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What Motivates Environmental Leadership Behaviour---an empirical analysis in Taiwan

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ABSTRACT

Leaders in the public sector play a critical role in formulating and implementing environmental policies. However, existing studies mainly attribute policy actions and outcomes to institutional factors, while the roles of individual public administrators are largely ignored. This empirical analysis satisfies this gap by answering the following questions: Why do some administrative leaders do more than others in environmental protection? What motivates them? How does motivation work in various organizational contexts? We develop a model based on the literature on environmental leadership and environmental psychology, and then test it with first-ever data collected from a survey and in-depth interviews in Taiwan central government. We find that environmental leaders are motivated by both extrinsic instrumental causes for self-interests (economic opportunities or legal compliance etc.) and intrinsic normative reasons to engage in broad issues in sustainability, though the formers are clearly more influential. Moreover, environmental leadership is augmented in amicable institutional conditions for environmental protection. We discuss the relevance of these findings in environmental policies and management. This research contributes to the literature on and practice of the subject by examining the increasingly important situational leadership aspect of public management, which has hardly been studied, and unveils unique circumstances for decision making.

KEYWORDS

Environmental leadership; environmental policy making; public sector motivational factors, public policy and management in Taiwan

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Introduction

Studies of environmental policy and environmental management in the public sector have long focused on strategies, contexts, capacities, and stakeholder interactions at the institutional level (e.g., Egri and Herman, 2000, Li and Li, 2012, Wang *et al.* 2014). Recent studies have moved towards analyses at the network level (e.g., Jiao *et al.* 2015). However, few studies have examined the roles and impacts of individual administrative leaders on environmental policy making and management. In the private sector, a limited number of studies on environmental behaviour at the individual level have been conducted, in which the role of environmental policy making—namely, the contexts and processes of decision-making—were significantly different from those in the public sector (e.g., Graves *et al.* 2013, Ruepert *et al.* 2016). In addition, the literature suggests a significant role for individual leaders in policy making and policy implementation in the public sector (e.g., Wang *et al.* 2012). Significant unexplained variations in the policy outcomes in natural environmental and other natural-resource areas suggest that there are other explanations for environmental outcomes besides institutional or network behaviour and action.

Psychologists (e.g., Kollmuss and Agyeman, 2002) have identified that individual motivation is one of the significant variables to explain environmental behaviour of individual citizens (not institutional leaders). Due to different contexts in the public sector, the current literature on environmental psychology studies is insufficient to explain the environmental leadership behaviours of administrators at work. The purpose of this study is to explore the different motivations behind administrators' environmental leadership behaviour in Asian public sector where administrative leaders play a dominated role in policy making and implementation, and democratic institutional arrangements are yet to be well developed (Wang *et al.* 2016). Strong pressure for economic and population growth in the Asia-Pacific region is generally associated with depleted natural resources and high environmental costs, reinforced by lack of administrative expertise and enthusiasm in environmental projects that are often expensive and long term in benefit (e.g., Child and Tsai, 2005). Pursuing of economic growth has critical priority over environmental protection for Asian governments. In this particular context, little is known about the role of individual leaders in environmental policy implementation in the public sector.

In order to explore motivational factors affecting environmental leadership behaviour of administrators and to discuss route towards facilitating such behaviours in the Asian context, we develop a model that explains the motivations of public-sector leaders for their behaviour in relation to environmental protection. The resulting model was tested with empirical data (i.e., survey and in-depth interviews) from Taiwan central government, marking the first test of this kind. Facing economic pressure, the environmental record of Taiwan is among the best in the world (Child and Tsai, 2005; EPA, 2015). [1] The importance of the leadership roles of executives and senior public managers is ensured by its discourse on well-developed civil dialogue and democratic policy-making process (Berman *et al.* 2013*)*. The key research question asks what motivates environmental leadership behaviours of public administrators in Taiwan. The specific research questions are as follows: How prevalent are environmental leadership behaviours in the study setting? Do environmental motives, specified in theories, affect administrators' environmental leadership behaviours in the public sector, and how do these motives affect these behaviours? And how do contextual factors interact with these motives in influencing environmental leadership behaviours in the public sector?

The study contributes to the leadership theory by providing explanations of certain environmental actions and behaviours. Institutional approaches of previous studies, although necessary, leave significant gaps in our understanding of these issues while confronting unprecedented environmental challenges. There has been no attempt so far to develop a comprehensive understanding of the causes of leadership behaviours and how these motivations work. Additionally, unlike the previous research that very much emphasizes on instrumental incentives and rational decision making, this study discusses normative motives in environmental setting and looks into other paths of promoting pro-environmental actions of public managers rather than economic stimulation. It also contributes to the development of environmental management and practices by suggesting ways to improve the motivations underlying environmental action and by developing institutional facilitators for such motivations.

