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The performance of the environmental management of local governments in Thailand

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ABSTRACT

This study evaluated the performance of the environmental management of local governments (EMLG) in Thailand and examined the relationship between specific management factors (context, input, and process) and output. Data were collected by using questionnaires with 385 local governments consisting of municipalities and sub-district administration organizations (SAOs) selected by multistage sampling and systematic random sampling countrywide. The findings revealed that the performance of the EMLG in Thailand was at a moderate level ($\overline{x} = 3.05$, SD = 0.442). The performance of both municipalities (urban areas) and SAOs (rural areas) was at a moderate level. However, the mean score for the overall performance of municipalities ($\overline{x} = 3.18$, SD = 0.391) was higher than that of the SAOs ($\overline{x} = 3.00$, SD = 0.453). The structural equation model (SEM) analysis indicated a significant relationship ($R^2 = 0.88$) between the context and the outputs (t-test = 7.59, $p < .01$) and between the inputs and the outputs (t-test = 2.07, $p < .05$). However, the SEM analysis indicated that there was no significant relationship between the process and the outputs (t-test = 0.40, $p > .05$). This study suggests four strategies for enhancing the performance of the EMLG: building sustainable culture; environmental learning organization (ELO); decreasing cost and increasing revenue; and precautionary environmental management.

Introduction

Decentralization has been an important strategy for achieving development goals, providing public services, and pursuing environmental conservation, and it has become a dominant theme in the discussion of environmental policies (Wittayapak & Vandergeest, 2010). Chapter 28 of Agenda 21 (United Nations Sustainable Development, 1992) has become a main concept which promotes local government responsibility for environmental management. In line with the decentralization process, environmental management has become a main function of local authorities.

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Local government management performance significantly affects the quality of life (QOL) of the people for whom local governments are responsible regarding basic public services, including town planning, provision of social and health services, education, water supply, business development, and environmental management (United Cities and Local Governments, 2008). This is important, especially today as the world is becoming increasingly urbanized. Rapid economic development causes environmental degradation, pollution, and also global warming, and therefore, the environmental management of local government is of high value for improving the QOL of people through good environmental quality.

Although many local governments are attempting to develop their environmental management systems, they face several problems that affect their environmental management performance (Emilsson & Hjelm, 2002; Lutz & Caldecott, 1996; Mitchell, 2002), such as a lack of clarity of goals, inadequate management structure, inadequate access to information, and conditions specific to developing countries. Thailand is classified as a developing country and has promoted decentralization for more than 80 years since the promulgation of the Municipal Administration Act, 1933. Local governments in Thailand are important organizations for promoting and conserving environmental quality because they are close to the people. However, some local governments in Thailand face environmental problems that cause various types of pollution, community waste, and land use problems which in turn affect the QOL of people (Pollution Control Department, 2013; Regional Environmental Office 4, 2013; Regional Environmental Office 11, 2013).

The evaluation of environmental management is an important measure for monitoring, analyzing, and evaluating the environmental management system (EMS) of local government. Such evaluation helps check the degree of achievement or value in regard to the aim, objectives, and results of any action that has been implemented. Further, the evaluation results help in decision-making to reduce the problems and enhance the environmental management. This study suggests ways to enhance the performance of EMLG based on the evaluation results of environmental management.

In order to obtain a better understanding of the performance of the EMLG, the researcher addressed two important issues: (1) the extent to which local governments in Thailand have succeeded in environmental management and (2) the factors affecting the performance of the EMLG.

Literature Review

Stufflebeam and Shinkfield (2007) stated that evaluation helps improve all aspects of society. They considered evaluation as the process of giving assertions on reliability, effectiveness, and efficiency among other things. During the 1960s, researchers began to analyze organizations from a system perspective, a concept taken from the physical sciences and presently, when we describe organizations as systems, we mean open systems (Robbins & Coulter, 2005). System theory has become a critical concept for the analysis and evaluation of organizations, both public and private.

