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THE PERCEPTIONS OF EMPLOYEES ON ENVIRONMENTAL MANAGEMENT DIMENSIONS: A STUDY AT TWO STATES IN THE SOUTHERN ZONE OF MALAYSIA

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Abstract

In recent years, many companies had to make their supply chains more sustainable by focusing not only on economic goals but also on environmental goals. Employee involvement is critical to the successful implementation of environmental management dimensions in the workplace. This study aims to determine employees' perceptions of the environmental management dimensions employed for a district council in the Southern zone state of Malaysia. Using a questionnaire, data were collected from 50 respondents (16 companies/facilities) in the Johor state and 32 respondents (17 companies/facilities) in the Malacca state. The main findings show that more than half of the respondents understood environmental management and were willing to consider environmental practices in their organisation/facility. This study also verifies the environmental issues that need to be considered in environmental management implementation. Relevant recommendations are then provided to facilitate an understanding of where the attention should be directed in developing and improving environmental management in organisations.

***Keyword**:* Internal Environmental Management, Environment Information Systems, Cooperation with Customers, Eco-Design Product, Environmental Organisational Culture, Environmental Leadership

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INTRODUCTION

Environmental management is an activity focused on describing and monitoring environmental changes for human benefit and minimising environmental degradation due to human activities. Environmental management is concerned with improving human needs and demands for building a better quality of life for humans and the habitat. Over the past decade, human activity has been a major factor contributing to reduced earth's carrying capacity; polluted water, land, and air; and depleted natural resources. Many countries have enacted environmental policies to manage pollution by reducing greenhouse gas emissions and protecting natural resources. Previous studies have concentrated on establishing a sustainable lifestyle in households, industries, and educational institutions. However, environmental protection is tied not only to national policy but also to an individual's knowledge and behaviour concerning environmental protection.

In the business world, organisations need to take on more significant responsibility for protecting the environment and implementing business strategies that involve managing natural resources and conserving the environment. Organisations can reap the advantages of environmental management, such as cut-down costs, enhanced revenue, positive reputation, achieving sustainability initiatives, and competitive advantage. However, their efforts to create internal green plans, run environmental management systems, and use certifiable standards have become inefficient when proper employee integration is not implemented (Foster et al., 2022). At times, they would face challenges in promoting several environmental management dimensions, which among others, include reducing energy consumption, green manufacturing, and using public transportation to promote cleaner production. Although these activities may not appear substantial on an individual level, they may considerably affect an organisation's environmental performance. Notably, employee involvement is crucial to successfully implementing environmental management dimensions in the workplace (Xu et al., 2022). For example, employees may use stairs instead of lifts, turn off unnecessary electrical appliances, avoid single-sided paper printing, reduce waste, and develop environmental preservation initiatives.

Besides the importance of employees' improving environmental performance, their involvement also helps solve environmental problems and is a good way for companies to improve environmental performance. Foster et al. (2022) also highlighted that the participation of employees in environmental initiatives is a complicated topic, and employees are encouraged to get involved voluntarily instead of being compelled to do so. Therefore, businesses can encourage employees to take greater environmental responsibility in the workplace to improve environmental management strategies. However, the effectiveness of environmental practices depends on how employees perceive

environmental concerns and their subsequent actions (Omarova & Jo, 2022). If they widely adopt business practices, including natural resource management and environmental protection, the negative environmental impacts can be significantly decreased.

Compared to households, environmental management dimensions among employees in the workplace have been limitedly studied. Several studies have compared green activities at home and the office and found that the same person would recycle more at home than at work (Lee et al., 1995; Yuriev et al., 2018). Another study (Lo et al., 2012) discovered substantial differences in energy-saving behaviours inside and outside an office due to the organisation's environmental management. Workplace environmental management dimensions refer to a wide variety of environmental actions related to internal environmental management, environment information systems, cooperation with customers, eco-design products, environmental organisational culture, environmental leadership, and environmental performance. The objective of the current study is to identify employees' perceptions of environmental dimensions at the Southern Zone State in Malaysia, focusing on the Johor State and the Malacca State. Seven dimensions of environmental management were based upon to examine the perceptions of employees at a district council that deals with environmental management both internally and externally. The dimensions used in this study are shown in Table 1.