[1] EPA: United States Environmental Protection Agency

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Environmental Leadership Behaviours

Environmental leadership behaviour is practiced by administrative leaders in governmental organizations at different levels (Gallagher, 2012). This study views environmental leadership behaviour as a manifestation of administrators' leadership behaviours that primarily focus on motivating pro-environmental initiatives within the public sector. Leadership can be an abstract and vague notion if it is not clearly conceptualized (e.g., Yukl *et al.* 2002, Van Wart, 2011). Among various leadership studies, change-oriented transformational leadership appears to be especially relevant to pro-environmental initiatives beyond general and integrative models of leadership, and it provides helpful insights into environmental leadership behaviours (e.g., Portugal and Yukl, 1994, Berman *et al.* 2013). Transformational leadership theory is particularly related to environmental leadership in that both focus on the symbolic actions of leaders (regarding their impact as role models, their values, visionary sharing, and inspirational motivation), as opposed to "economic transactions between the leaders and the followers" (Graves *et al.* 2013). Both transformational and environmental leadership focus on encouraging followers to change their way of approaching problems, perceiving issues, and interpreting events (e.g., Graves *et al.* 2013).

So far, no pluralist model of leadership is developed specifically for environmental leadership. However, the framework of Portugal and Yukl (1994, p.3) provided the current literature as well as the present study with a basic conceptual framework for defining environmental leadership. Their classification is broadly viewed as the most comprehensive and best summarized conceptualization (e.g., Gallagher, 2012). They conceptualized environmental leadership by specifying three key elements: (a) articulating an appealing vision with environmental elements; (b) changing perceptions about environmental issues; and (c) taking symbolic actions to demonstrate personal commitment to environmental issues.

In general, environmental leadership on an individual level refers to a person who is more aware of eco-centric values and personally more committed to organizational change through various innovative approaches (Boiral *et al.* 2009). This study mainly focuses on the administrators' leadership involves the process of influencing followers to jointly and innovatively approach and address environmental problems (e.g., climate change) and the process of motivating others to care the welfare of society as a whole (Gallagher, 2012).

Moreover, environmental leadership is indeed situation-specific (Van Wart, 2013), which is enacted across a broad spectrum in myriad settings. However, studies into environmental leadership behaviours have frequently overlooked the role of contextual factors (e.g., Steg *et al.* 2014). Concerning the specific situation, the present study focuses in particular on the context of the public sector of Taiwan, in which environmental leadership is practiced by individual leaders in governmental organizations at different levels (Gallagher, 2012), as well as on specific leadership profiles that facilitate effective policy implementation. Environmental leadership behaviour of this study is regarded as a manifestation of administrators' leadership behaviours that mainly focus on motivating pro-environmental actions in public agencies.

Motivational Factors Influencing Environmental Leadership Behaviour

Among the currently recognized internal factors, motivation is one of the best indicators for predicting environmental behaviour (e.g., Müller-Peters *et al.* 1998, Kollmuss and Agyeman, 2002, Bamberg and Schmidt, 2003).Leadership researchers have extensively examined the motives for environmental leadership behaviour, with special focus on the private sector. However, the motives underlying environmental leadership behaviour largely depend on sector-specific characteristics (Runhaar *et al.* 2008). In this regard, the identified motivational factors in leadership studies, which focuses mostly on the private sector, is not sufficiently convincing for this study to examine environmental leadership in the public sector. Moreover, leadership studies focus mostly on organizational incentives, whereas only a few studies briefly mention the influence of personal intrinsic motivations on the environmental leadership, and none of those are empirical studies. Many environmental psychology studies explore the individuals' motivations that influence pro-environmental behaviour. The literature of this field views environmental leadership behaviour in public sectors as administrators' pro-environmental behaviour (abbreviated PEB hereafter) that "consciously seeks to minimize the negative impact of one's actions on the natural and built world" (Kollmuss and Agyeman, 2002).

Deriving materials from the literature on environmental leadership and environmental psychology, this study develops a framework that distinguishes instrumental motives, which stem from leaders' concerns about personal or institutional interests or benefits, from normative motives, which arise from leaders' judgement of the appropriateness of actions in serving the broad goal of building a sustainable society.

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Goal-framing theory (Lindenberg and Steg, 2007) identifies a hedonic and instrumental goal-frame, and a normative goal-frame. The framework clearly postulates that pro-environmental behaviour results from multiple motivations and that these motives are rarely completely homogeneous.