One model that has been applied is based on the evaluation of the entity's context, input, process, and product (the CIPP model) and consists of: (1) context evaluations, which assess needs, problems, assets, and opportunities to help decision makers, and outcomes; (2) input evaluations, which assess alternative approaches, staffing plans, and budgets for their feasibility and potential cost-effectiveness to meet targeted needs and to achieve goals; (3) process evaluations, which assess the implementation of plans to help staff carry out activities and to help the administration make decisions regarding program implementation; and (4) product evaluations, which identify and assess the outcomes—intended and unintended—in the short term and long term, to help the staff keep focused on achieving important outcomes and to help the administrative board gauge the success of goals (Stufflebeam & Shinkfield, 2007).

The environmental management system (EMS) is the international standard specifying the requirements for an environmental management system to enable an organization to develop and implement policy and objectives, which take into account legal requirements and information about significant environmental aspects (International Organization for Standardization, 2004). It is intended to be applied to all types and sizes of organizations and to accommodate diverse geographical, cultural, and social conditions (International Organization for Standardization, 2004). These operating principles of an EMS follow a Plan-Do-Check-Act cycle (PDCA cycle).

Environmental management following the PDCA cycle would be beneficial to local governments by creating better opportunities to work more efficiently regarding environmental issues, decreasing negative environmental impact, and saving natural resources (Emilsson & Hjelm, 2002).

Materials and Methods

According to the literature, this study adopted the CIPP model (Stufflebeam & Skinkfield, 2007) for evaluation of the performance of the EMLG. The context consisted of the condition of the environment and public participation. The inputs consisted of human resources, budget, tools, and equipment. The process consisted of planning, implementation, monitoring and evaluation, and review and improvement. The outputs consisted of management results or environmental management performance regarding solid waste, wastewater, excreta, pollution, land use, and water source management (Department of Local Administration, n.d).

By integrating the evaluation of the EMLG with the CIPP model and environmental management standards for local governments in Thailand (Department of Local Administration, n.d.), this study proposed three hypotheses:

(1) context affects the performance of the EMLG; (2) inputs affect the performance of the EMLG; and (3) process affects the performance of the EMLG (Figure 1).

The study was carried out to examine the performance of EMLGs in Thailand. The study covered all types of municipalities and SAOs. From 7,775 local authorities, 2,440 municipalities, and 5,335 SAOs (Department of Local

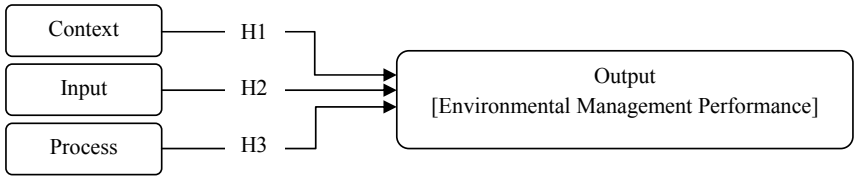

Figure 1 Conceptual model

Administration, 2014), the sample size needed for the study with a confidence level of 95% was at least 380 (Yamane, 1967) and the proportional stratified approach proposed that the samples should be 119 municipalities and 261 SAOs. One thousand five-hundred questionnaires were sent to local authorities throughout the whole country based on multistage sampling and systematic random sampling, and 385 complete questionnaires were returned, consisting of 122 municipalities and 263 SAOs. The key informants were administrators and officials of local governments that were responsible for environmental management. The questionnaire had 39 questions regarding for example, the environmental problems in the area, the level of people participation in environmental management; the level of executive attention to environmental management; the level of resources adequacy of environmental management; and the level of efficiency of the environmental plan, environmental implementation, and environmental evaluation. The questions were developed following the CIPP model (Stufflebeam & Skinkfield, 2007), environmental management standards for local governments in Thailand (Department of Local Administration, n.d.), and the objectives of the study. The respondents were requested to indicate the extent to which they agreed with the scale items by providing scores from "1 = very poor" to "5 = very good" (Verhoeven, 2011). Data were collected during the period from August to December 2015.