Table 1: Description of environmental management dimensions from the previous study

Dimensions	Description	Reference
1. Internal Environmental Management	The commitment and support of a strategic organisational team on the programmes and initiatives of green management	(Sourvinou & Filimonau, 2018) adapted to suit the study requirements
2. Environment Information Systems	Information systems that are used to monitor environmental practices and outcomes	(El-Gayar & Fritz, 2006) adapted to suit the study requirements
3. Cooperation with customers	Requires input and feedback from customers on cleaner production processes on environmentally sustainable impact of green management	(Grekova et al., 2016; Zhu et al., 2017) adapted to suit the study requirements.
4. Eco Design Product	Manufacturers design products that minimise the consumption of materials and energy that facilitate the reuse, recycling, and recovery of component materials of green management	(Donnelly et al., 2006) adapted to suit the study requirements.

5. Environmental Organisational Culture	As a symbolic context about environmental management and protection within which interpretations guide behaviours and processes of members' sense-making.	(Jo Hatch & Schultz, 1997; Lozano, 2015) and adapted to suit the study requirements
6. Environmental Leadership	The leader that contributes to the achievement of environmental management	(Barling, 2015; Mino & Hanaki, 2013) adapted to suit the study requirements
7. Environmental Performance	The ability of manufacturing plants to reduce air emissions, effluent waste, and solid wastes and the ability to decrease consumption of hazardous and toxic materials.	(Soedjatmiko et al., 2021) adapted to suit the study requirements

RESEARCH METHODOLOGY

The study was conducted in the Southern Zone State in Malaysia, particularly the Johor State (Johor Bahru City Centre) and Malacca State (Bandar Hilir Malacca), with a focus on the industrial areas of the city centre of each state. The respondents were employees at various managerial, operational, and administrative levels in the related industries (Table 2). Data were collected from 50 respondents from 16 companies/institutions in the Johor State and 32 respondents from 17 companies/institutions in the Malacca State. A descriptive approach was employed to identify the employees' perceptions of environmental management dimensions. A survey questionnaire was adopted based on published works on environmental management dimensions and was adapted to meet the needs and requirements of this research. All responded questionnaires were personally collected by the researchers. Responses were sought on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), as shown in Table 3. The five-point Likert scale offers more than one response option, thus allowing the respondent to choose the best answer for each item. The questionnaire consists of 7 sections and 39 items. The percentage of the agreement mentioned is based on the number of responses indicating *agree* and *strongly agree*. The reliability for each of the environmental dimensions is presented in Table 4. Cronbach's alpha was used to measure internal consistency; a higher value indicates greater reliability of the items in describing their construct (Abd Majid et al., 2020).

Table 2: Total number of companies and institutions

Industry Category	Total No of /companies and institutions	Johor State (Johor Bahru)	Malacca State (Bandar Hilir)
Transportation equipment manufacturing	3	2	1
Automobile Industries	2	1	1
Car sales and service centre	4	2	2
Metal product manufacturing	3	2	1
Machinery manufacturing	3	1	2
Government Institutions	15	8	7
TOTAL	30	16	14

Table 3: The rating constructs

Measurement	Scales
1. Internal Environmental Management	**Five-point scale** (1 –not considering it; 2 – planning to consider it; 3 – considering it currently; 4 – initiating implementation; 5 – implementing successfully)
2. Environment Information Systems	**Five-point scale** (1 – not used at all; 5 – used to a great extent)
3. Cooperation with customers	**Five-point scale** (1 –not considering it; 2 – planning to consider it; 3 – considering it currently; 4 – initiating implementation; 5 – implementing successfully)
4. Eco Design Product	**Five-point scale** (1 –not considering it; 2 – planning to consider it; 3 – considering it currently; 4 – initiating implementation; 5 – implementing successfully)
5. Environmental Organisational Culture	**Five-point Likert scale** (1 – strongly disagree to 5 – Strongly agree)
6. Environmental Leadership	**Five-point Likert scale** (1 – strongly disagree to 5 – Strongly agree)
7. Environmental Performance	**Five-point scale** (1 – not at all; 2 – a little bit; 3 – to some degree; 4 -relatively significant; 5 - significant