This approach, later refined and known as Integrated Framework for Encouraging Pro-environmental Behaviours (IFEP), rationalizes two paths for promoting PEB (Steg *et al.* 2014). First, reducing or removing the conflicts between hedonic and gain-related goals on the one hand and normative goals on the other. This path focuses on strengthening individual's instrumental motives, in which people take pro-environmental actions mainly due to self-interests, extrinsic needs or pressure (e.g., meeting legal and regulatory requirements and saving money). The second path is strengthening normative goals. It has been observed that a lot of people are indeed willing to participate in pro-environmental actions, even though such actions are financially costly or effortful (Steg and Velk, 2009). These people are more likely to focus on acting appropriately and their normative considerations will promote PEB or, more generally, moral actions. Different from the instrumental motives, normative concerns are rooted in a person's deep desire to abide by long-held beliefs and arise from individuals' judgement of the appropriateness of actions.

Contextual Factors Influencing Environmental Leadership Behaviour

Administrators who only possess desirable values and pro-environmental motivations may not be able to carry out environmental leadership actions successfully. (e.g., Runhaar *et al.* 2008). Environmental psychology studies indicate that various contextual factors can activate or constrain environmental leadership behaviours in a given situation (e.g., Kollmuss and Agyeman, 2002, Ruepert *et al.* 2016). The current literature identifies contextual factors influencing environmental leadership behaviours of administrators as perceived behaviour control (Ajzen, 2002); barriers caused by governmental policy (e.g., rigid rules obstruct innovation); and constraints caused by stakeholders (Runhaar *et al.* 2008). According to the theory of planned behaviour (Ajzen, 1991), individuals' perceptions of ease or difficulties should be regarded as an important contextual factor, which is expressed as perceived behaviour control in the model. Many studies have also shown that individual behaviour is largely influenced by people's confidence in their capability to engage in it.

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This study examines environmental leadership behaviour in the public sector, where institutional factors may have a strong influence on environmental leadership behaviour because the public sector is characterized by high levels of hierarchy and a bureaucratic decision-making system (Graves *et al.* 2013). Contextual factors of this study is defined by concerning two dimensions: the context/characteristics of institution and the characteristics of individual. For example, we include the stakeholder influence by asking the questions of whether citizens or department clients want environmental protection efforts, and policy barriers by asking whether legislators are supportive of environmental leadership, and perceived behaviour control by asking whether the leaders themselves have a good relationship with and significant personal influence on most employees in their agency may significantly affect environmental leadership behaviour in the public sectors.

In line with current theories on or related to environmental leadership behaviours, a model (see Figure 1) that links administrative leaders' instrumental motives, normative motives, and contextual factors with their environmental leadership behaviour is established and shall be examined using the environmental leadership survey data of Taiwanese governmental departments. The present study identifies four hypotheses:

H1: Administrators' instrumental motives are positively related to environmental leadership behaviour.

H2: Administrators' normative motives are positively related to environmental leadership behaviour.

H3: Administrators' normative motives are more salient in affecting environmental leadership behaviour than their instrumental motives.

H4: Contextual factors are related to environmental leadership behaviour.

[Insert Figure 1 about Here]

Methodology

Study Sample and Data

The present study draws on the 2013-2014 survey data of Taiwan's top-level (senior, high-ranking, and civilian) leadership in its national government departments. This research surveyed 376 administrative leaders in all central governmental agencies

including 33 ministries under the Executive Yuan, ministry/agency-affiliated institutions, line departments, and administrative/technical support organizations under each ministry. All positions of the sample population belong to the middle and highest classes of civil servants. These people were targeted because their leadership positions are more likely to allow them to gain first-hand knowledge of environment leaders actions and to become familiar with the environmental protection programs and efforts in their agency. Besides, Our sample include both leaders who are associate and non-associate with environmental institutions because the present study focuses in particular on the context of the public sector of Taiwan, in which pro-environmental actions is performed by people in leadership position of all ministries of the Executive Yuan, but not necessarily in environmental institution. Following the survey study, twenty semi-structured interviews with administrative leaders at different position levels of fourteen central governmental agencies was conducted. These interviews were used to interpret the survey results as well as to deepen the theoretical interpretation.

The in-person self-administered survey was implemented in two stages. In order to ensure that the questionnaires were individually answered by senior managers and not arbitrarily filled in by their secretaries or other staff members on their behalf, the trained interviewers were instructed to make appointments with the respondents, deliver the survey to their office in person, and stay nearby while they completed the survey. Due to this "foot-in-the-door" technique, the response rate (358/376=95%) is favourable enough compared to most response rates presented in the current literature, and there is no evidence for sample bias across the four subgroups of the sample frame or by gender. Additionally, a phone survey with 30 randomly selected non-respondents was carried out and did not show any significant bias, either.