Statistical measures such as the frequency, mean, percentage, and standard deviation (SD) were used for measuring the performance of environmental management. There were five criteria for the interpretation of the performance of the EMLG, 1.00–1.80 = lowest; 1.81–2.60 = low; 2.61–3.40 = moderate; 3.41–4.20 = high; 4.21–5.00 = highest (Verhoeven, 2011). Moreover, in order to examine the relationship between specific management factors (context, input, and process) with the performance of environmental management (output), SEM was applied. The SEM test for the research had two steps: confirmatory factor analysis (CFA) and multiple regression analysis (MRA).

Results and Discussion

Background of Respondents

Out of the 385 questionnaires returned, more than two-thirds of respondents were SAO administrators and officers (68.31%) while 31.69 percent were municipal administrators and officers. Table 1 shows the background of the respondents separated by region, where the majority were from local governments in the northeast region (30.39%) followed by the central region (29.35%), the northern region (21.80%), and the southern region (18.44%).

Table 1
Number of respondents by region

Region	Frequency	Percentage
Northern		
- Municipality	30	7.79
- SAO	54	14.03
Total	84	21.82
Northeast		
- Municipality	32	8.31
- SAO	85	22.08
Total	117	30.39
Central		
- Municipality	32	8.31
- SAO	81	21.04
Total	113	29.35
Southern		
- Municipality	28	7.27
- SAO	43	11.17
Total	71	18.44
Total	**385**	**100.00**

Environmental Issues

Of the 385 sampled local governments, 335 reported environmental issues in their area, of which 83 were municipalities and 252 were SAOs. For the municipalities, 37.34 percent indicated that they faced solid waste problems. Moreover, they also specified that wastewater and air pollution were also serious problems in the municipal areas (32.53 and 16.87%, respectively). The highest percentage of environmental issues for the SAOs was solid waste (32.54%), the second highest was drought (25.00%), and the third was wastewater (18.65%). The details are shown in Table 2.

Environmental Performance

Table 3 presents the descriptive statistics for the EMLG performance in Thailand, which was at a moderate level ($\bar{x}$ = 3.05, SD = 0.442) and the mean score of all the factors (context, input, process, and output) also were at a moderate level of performance. The factor which had the highest score was context ($\bar{x}$ = 3.37, SD = 0.620), the second highest was output ($\bar{x}$ = 3.24, SD = 0.465), the next was process ($\bar{x}$ = 2.85, SD = 0.684), and the lowest was input ($\bar{x}$ = 2.77, SD = 0.719). The mean values for most of the variables were at a moderate level of performance. However, there were three indicators where

Table 2
Environmental issues in local areas

Municipalities		(n = 83)	SAOs		(n = 252)
Issue	Frequency	Percentage	Issue	Frequency	Percentage
1. Solid waste	31	37.34	1. Solid waste	82	32.54
2. Wastewater	27	32.53	2. Drought	63	25.00
3. Air pollution	14	16.87	3. Wastewater	47	18.65
4. Flooding	13	15.66	4. Flooding	39	15.48
5. Natural resources degradation	9	10.84	5. Air pollution	35	13.89
6. Noise pollution	7	8.43	6. Soil pollution	16	6.35
7. Drought	5	6.02	7. Noise pollution	7	2.78
8 Others	3	3.62	8. Others	5	1.98