Table 4: The Reliability of Environmental Dimensions

Environmental Dimensions	No of Items	Alpha Cronbach Value
1. Internal Environmental Management	4	0.765
2. Environment Information Systems	8	0.682
3. Cooperation with Customers	4	0.823
4. Eco Design Product	3	0.790
5. Environmental Organisational Culture	4	0.670
6. Environmental Leadership	4	0.790
7. Environmental Performance	12	0.677

ANALYSIS AND DISCUSSION

Table 5 presents the socio-demographic characteristics of the respondents (gender, age, race, level of education, work experience and monthly income). Most of the respondents from the Johor states and Malacca states were male (70% and 68%, respectively). All the respondents from the Johor state and Malacca state were Malaysian citizens. Most of the respondents were between 31–45 years old (45% from the Johor state and 70% from the Malacca state). The majority of the respondents were Malay (55% from the Johor state and 48% from the Malacca state). Most of the respondents have an undergraduate degree (diploma and degree) (25% from Johor state and 30% from Melaka state). The majority of respondents have 5 to 15 years of work experience in their companies and institutions. The monthly household income of most of the respondents from Johor state (40%) and Malacca state (45%) was between RM1,001–RM 5000.

Table 5: The demography profile of respondents

Demographic Categories	Category	Johor State (Johor Bahru) %	Malacca State (Bandar Hilir) %
Gender	Male	70	68
Age	31- 45 Years	45	70
Race	Malay	55	48
Education Level	Diploma /Degree	25	30
Work Experience	5-15 years	55	60
Monthly Income	RM 1,001–RM 5,000	40	45

Understanding environmental management is essential in determining a business organisation's or society's behaviour, which consequently influences decision-making (Samdin et al., 2012). Therefore, the current study sought to explore the perception of selected employees of companies and institutions on environmental management, as shown in Table 6. Internal environment management is essential to keeping track of performance, alerting decision-makers about behavioural changes, and leading companies to create environmentally conscious workplaces. Overall, the results indicate that less than 42% of the respondents agreed that they were committed to and supported the consideration of internal environmental management. More companies are changing their priorities by using business intelligence to save money and become environmentally aware. A clear roadmap of internal environment management is required to link business intelligence with environmentally friendly actions. Employees that participate in internal environment management not only reduce their operating expenses, reuse resources, and meet compliance requirements, but also help create brand recognition among customers.

Environmental information systems (EIS) are organisational-technical systems for systematically getting, processing, and making environment-related information available in companies (El-Gayar & Fritz, 2006b). In other words, EIS are essential for storing and managing all relevant data and information that respond to internal and external business environments pressures. EIS are also used to monitor environmental practices and support planning and management functions. In this study, 50% of the respondents agreed that EIS could provide information to consumers on the choices of car vehicles, improve decision-making by highlighting sustainability issues online, and reduce energy consumption. Most of the respondents also believed that the EIS can efficiently support the generation and distribution of renewable energy systems and limit carbon and other emissions. Fewer than 50% of the respondents knew how to use EIS to reduce transportation costs, track environmental information, and monitor emissions and waste production.

Customers' purchasing power, trust, and loyalty are boosted to provide a transparent environmental management plan. When it comes to being environmentally conscious, customers are not only more aware and informed, but they are also concerned about the well-being of their children. Therefore, they are demanding that businesses make better products for the environment. Companies also realise that when their customers become more environmentally friendly, they create a win-win situation for everyone, such as protecting the environment, improving corporate profitability, and opening up new market opportunities. As indicated in the finding, fewer than 56% of the respondents agreed that they are concerned about customer cooperation in environmental management. For example, they agreed they were concerned about cooperative customers for eco-design, cleaner production, green manufacturing, and energy saving during product transportation. The results of this study are consistent with Burki et al. (2019), who found that maintaining close cooperation with supply chain customers is geared towards reducing the negative impact on the environment.

Most of the adverse environmental impacts take place during the design phase. In this regard, design activity with sustainable development concerns is vital to pursuing sustainable supply chain management. Eco-designs are a crucial component of the circular economy; they are designed with sustainable materials and are reusable after their useful life, unlike the buy-use-throw-away or "linear" economy. Primarily, eco-design products are more committed to the product life cycle (from raw material selection to end-of-product life management) concerning the environment and are an effective technique for encouraging sustainable supply chain operations. According to Thamsatitdej et al. (2017), deploying products is crucial in improving the eco-design approach toward more sustainable supply chain management. The analysis found that less than 62% of respondents agreed that they consider the design of eco products to be due to

reduced energy consumption, ease of disassembly (reuse, recycle, recovery of material), and minimal use of hazardous materials during their manufacturing process.