Measuring Environmental Leadership Behaviour

Environmental leadership behaviour, the dependent variable, is measured with 12 items (listed in Table 1). Survey respondents were asked to indicate whether they had taken any of the environmental leadership actions that were listed in the questionnaire. Portugal and Yukl (1994, p.3) first identified the clear dimensions of environmental leadership, and theses have been widely used in the current literature. The present study likewise follows their framework by specifying three key elements. Firstly, articulating an appealing vision with environmental elements; secondly, changing perceptions on environmental issues; lastly, taking symbolic actions to demonstrate personal commitment to environmental

issues. The answers were given on a 7-point scale (from 1 = "strongly disagree" to 7 = "strongly agree").The Item Analysis in Table 1 shows the measurement's internal consistency. The Cronbach's α = 0.93, and the "Alpha if item deleted" for each subscale is below 0.93 in all cases, which means that none of the values are greater than the current alpha of the entire scale. The mean value of 12 items is 4.95.

[Insert Table 1 about Here]

Measuring Instrumental and Normative Motives

Instrumental motive is measured with six items by concerning the dimension of compliance, the aspect of agency self-interest and the perspective of their own individual interest (listed in Table 2). Normative motives are measured with five items, regarding the dimension of pursuing public interest and contributing to environmental problems, facilitating and participating in policy-making processes (listed in Table 2). The answers were given on a 7-point scale (1 = "strongly unimportant" to 7 = "strongly important"). Table 2 lists the internal consistency of the measurement of instrumental motives. The Cronbach's α = 0.756 and the "Alpha if item deleted" for each subscale is below 0.756 in all cases, which means that none of the values are greater than the current alpha of the entire scale. The item analysis in Table 2 shows the internal consistency of the measurement of normative motives. The Cronbach's α = 0.901 and the "Alpha if item deleted" for each subscale is below 0.901 in all cases.

[Insert Table 2 about Here]

Moreover, behaviour control is a significant control variable derived from planned behaviour theory (Ajzen, 1991). Based on the study of Ajzen (2013, p. 4), this study develops six items. Regarding stakeholder influence, respondents were asked to indicate whether citizens, their agency's clients, legislators are in favour of environment protection efforts. In addition, respondents were asked whether they think that the agency employees' positive attitudes regarding environmental protection affect their own environmental leadership behaviour. In the dimension of personal relationships and personal influence, participants were asked to answer whether they have established a good personal relationship with most employees and whether they consider this to be an important reason for facilitating their environmental leadership behaviour. Finally, respondents were asked to indicate whether they have a significant personal influence on

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their employees, whether their subordinates often comply with their requests, and how this may affect their willingness to take environmentally friendly actions. The Cronbach's α =0. 67. The answers were given on a 7-point scale (1 = "strongly disagree" to 7 = "strongly agree"). Besides behaviour control, this study identifies age, gender, education level, current rank of job position, and working age in the government and at the current job as control variable.

Findings

Motives for Environmental Leadership Behaviours

Respondents were asked about the specific motives of environmental leadership behaviours in the survey questionnaire. Table 2 shows how these motivational items were ranked by respondents, with analysis of the bivariate relationship between the motives and an environmental leadership behaviour index (ELBI in Table 2). All relationships are statistically significant at the .01 level. Specifically, Table 2 shows all six types of instrumental motives have a significant positive relationship with the overall environmental leadership behaviours ($p < .01$). Complying with environmental laws and regulations and promoting the image of the agency appear to have the strongest influence on leaders' pro-environmental behaviour (r = .42 and r = .47, respectively). Besides, all four types of normative motives have a very significant positive relationship with environmental leadership behaviours overall. Being part of society's solution to environmental deterioration and helping to alleviate the problem of depleted natural resources appear to have the strongest influence on leaders' pro-environmental behaviour (r = .477 and r = .482, respectively). Among various control variables, behavioural control (See Table 3) appears to have the strongest influence on leaders' ELB ($p < .01$, r = .602).

[Insert Table 3 about Here]

How motives affect environmental leadership behaviours?

In order to test the research hypotheses, the study established three separate ordinary least squares (OLS) models to examine the impact of administrative leaders' motivations on the environmental leadership behaviour index (see Table 4). The base model examines the influence of contextual factors on the environmental leadership behaviours of administrators that operate without motive variables, as opposed to Model 2, which

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includes two motive index variables at the aggregate level: instrumental and normative motives. Model 3 examines the impact of specific individual motivations that constitute the two motivation indices. The base model explains 35% of the variation in the PEB index, whereas the full models (Model 2 and Model 3) illustrate approximately 45% and 47% of the variation, respectively. All three models demonstrate the acceptable goodness of fit ($p < .000$ for the *F*-tests). Tests were conducted to examine possible violations of the model's assumptions in terms of linearity, multicollinearity, and homoscedasticity. No violations were found.