Table 3
Results of descriptive statistical analysis

Variable	Very high	High	Moderate	Low	Very low	n = 385		Performance level
	(5)	(4)	(3)	(2)	(1)	Mean	SD	
1. Context factor								
Condition of environment	14.15%	26.75%	39.35%	15.60%	4.15%	3.31	0.841	Moderate
Public participation	9.43%	38.00%	38.63%	13.07%	0.87%	3.42	0.693	High
Performance of context	11.79%	32.38%	38.99%	14.65%	2.51%	3.37	0.620	Moderate
2. Input factor								
Human resources	8.07%	21.47%	31.03%	21.83%	17.67%	2.80	0.755	Moderate
Budget	6.10%	33.90%	24.95%	20.90%	14.15%	2.97	0.873	Moderate
Tools and equipment	1.85%	22.10%	26.75%	25.55%	23.75%	2.53	0.980	Low
Performance of input	5.34%	25.82%	27.58%	22.76%	18.52%	2.77	0.719	Moderate
3. Process factor								
Planning	5.95%	17.95%	35.20%	29.20%	11.70%	2.77	0.937	Moderate
Implementation	4.50%	17.60%	43.37%	29.93%	4.57%	2.88	0.725	Moderate
Monitoring and evaluation	10.13%	14.37%	28.57%	29.30%	17.83%	2.70	0.727	Moderate
Review and improvement	9.20%	18.45%	47.05%	17.40%	7.90%	3.04	0.912	Moderate
Performance of process	7.45%	17.09%	38.55%	26.46%	10.50%	2.85	0.684	Moderate
4. Output factor								
Solid waste management	7.80%	21.40%	40.40%	23.60%	6.75%	3.00	0.762	Moderate
Wastewater management	6.33%	14.27%	39.10%	21.80%	18.43%	2.68	0.699	Moderate
Excreta management	28.83%	40.87%	24.83%	3.73%	1.73%	3.91	0.693	High
Pollution management	22.70%	34.87%	33.00%	7.97%	1.50%	3.69	0.661	High
Land use management	10.83%	30.97%	42.23%	12.40%	3.53%	3.33	0.637	Moderate
Water source management	2.70%	19.10%	43.75%	25.55%	8.85%	2.81	0.714	Moderate
Performance of output	13.20%	26.91%	37.21%	15.84%	6.80%	3.24	0.465	Moderate
Performance of EMLG in Thailand	**9.45%**	**25.55%**	**35.58%**	**19.93%**	**9.58%**	**3.05**	**0.442**	**Moderate**

the mean scores were at a high level of performance (public participation, excreta management, and pollution management). In addition, the tools and equipment indicator, which assessed the adequacy and efficiency of the environmental tools (such as the refuse collection vehicle, mower, and pump) was the only indicator at a low level.

Table 4 and Figure 2 present a comparison between the EMLG performance of municipalities and SAOs. The mean score for municipality performance was higher than for the SAOs. The mean score for the input process and output factors of the municipalities was higher than those of the SAOs. This was probably attributable to the fact that most municipalities had a specific sector for environmental management and had greater preparedness in the management of environmental resources than the SAOs. Nevertheless, the mean score for the context of SAOs was higher than for the municipalities. This was probably attributable to the low population density and the fact that the main occupation of the SAOs was agriculture. However, presently, several rural areas have been developed into urban areas and this has increased the environmental problems in these areas. Therefore, enhancing environmental management to accord with the current context and future trends of local areas is important for both municipalities and SAOs.

Factors Affecting Environmental Management by Local Governments

This research first conducted a CFA by linking each item to its intended construct. For the first CFA, the factor loading value between the output factor and the excreta variable (0.28) was less than 0.30 (Hair, William, Babin, & Anderson, 2010). This indicated that the variable did not meet the minimal level for the interpretation of structure. Therefore, the excreta variable was cut before considering the second CFA. Regarding the second CFA, the three benchmark fit indices for the CFA model indicated a good fit of the model to the data (x^2/df = 1.89; CFI = 0.99; RMSEA = 0.048) based on the recommended criteria:

Table 4
Comparison of descriptive statistics

Variable	Municipality			SAO		
	n = 122		Performance level	n = 263		Performance level
	Mean	SD		Mean	SD	
1. Context						
Condition of environment	2.98	0.784	Moderate	3.46	0.824	Moderate
Public participation	3.34	0.681	Moderate	3.46	0.696	High
Performance of context	3.16	0.571	Moderate	3.46	0.620	High
2. Input						
Human resources	3.05	0.704	Moderate	2.69	0.753	Moderate
Budget	3.34	0.671	Moderate	2.80	0.901	Moderate
Tools and equipment	2.87	0.876	Moderate	2.37	0.986	Low
Performance of input	3.09	0.591	Moderate	2.62	0.725	Moderate
3. Process						
Planning	3.25	0.809	Moderate	2.55	0.913	Low
Implementation	3.22	0.699	Moderate	2.72	0.681	Moderate
Monitoring and evaluation	2.90	0.690	Moderate	2.60	0.725	Low
Review and improvement	3.17	0.825	Moderate	2.98	0.945	Moderate
Performance of process	3.13	0.620	Moderate	2.71	0.672	Moderate
4. Output						
Solid waste management	3.19	0.660	Moderate	2.91	0.790	Moderate
Wastewater management	2.69	0.654	Moderate	2.68	0.720	Moderate
Excreta management	4.01	0.637	High	3.87	0.715	High
Pollution management	3.70	0.658	High	3.69	0.664	High
Land use management	3.40	0.596	Moderate	3.30	0.653	Moderate
Water source management	3.05	0.638	Moderate	2.70	0.721	Moderate
Performance of output	3.34	0.398	Moderate	3.19	0.487	Moderate
Performance of Municipalities and SAOs	**3.18**	**0.391**	**Moderate**	**3.00**	**0.453**	**Moderate**