The cultural aspects of environmental management are essential to transforming corporations from profit-oriented organisations into sustainability-oriented ones (Sugita & Takahashi, 2015). Companies are taking the initiative to create more environmentally conscious workplaces through their business cultures. Businesses now have to comply with environmental standards since the activities they engage impose significant problems for the surrounding environment. Many companies must reduce their ecological footprint to improve their environmental performance. Organisational culture is crucial to move toward more sustainable and environmentally friendly activities. In this study, more than 50% of the respondents surveyed agreed that their concerns are on knowledge, collaboration, environmental agreements, and responsiveness to environmental management. This finding is consistent with Magsi et al. (2018), who found that the environmental culture in an organisation supports its environmental performance and develops its environmental strategy.

"Leaders" in most firms are responsible only for handling matters pertaining to internal operations. However, an environmental leader needs to handle not only internal environmental issues (such as waste, pollution, and resource management), but also external issues, such as the safety of other communities and their environments. Those who advocate for environmental sustainability would integrate their goal of safeguarding the natural environment into their decision-making and actions. In this study, 65% of the respondents from Johor Bahru and 35% of the respondents from the Melaka state agreed that the leaders in their company inspire a shared vision of the organisation as environmentally sustainable, creating or maintaining green values throughout the company. The remaining half of respondents agreed that their company leaders have adopted various ways to conduct environmental management, such as well-developed approaches, creative partnerships with the company's stakeholders, and providing environmental education. These findings are aligned with Xu et al. (2022), who found that employees' green innovation behaviour is strongly correlated with environmental leadership's effect on the strength of their green company identity.

According to Kim et al. (2019), employee behaviour influences environmental performance sustainability. Environmental beliefs and personal preferences may affect employees' willingness to engage in environmental performance (Adeel et al., 2022). In this study, 47% of the respondents from Johor Bahru and 52% of the resopndents from the Melaka state greed that environmental performance is geared towards investing resources in green innovations to seize opportunities and successfully lead in the market. Also,

almost half of the respondents agreed that environmental management programmes and initiatives affect waste and air pollution reduction and lower resource consumption. These findings are similar to Hameed et al. (2020), who found that environmental performance is the critical practice of green human resource management; it requires employee behaviours to achieve an organisation's green objectives.

Table 6: Perception of environmental management dimensions among employees

	Items Statement	**% of Agreement on Consideration**	
		Johor State (Johor Bahru)	**Malacca State (Bandar Hilir)**
	Internal Environmental Management is committed to and supports the consideration of:		
1.	Environmental programmes and initiatives in and outside the organisation	33	23
2.	Environment total quality management procedures	42	25
3.	Environmental compliance and auditing programme	35	23
4.	Environmental concern incentives and reward	23	22
	The use of an Environmental Information System:		
5.	can reduce transportation costs	25	34
6.	can do tracking environmental information (such as toxicity, energy used, water used and air pollution) will be efficient	44	45
7.	can do monitoring emissions and waste will be effective	36	48
8.	can provide information to encourage choices of car vehicles by consumers	47	62
9.	can improve decision-making by highlighting sustainability issues online	52	53
10.	can reduce energy consumption	35	56
11.	can support the generation and distribution of renewable energy systems efficiently	43	65
12.	can limit carbon and other emissions through information system	34	73
	The cooperation with customers on environmental management on consideration:		
13.	for eco-design is fully cooperative	56	46
14.	for cleaner production is highly attached and committed	42	50
15.	for green manufacturing is on the good move	54	53
16.	for using less energy during product transportation is acceptable and reliable	36	41
	The consideration of the design of eco product will:		
17.	reduced consumption of material/energy	45	55
18.	be reused and recycled, and recovery of material and/or components	58	63
19.	can avoid or reduce use of hazardous and /or their manufacturing process	64	61