[Insert Table 4 about Here]

Among the 11 control variables in the base model, behavioural control and position level have the most significant impact on the environmental leadership behaviours of public administrators ($p < .01$), with behavioural control appearing to have a larger possible influence ($\beta = .516$) than position seniority ($\beta = .134$). Model 2 indicates that the two motivation variables have the most influential impact on the environmental leadership behaviours of public administrators ($p < .01$ and largest βs in the model). It was found that both instrumental and normative motives appear to have a positive and salient influence on the environmental leadership behaviours of administrators in Taiwan, with instrumental motives presenting a rather more salient possible influence ($\beta = 3.530$) than normative motives ($\beta = 3.195$).

In Model 3, the motive of complying with environmental laws and regulations is statistically significant at the .01 level; and the motive for increasing personal promotion opportunities may have a positive and important impact on leaders' PEB (statistically significant at the .05 level). Of the normative motives represented in Model 3, being part of society's solution to environmental deterioration is the only significant motivation variable with a bearing on the environmental leadership behaviours (significant at the .05 level). Interestingly, whether public administrators possess managerial positions affects their environmental leadership behaviours in all three models at the .05 level. This is consistent with the implications of Model 2 and Model 3: the environmental leadership behaviours of public administrators in the public sector are largely affected by their instrumental motives and, specifically, by the motives of complying with laws, job responsibilities, and increasing promotion opportunities. In addition, the contextual factor of behavioural control has a salient positive influence on the environmental leadership

behaviours of administrators in all three models at the .01 level, which suggests that the extent to which leaders feel able to adopt environmental leadership behaviours has a prominent impact on such behaviours in the public sector of Taiwan.

Discussion

The study has three important results. Firstly, it indicates that both instrumental and normative motives have a significant impact on the environmental leadership behaviour of public administrators, with instrumental motives of complying with environmental laws and regulations having a more salient influence. Strong legal and regulatory systems in environmental protection offer a fundamental force of constraint to the environmental behaviour of public administrators. In Taiwan, the environmental regulations and that specifically regulate the environmental leadership behaviour of public administrators are quite comprehensive. For example, according to the *Environmental Education Act*, all levels of public administrators are required to receive at least one four-hour environmental education course annually. In order to meet the requirements of the Act, various activities related to environmental education need to be organized in Taiwanese government agencies. The Act also stipulates ways of punishment for senior leaders if their subordinates fail to meet the requirements. In recent years, the Smart Energy Saving Program is another major regulation to control and guide the environmental behaviour of administrators. This program is specifically aimed at government agencies at all levels under the Executive Yuan, and stipulates specific implementation rules for saving power, water, fuel, and printing paper at work. Each agency is required to save a certain amount of energy, and a contest is held annually to present the results of energy saving.

With the comprehensive legal framework, public administrators' instrumental motives for complying with laws and regulations have been strengthened. Therefore, in the public sector, administrative leaders are more likely to demonstrate environmental leadership behaviours that carry out "regulatory support". They are more legally concerned, as this is the most basic prerequisite for their jobs, and they seek to avoid punishment and to gain rewards in supporting government laws, regulations, and relevant policies. In addition, strong external control (i.e., environmental laws and regulations) may weakens administrators' focus on acting appropriately and diverts their attention to non-environmental consideration. In such cases, public administrators are more likely to do what environmental laws and regulations stipulate, because of the importance of "law-

based administration" in the public sector. Hence, public administrators act pro-environmentally based on their own personal convictions about the public good, but are still strongly affected by instrumental motives when it comes to environmental leadership behaviour at work. In this case, administrators may cease to perform pro-environmental actions when the external control is removed (Ruepert *et al.* 2016).

Second, the results show that contextual factors, such as behaviour control and being a managerial position holder (i.e., heads and deputy heads of agency) appear to be significantly associated with environmental leadership behaviour in the public sector of Taiwan. Among a wide range of contextual factors, behaviour control has been found to have the largest impact. Specifically, whether or not legislators, superiors or colleagues are supportive of the environmental leadership behaviour of administrators largely determines the extent to which administrators consider it easy or difficult to take action. In the public sector, administrators' normative motives of engaging in environmental leadership behaviour need a sustained stimulation from the settings of government agencies （Steg *et al.* 2014, Ruepert *et al.* 2016）. When they feel they have good personal influence or their environmental leadership behaviour is supported by other people in the agency, they are more likely to take environmental leadership actions. However, it is not likely that public administrators will act upon their normative motives when environmental leadership behaviour is too costly and when they perceive significant obstacles to taking such actions. In addition, the position level of a job appears to have a strong impact. In many regions—especially in Asia where the public sector takes a predominant part in environmental policy-making and initiating pro-environment activities. Administrators in higher positions possess stronger decision-making power and are more likely to take pro-environmental actions.