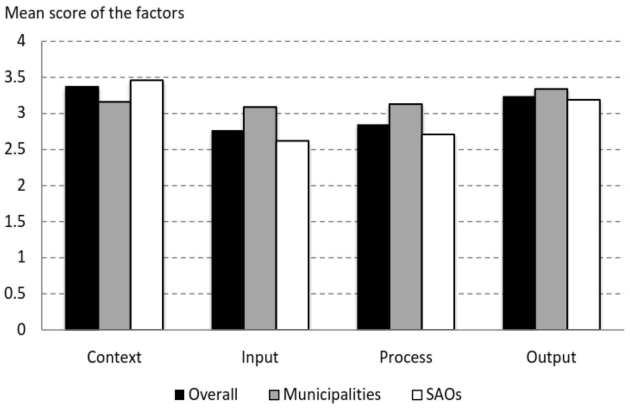

Figure 2 Performance of EMLGs in Thailand

$x^2/df < 3$ (Bollen, 1989) CFI > 0.90 and RMSEA < 0.05 (Hair et al., 2010).

Table 5 presents the results of the CFA. The t-tests were in range 19.85–7.32 and all of the results were significant at the 1% level ($p < .01$). All of the factor score regressions, including context, input, process, and output, were positive and in the range 0.68–0.01.

The results of the SEM ($R^2 = 0.88$) are shown in Figure 3 with the results of the regression analysis and t-test presented in Table 6. The three benchmark fit indices ($x^2/df = 2.77$; CFI = 0.97; RSMA = 0.068) indicated an acceptable fit of the model based on the recommended RMSEA < 0.08 (Hair et al., 2010). The factor score regressions of all factors (context, input, and process) were positive (0.76, 0.36, and 0.06 respectively). The results of the t-test indicated that the two hypotheses were confirmed by interpreting the regression coefficient which were: (1) context affects the performance of the EMLG (t-test = 7.59, $p < .01$), and (2) input affects the performance of the EMLG (t-test = 2.07, $p < .05$).

The findings highlighted the significant relationship between the context and the performance of environmental management. This supports Sabatier and Mazmanian (1981 quoted in Mitchell, 2002), who stated that implementation effectiveness was influenced by the tractability of the problem to which the action was addressed. Moreover, Mostert (2015) suggested principles for environmental management that the management scale should

Table 5
Results of confirmatory factor analyses

Variable	Factor loading (b)	t-test	R^2	Factor score regressions
Context				
Level of environmental problem (Problem)	0.36	7.32**	0.18	0.15
Level of public participation (Public)	0.49	10.15**	0.49	0.60
Input				
Human resources (Man)	0.55	14.30**	0.52	0.53
Budget (Money)	0.55	12.03**	0.40	0.11
Tools and equipment (Material)	0.64	12.56**	0.43	0.15
Process				
Planning (Plan)	0.79	19.26**	0.71	0.37
Implementation (Do)	0.63	19.85**	0.75	0.68
Monitoring and evaluation (Check)	0.48	13.80**	0.44	0.23
Review and improvement (Act)	0.52	11.07**	0.32	0.01
Output				
Solid waste management (Waste)	0.46	11.54**	0.37	0.24
Wastewater management (Wwater)	0.38	9.89**	0.29	0.15
Pollution management (Pollu)	0.34	9.41**	0.27	0.17
Land use management (Land)	0.41	12.26**	0.42	0.31
Water source management (Waterso)	0.37	9.36**	0.26	0.14
Goodness of fit statistics				
Chi-Square	107.550			
Df	57.000			
x^2/df	1.890			
CFI	0.990			
RMSEA	0.048			