	The company that I worked for are concerned of:		
20.	the knowledge of environmental management and protection of environment	51	43
21.	the collaboration of environmental management and protection of environment	48	52
22.	the environmental agreements of environment	45	48
23.	the responsiveness of environmental management and protection of environment	35	60
	The leaders in the company that I worked for are:		
24.	inspire a shared vision of the organisation as environmentally sustainable, creating or maintaining green values throughout the company	65	35
25.	fully utilise and well-developed approaches to environmental management which generally centre around a programme customised to the company's specific business and market	32	38
26.	creative partnerships with the company's stakeholders to solve environmental problems and accomplish environmental goals	45	34
27.	responsible for environmental education with the intent of engaging employees in environmental management initiatives	33	40
	The adoption of environmental management programme and initiatives gives impact on:		
28.	Reduction of air emission	45	39
29.	Reduction of effluent waste	52	42
30.	Reduction of solid waste	29	43
31.	Decrease in consumption of hazardous/harmful/toxic materials	31	51
32.	Decrease in frequency of environmental accidents	38	42
33.	Improvement in and environmental situation	53	55
34.	Reduction of Water and land contamination	31	43
35.	Reduction of Air and noise pollution	37	54
36.	Reduction of Waste management	61	50
37.	Often undertakes active environment-related innovation to take initiatives on new practices or products ahead of the automobiles industry	48	45
38.	Continuously invest resources in green innovations to successfully seize opportunities and to lead in the market	47	52
39.	actively improve manufacturing processes to reuse, recycle, and reduce cost of energy	50	48

RECOMMENDATIONS AND CONCLUSION

In recent years, many companies have attempted to make their supply chains more sustainable by focusing not only on economic goals but also on environmental ones. Various stakeholders, including customers and employees, have pressured businesses to take greater environmental responsibility. Consequently, companies are shifting from conventional to sustainable ways by incorporating green activities into their operations to gain a competitive

advantage. Therefore, environmental management is essential to encourage employees to engage in green initiatives that are aligned with their organisation's corporate vision. This study verifies the environmental issues that need to be considered in environmental management implementation. The findings indicate that the environmental dimensions could generate many constraints and benefits affecting an organisation's success. It is hoped that the findings can benefit managers, practitioners, researchers, or policymakers and inform future research in this area. Some recommendations are put forward in pursuing environmental management in organisations.

Internal Environmental Management

The findings on "Internal Environmental Management" suggest that the commitment and support of environmental practices from top management towards environmental management should be reliable and available to consumers and employees through:

- Rules and regulations on the environment being spelt out clearly within the organisation
- Training and development being enhanced and precisely focused on the environment
- Policy compliance on the environment
- Continuous knowledge enhancement and education
- Reliable and manageable incentives and rewards

Environment Information Systems

The findings on "Environmental Information System" show that the requirement to stay focused systematically on Environmental Programme Systems through technology:

- Relative advantage (gains of usage)
- Compatibility (technical and organisational needs are applied)
- Trial-ability (experimental) of the system is always on the move

Cooperation with Customers

The findings on "Cooperation with Customers" show that there is a need to build up good cooperation and effective communication with customers through:

- Behavioural and attitudes positive to customers on providing information and education
- Awareness and benefits to the customer on the eco-design product
- Information and dissemination of programmes and initiatives

Eco Design Product

The findings on "Eco Design Product" show that it should provide efficient information on the eco-design of the product to encourage people to understand the eco-design purpose, particularly on the:

- Installation or upgrading of new equipment for the design
- Services of the eco-design product
- Processes of the eco-design product
- Policies for eco-design product
- Efficient enhancement of eco-design products

Environmental Organisational Culture

The findings on "Environmental Organisational Culture" suggest the need for organisations to build up the organisational culture environment positively and efficiently through:

- Effective and quality working life
- Increased job satisfaction in the environmental management
- Employee engagement and involvement in environment management
- Continuous organisational learning on environment management

Environmental Leadership

The findings on "Environmental Leadership" show that the leaders within the company should take on the responsibility of environmental education and responsibility effectively to the organisation and society by:

- Giving full commitment and cooperation to subordinate
- Building team-based leadership
- Cooperating with green leadership
- Communicating with subordinates on environmental management
- Shared vision and mission on environmental programmes and initiatives

Environmental Performance

The findings on "Environmental Performance" indicate the need for the management to educate their staff and customers on the benefits of environmental activities through:

- On-the-job training and development
- Quality assurance environment programme
- Research and development
- Promotion and evaluation of green initiatives

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