Moreover, the results of the interviews show that financial support may help alleviate concerns about cost, and consequently promote environmental activities. Based on the laws and regulations, all ministries under the Executive Yuan and all governmental agencies at the central and local levels are required to budget a proportion of their expenditure for pro-environment activities, accordingly. This external support is critical for service provision and reassures those administrative leaders that wish to take more environmental leadership actions. Hence, when public administrators experience significant obstacles in the agency context, or when they feel their environmental leadership behaviour is in conflict with a major goal of the agency or their superiors,

administrators are less able to engage in environmental leadership behaviour, and thus override their normative considerations. They would feel they are too insignificant to make a difference in the agency. In this regard, creating a policy environment in the public sector that promotes, or at least does not constrain, administrators' pro-environment choices is of great importance. In this regard, if the contextual factors facilitate, or at least do not limit, individuals' pro-environment alternatives, administrative leaders are more likely to feel morally responsible to engage in environmental leadership actions.

Thirdly, the results show that the normative motive of being part of society's solution for environmental deterioration significantly affects the environmental leadership behaviour of administrators. Under certain institutional arrangements, individuals have a limited ability to improve the decision-making process in environmental policy formulation and implementation, and to promote environmental behaviours of others. However, being part of society's solution for environmental deterioration is a normative motive that administrators can act upon outside of their agency context. For example, regardless of whether their superiors or colleagues are supportive or not, they believe that "environmental leadership behaviour starts with me" and they lead by example. Those administrators can switch off their computers or lights during a break. In such cases, even though there might be some barriers to their environmental leadership behaviour within the agency, taking pro-environment action within their ability makes them feel as if they contribute to the environment protection of society as whole, and not only to the agency. These administrators may feel that, regardless of how small their action is, they can carry out environment leadership actions, starting with themselves.

Conclusion

Studies of environmental policy and management in the public sector have long focused on strategies, capacities, institutional interactions, and contexts at the institutional level. Little is known about environmental behaviour at the individual leadership level. Compared to business or non-profit leaders, public sector leaders face much complex decision making contexts and are driven by various motive factors, clearly manifested in environmental policy making and implementation. Understanding how motivational factors affect environmental leadership behaviour in the public sector helps add to the literature on leadership studies, but also offers important insight for public agencies to

develop proper leadership development strategies to promote such behaviours. This research has broadened the scope of environmental leadership studies to include the public sector, which fills the prevalent gap between significant environmental efforts in the public sector and the lack of research on this subject.

In light of still strong need for economic growth in many Asian countries, legal compliance is perhaps least costly and therefore most effective in persuading a leader to initiate an environmental agenda. However, environmental laws and regulations are a double-edged sword that only set the bottom-line for the environmental behaviour of administrators. In this regard, public administrators may only see sense when engaging in pro-environment actions that are stipulated by regulations, thus undermining the effect of normative motives. As a result, administrators may cease to perform pro-environmental actions when the external control is removed (Ruepert et al., 2016). Once the agenda moves into implementation, job responsibilities and career opportunities should be articulated by the leader to change employee perception and take actions. Importantly, leaders should find a path to sustain environmental leadership by engaging followers in a broad discussion on a society's solution to environmental deterioration. Finally, challenges of advocating environmental policies in a growth-oriented economy call for leaders to foster institutional support for environmental actions.

In short, policy instruments that solely focus on strengthening public administrators' instrumental motives may provide an unstable basis for developing sustained environmental leadership behaviour at work. For this reason, the creation of policy instruments that focus on strengthening normative motives is another path to promote environmental leadership behaviour in the public sector. Moreover, contextual factors can influence the environmental leadership behaviour of administrators in the workplace. In this regard, creating a policy environment in the public sector that promotes, or at least does not constrain, administrators' pro-environment choices is of great importance. Public administrators can carry out more environmental leadership actions prompted by their normative motives in such contexts as the workplace.

Nevertheless, this study has several limitations. First, the sample is from Taiwan bureaucrats at the ministry level. Future studies are needed to generalize the result to leaders in governments in other Asian countries where leadership behaviours may be

motivated differently. Moreover, the current study uses cross-sectional data from a survey and interviews. Longitudinal and archival data could be created in the future to examine patterns of environmental leadership motives and actions in long term and in more objective measurement. Yet despite these limitations, this research examines a topic that is critically important for environmental policy making and implementation in Asia, and it reminds us of the importance of leadership in an ever-changing socioeconomic and institutional context in many Asian countries and the complexity of leadership strategies to promote environmental policy making and implementation in a growth-driven environment.