**$p < .01$

Table 6
Results of regression analysis and t-test for factors affecting the performance of EMLG

Regression	Regression coefficient (b)	Standard error (SE)	t-test
$R^2 = 0.88$			
Context → Output	0.76	0.10	7.59**
Input → Output	0.36	0.17	2.07*
Process → Output	0.06	0.16	0.40
Goodness of fit statistics			
Chi-Square	171.700		
Df	62.000		
x^2/df	2.770		
CFI	0.970		
RMSEA	0.068		

*$p < .05$ **$p < .01$

match the scale of the management issues. Regarding the environmental management in developing countries, the implementation barriers include: meeting basic needs, alleviating the poverty of people, and solving environmental degradation, which are more serious than those of developed countries (Mitchell, 2002). Apart from the problem level in the areas, public participation is important in terms of integrating environmental considerations into local governmental planning and management because people are the direct users of the city environment (Cities Alliance, Local Government for Sustainability, & United Nations Environment Programme, 2007). Public and stakeholder participation in environmental planning can enhance effectiveness through improving the efficiency of decisions regarding the environment and enhancing implementation towards sustainable development (Drazkiewicz, Challies, & Newig, 2015; Emilsson & Hjelm, 2002; Gustafsson, Ivner, & Palm, 2015; Nishitani, Kaneko, Fujii, & Komatsu, 2012).

