', in *Proceeding of International Solid Waste Association (ISWA) World Congress*, Singapore.

Nararajan, N. (2011) *A Study on the Stakeholder's Perception of Corporate Governance Practices with Reference to the Software Companies in India*, PhD thesis, Educational and Research Institute University, India.

Ngidi, T.L. and Dorosamy, N. (2014) 'Imperatives for good governance: a case study of the implementation Batho Pele principles at Durban home affairs regional level', *Journal Social Science*, Vol. 38, No. 1, pp.9–21.

Nunnally, J. and Bernstein, L. (1994) *Psychometric Theory*, McGraw-Hill Higher, Inc., New York.

O'Toole Jr., L.J. (2000) 'Research on policy implementation: assessment and prospects', *Journal of Public Administration Research and Theory*, Vol. 10, No. 2, pp.263–288.

Seow, T.W. and Abas, M.A. (2015a) 'Developing tools to assess solid waste corporation's staff perception on good governance practices', *Australian Journal of Basic and Applied Sciences*, Vol. 9, No. 31, pp.459–463.

Seow, T.W. and Abas, M.A. (2015b) 'A study of awareness level on good governance among national solid waste department staff in Malaysia', *Advances in Environmental Biology*, Vol. 9, No. 27, pp.81–84.

Seow, T.W. and Abas, M.A. (2015c) 'Good governance practices in national solid waste management policy implementation: a pilot study on solid waste corporation's staff in Batu Pahat, Malaysia', *Australian Journal of Basic and Applied Sciences*, Vol. 9, No. 31, pp.445–451.

Smith, B.C. (2007) *Good Governance and Development*, Palgrave McMillan, Hampshire.

Sreenivasan, J., Govindan, M., Chinnasami, M. and Kadiresu, I. (2012) *Solid Waste Management in Malaysia: A Move towards Sustainability*, Intech., Landon.

Stoker, G. (1998) *Governance as Theory: Five Propositions*, Blackwell Publishers, Malden, USA.

Tchobanoglous, G., Theisen, H. and Vigil, S.A. (1993) *Integrated Solid Waste Management: Engineering Principles and Management Issues*, New York, McGraw-Hill.

Toikka, A. (2011) *Governance Theory as a Framework for Empirical Research: a Case Study on Local Environmental Policy-Making in Helsinki, Finland*, Unigrafia Bookstore, Helsinki.

United Nations Development Programme (UNDP) (1997) *Human Development Report 1997*, Oxford University Press, New York.

United Nations Development Programme (UNDP) (2005) *Malaysia Achieving the Millennium Development Goals: Success and Challenges*, United Nation Country Team, Kuala Lumpur.

Wolfgang, H.R. (1998) *Global Public Policy: Governing without Government*, Brookings Institution Press, Washington DC.

World Bank (2015) *East Asia's Changing Urban Landscape: Measuring a Decade of Spatial Growth*, The World Bank, Washington.

Zanger, S.C. (2000) 'Good governance and European aid: the impact of political conditionality', *European Union Politics*, Vol. 1, No. 3, pp.293–317.

Appendix

Table A1   The summary of internal consistency reliability test and normality distribution test

Policy governance factors		*No. of statements*	*Reliability test (Cronbach's alpha)*	*Normality test (skewness and kurtosis)*
1	Clarity of policy context	4	0.737	–0.59, 0.66
2	Resources management	3	0.739	–1.05, 1.58
3	Level of stakeholder's competency	5	0.753	–1.28, 1.62
4	Effectiveness of policy implementation system	3	0.934	–1.06, 1.61
5	Good governance elements	6	0.820	–1.26, 1.19