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Figure 1. The Environmental Leadership Motivation Model

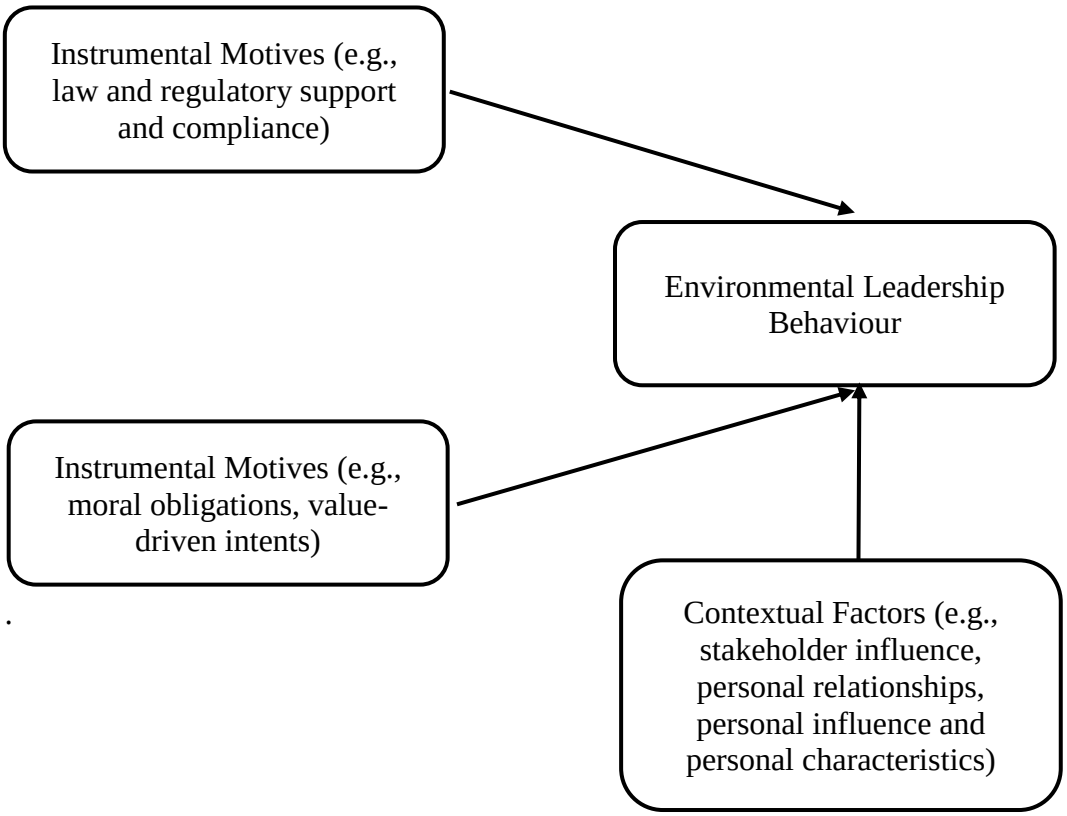

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Table 1. Item Analysis of Environmental Leadership Behaviours.

Statistics for Scale	N	Mean	SD
	12	4.95	.869

Survey Items	Mean (n=358)	SD	Mode	Cronbach's Alpha If Item Deleted
We have advocated to include environmental goals in our agency's vision or mission statement	5.06	1.281	6 (31.6%)	.926
We have communicated the need, value, benefits of environmental protection with agency workers	5.58	.900	6 (46.4%)	.926
We have employed facts, stories, and cases of ecological concerns to demonstrate the value of environmental protection	5.22	1.137	6 (31.3%)	.923
We have asked employees to consider environmental costs and benefits as a normal part of the decision process	4.85	1.236	6 (27.7%)	.920
We have held regular conversations with stakeholders inside and outside the organization in making sense of complex environmental issues	4.36	1.333	4 (33.0%)	.922
We have encouraged individual employees or my subordinates to get involved in green programs in our agency	5.12	1.087	5 (34.1%)	.923
We have encouraged our agency to adopt eco-friendly technologies or renewable or clean energy in operations (e.g., energy-saving light bulbs, electronic appliances or vehicles, solar, wind, geothermal heat)	5.36	1.096	6 (38.8%)	.925
We have supported to develop an agency website dedicated to green agency programs	5.05	1.157	6 (32.1%)	.922
We have acquired financial resources for our green programs	4.84	1.147	4 (33.8%)	.921
We have acquired technical support for our green programs	4.91	1.116	4 (31.0%)	.920
We have supported the proposals to increase funding for environmental protection programs	4.43	1.144	4 (47.5%)	.922
We have drafted or commented on legislation that increases our environmental sustainability efforts	4.58	1.243	4 (37.7%)	.923

Reliability Coefficients	Alpha	Standardized Item Alpha

	.929	.929

Source. Created by the author

Table 2. Item Analysis of Motives.