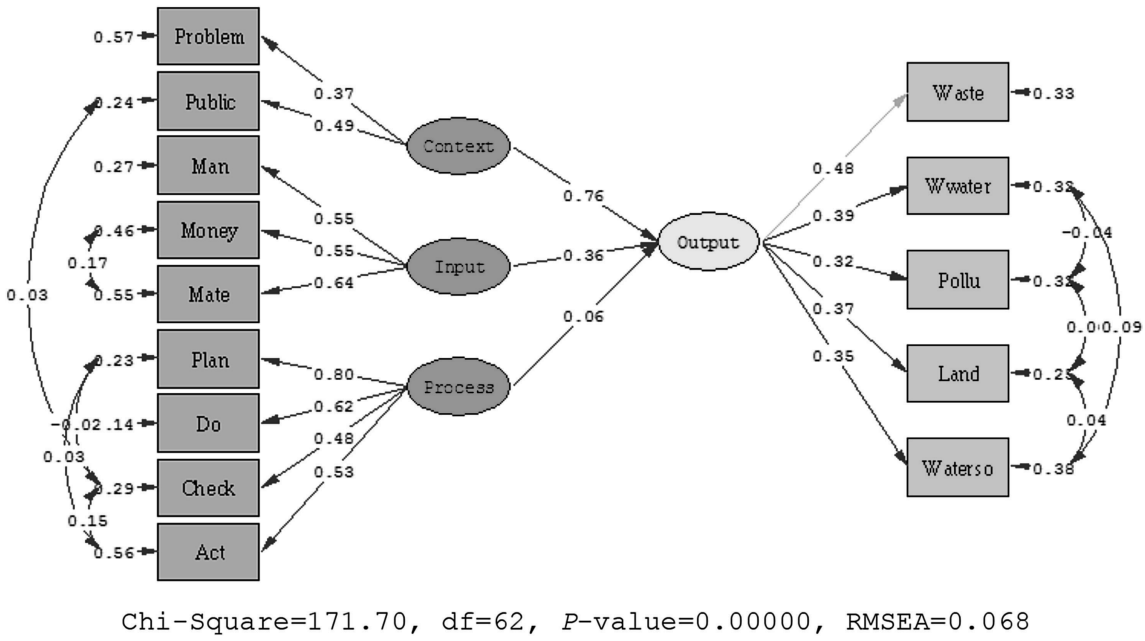

Figure 3 Results of SEM analysis

The analysis of the relationship between the inputs of environmental management and environmental management performance highlighted the significance of the relationship between them. This was in line with prior studies, which argued that materials, money, and human resources are the necessary resources for providing products and services (Bovee, Uhill, Wood, & Dovel, 1993; Jones & George, 2008; Mostert, 2015; Robbins & Coulter, 2005). Tung, Baird, and Schoch (2014) and Wee and Quazi (2005) suggested that top management's support for environmental management, the total involvement of employees, and training and rewards support the effectiveness of environmental management. Moreover, Fenton, Gustafsson, Ivner, and Palm (2015) suggested that clarity concerning financial aspects, such as setting the budget for environmental implementation, is a factor that influences the development of the local government environment strategy. Furthermore, the appropriate materials influence environmental management, as Jorgensen and Nielsen (2012) advised that ecological engineering is an important tool for solving environmental problems.

These findings are inconsistent with prior studies, which argued that good environmental processes have a positive association with environmental performance (Emilsson & Hjelm, 2002; Lozano & Valles, 2007; Melnyk, Sroufe, & Calantone, 2003; Wee & Quazi, 2005). However, when considering the results of the descriptive statistics (Table 4), the environmental performance of the SAOs, which was the major sample group, was not in accordance with the complete environmental process (PDCA cycle) while the context of SAOs had a high score that was probably attributable to their rural conditions. Therefore, the level of environmental problems and environmental complaints and disputes were low. This was supported by Hristovski, Hild, and Yong-Hristovski (2010), who stated that important problems in environmental management include inadequate management structure and planning and management without proper comprehensive analysis of existing situations.

Conclusion and Recommendations

The overall performance of the EMLGs was at a moderate level and all of the factors (context, input, process, and output) had a mean score at a moderate level of performance. The findings highlighted the significant relationship between context and inputs and the performance of environmental management. Based on these findings, this study suggests four strategies for enhancing the performance of the EMLG:

The First Strategy: Building a Sustainable Culture

The SEM analysis presented a significant relationship between the context (level of environmental problem and level of public participation) and the performance of the EMLG. The factor regression scores for context and output were positive (0.76) and the highest. Therefore, the first strategy suggests building a sustainable culture by raising the environmental knowledge and awareness of the people, changing the behavior of people to being environmentally friendly, and establishing social networks for supporting environmental activities.

The Second Strategy: Environmental Learning Organization

The SEM analysis presented a significant relationship between the input and the performance of the EMLG, and human resources were one variable among the factor elements. The regressions scores of the input and output were positive (0.36). Therefore, the environmental learning organization (ELO) is proposed to respond to the study results and to fill the gaps in the EMLG. This strategy aims to support and facilitate the local staff in learning how to improve their performance in the long term.

The Third Strategy: Decreasing Costs and Increasing Revenue

According to the SEM analysis, there was a significant relationship between the input and output, and the budget was one variable of the factor elements. The factor score regression of the input and output was positive (0.36), and the descriptive statistics, as shown in Table 3, presented the limitation of the tools and equipment regarding the environmental activities of local governments. Hence, the proposed strategy is to decrease costs and to increase revenue through three main concepts: green economy, command and control, and using a voluntary approach.

The Fourth Strategy: Precautionary Environmental Management

Table 2 presents the different environmental problems in urban and rural areas, municipalities, and SAOs. In addition, the results of the descriptive statistics demonstrate that the process performance of the SAOs, which are the major sample group, was an incomplete environmental management process (PDCA cycle) as shown in Table 4. Therefore, this strategy was proposed to reduce the impact on people and to minimize the damage on the environment from the environmental problems. Safety measures or precautions should be pre-planned before problems appear. Therefore, local governments should adopt environmental risk assessment (ERA) at every step of the PDCA cycle for reducing the environmental problems in their local areas in order to enhance the quality of life of people.

Figure 4 exhibits the relationship between the suggested strategies for enhancing the performance of the EMLG and the recommendations for driving the proposed strategies for both central agencies and local governments.

The central agencies should adopt the vision of better and sustainable local government environmental management as important policies in the long term which local governments must follow and issue clear environmental regulations because clear regulations that support the environmental management of local governments can enhance the effectiveness of their operations. Central agencies should create an environment of competition among local governments in order to persuade local government leaders and staff to enact the proposed policies. Pilot projects and guidelines that are supported by central agencies can provide a way to promote cooperation with

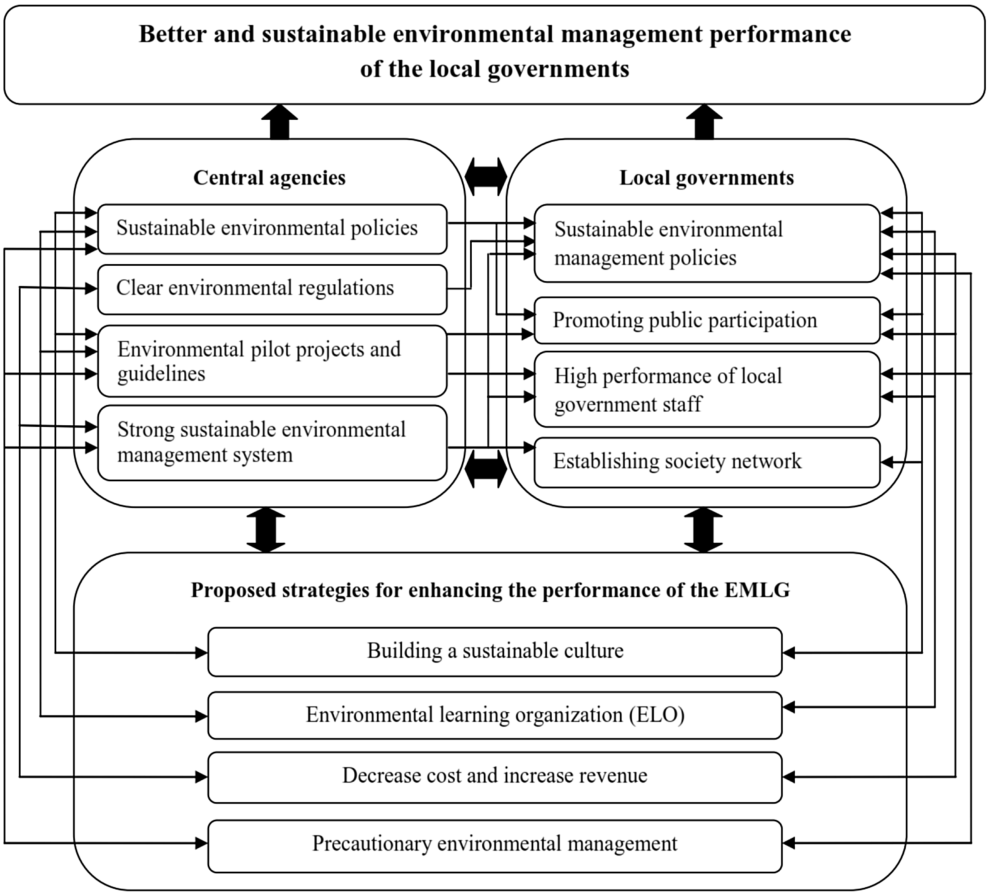

Figure 4 Proposed strategies and recommendations for driving the strategies

local governments in improving their environmental management. Moreover, central agencies should provide sufficient management resources, such as human resources and budgets, for the environmental management of local governments, especially small local governments. However, it is necessary for central agencies to support local governments to establish strong sustainable environmental management systems that can be operated without assistance from the central government in the long term. Additionally, the unity of the central agencies is very essential in driving the proposed strategies because it provides a clear understanding for local governments.

For the local governments, sustainable environmental management should be the main policy. Local governments should move towards environmentally friendly planning and management rather than just focusing on the problems that have already occurred or the construction of infrastructure, and they should promote public and stakeholder participation in environmental management through providing knowledge and raising the awareness of the people. In addition, improving the performance and raising public consciousness of local government staff are very important for enhancing their performance and local environmental quality in order to achieve sustainable management. Finally, establishing a social network that is appropriate for the local context can help local governments make their mission more effective and sustainable.

Conflicts of Interest

There are no conflicts of interest.

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