Survey Items				
Instrumental Motives	Mean (n=358)	SD	Cronbach's Alpha If Item Deleted	Relationship with ELBI (Spearman)
Complying with environmental laws and regulations	5.91	.878	.735	.419(.000) **
Saving money for the agency	5.63	1.041	.727	.321(.000)**
Competing better with other agencies for resources	4.87	1.084	.702	.338(.000)**
Promoting image of the agency	5.47	1.104	.686	.465(.000)**
Attracting private investment	4.14	1.447	.757	.272(.000)**
Increasing promotion opportunities of agency employees	4.41	1.338	.720	.327(.000)**
Reliability Coefficients		Alpha		Standardized Item Alpha
		.756		.770
Normative Motives				
Being part of society's solution of environmental deterioration	5.37	1.118	.897	.477(.000)**
Helping alleviate the problem of depleted natural resources	5.62	.977	.853	.482(.000)**
Improving decision making in environmental policy formulation and implementation	5.52	1.036	.859	.461(.000)**
Discovering meaningful ways to promote human activities with the natural environment	5.53	1.017	.882	.462(.000)**
Reliability Coefficients		Alpha		Standardized Item Alpha

		.901	.904

Source. Created by the author

Table 3. Descriptive Analysis of Contextual Factors

Survey Items		Mean (n=358)	SD	Relationship with ELBI (Spearman)
Behavior control		4.17	.506	.602(.000) **
Managerial position		1.23	.423	(p=.353)
Rank of current position	Level	1.74	.600	-.136(.000) **
	Degree	9.31	1.027	.248(.000) **
Seniority of current job	Years	3.50	6.505	.010(.852)
	Months	11	3.391	-.047(.383)
Seniority in government	Years	19.55	7.080	.292(.000) **
	Months	3.90	3.726	-.034(.530)
Gender		---	---	-.140(.009)
Age		47	7.690	-.273(.000) **

Education level	---	---	-.006(.908)

Notes: (1) Presented are Spearman correlation coefficients with significant levels in parentheses (**, Correlation is significant at the 0.01 level);
(2) Kendall's tau-c is obtained and shows similar results.
(3)ELBI=Environmental Leadership Index.

Table 4. Multivariate Regression Analysis of Environmental Leadership Behaviours

	Dependent Variable: Environmental Leadership Behavior Index					
	Model 1		Model 2		Model 3	
	β	*p*	β	*p*	β	*p*
Control Variables						
Perceived Behavioral Control Index	.516	.000	.381	.000	.388	.000
Managerial position (1=yes, 2=no)	.134	.012	.094	.055	.110	.026
Current rank of your current position (Level, 1=senior, 2=middle, 3=junior)	−.007	.927	−.005	.943	.019	.793
Current rank of your current position (Degree, number 1-14)	−.017	.833	.022	.773	.037	.633
Working age(Years) at your current job (__Years)	.008	.873	.007	.884	.020	.662
Working age at your current job (__Months)	−.046	.354	−.042	.358	−.020	.657
Working age in government (__ Years)	.084	.311	.092	.237	.090	.243
Working age in government (__Months)	−.029	.561	−.005	.909	.001	.991
Gender (1=male, 2=female)	−.056	.267	−.056	.235	−.045	.353
Age	−.103	.197	−.035	.639	−.035	.642
Education level (2-digit code)	−.074	.154	−.069	.157	−.060	.224

Independent Variables						
Aggregate Motivation						
Instrumental Motives	–	–	.196	.000	–	–
Normative Motives	–	–	.179	.002	–	–

(Continued)

Disaggregate Motivation						
Instrumental Motives						
Complying with environmental laws and regulations	—	—	—	—	.174	.002
Saving money for the agency	—	—	—	—	−.093	.101
Competing better with other agencies for resources	—	—	—	—	.083	.126
Promoting image of the agency	—	—	—	—	.065	.251
Attracting private investment	—	—	—	—	.011	.826
Increasing promotion opportunities of agency employees	—	—	—	—	.095	.022
Normative Motives						
Being part of society's solution of environmental deterioration	—	—	—	—	.133	.044
Helping alleviate the problem of depleted natural resources	—	—	—	—	.058	.499
Improving decision making in environmental policy formulation and implementation	—	—	—	—	−.034	.673
Discovering meaningful ways to promote human activities with the natural environment	—	—	—	—	.011	.880
R^2 adjusted	.320		.422		.433	
***p* for the F-test**	.000		.000		.000	

Note. "—" denotes not applicable