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Governance in Occupational Safety and Health in the Aspect of Indoor Air Quality in Malaysia

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Abstract

Occupational safety and health are a field that is often attracted by various parties and organizations and is a modern social movement. The issue of the deterioration of indoor air quality in the work environment is one of the environmental issues. However, when discussing the issue of indoor air quality in terms of occupational safety and health in Malaysia, most of the studies conducted were more focused on the aftermath of indoor air quality and steps its escort to ensure internal air quality problems in the work environment are more temporary. The implementation of governance in occupational safety and health in the aspects of indoor air quality in Malaysia is divided into two, through legal and non-legal methods. Based on the basic beliefs of sustainability governance there are two main approaches namely holistic approach and reductionism. Thus, this study discusses whether the implementation of governance in occupational safety and health governance in the aspects of indoor air quality is influenced by one or a combination of holistic approaches and reductionism based on the analysis of relevant documents. The findings show that each approach has its own payoff and importance in ensuring the implementation of governance occupational safety and health with the involvement of various and structured stakeholders.

Keywords: Occupational Safety and Health, Sustainability Governance, Holistic, Reductionism, Indoor Air Quality

Introduction

Occupational safety and health are a branch in safeguarding the safety, health and welfare of workers and people in workplaces. It is aligned in the current flow of industrialized flow of industrialization that relates to the safety and health aspects of workers especially in factories, city mines (Rosner & Markowitz 1987). Improvements in product development, machinery or technology development have created hazards or disasters to workers in terms of
safety, health and environment (Kadir 2004). However, at the very beginning of global industrial development, the awareness of the safety and health of workers was very low because at that time most of the country’s focus, institution parties, companies and employers only concentrated on raising profits alone. The workers at that time were as intermediaries in the production of an output alone. At the same time, the use and exploitation of natural resources is used to the maximum possible.

In Malaysia, the focus on workers' safety and health is from early 1878 (Manimaran 2002). Prior to the 1980s, only the personnel department handled employee-related matters such as selection and file systems. The task of this section is in a small and structural form where routine tasks without the need for renewal and innovation in carrying out tasks. However, the ever changing organizational environment from day to day in line with the development era has led to human resource management has become important in every organization known as Human Resource Management Department located under the Ministry of Human Resources. This department is responsible for all matters involving employees and organizational management including occupational safety and health issues in the industry and human resource management has become an important element for all large companies and small and medium industries (Junaidi 2004).

Occupational safety and health in the aspect of indoor air quality in ensuring safe and healthy working environment in Malaysia has been getting attention from year to year since the awareness of clean air and safe inner space throughout the work area and complaints received by employers and employees and studies Researchers on the deterioration of indoor air quality. Internal air quality is indoor air quality that can lead to comfort, health (Yau et al. 2012) and productivity of workers (Wargocki 2000).

Indoor air quality is a term that refers to the indoor air quality, surroundings and structures of the building and it also relates to the health and comfort of the person in the building (Latif et al. 2009) and is also defined as the air properties as a whole and give a health and wellness effect to someone. As people spend around 87 percent in indoor buildings such as homes, offices, restaurants and others (Yang & Heinsohn 2009). Therefore, the US Environmental Protection Agency (USEPA) recommends indoor air quality issues as one of the environmental risks, especially in distressed buildings (Goyal & Khare 2011).

However, when discussing the issue of indoor air quality in terms of occupational safety and health in Malaysia, most of the studies conducted were more focused on the aftermath of indoor air quality (Bandli & Gunter 2006, Lippmann 1990, Spengler & Qingyan 2000) and steps its escort to ensure internal air quality problems in the work environment are more temporary. This can be seen in the case of 2004, a case of "fungal attack" occurred at the Sultan Ismail Hospital, Johor Bharu and resulted in the hospital being closed for 17 months to repair the situation and in 2008, this problem was diagnosed even though not seriously. This is particularly alarming to some in our country as the level of internal air quality control and the implementation of occupational safety and health are still low.

The deterioration of indoor air quality is a major concern for the business building, school, building managers, tenants and workers as it can affect the health, comfort, well-being and productivity of building residents (OSHA 2011). Additionally, occupational safety and health management also recognizes the deteriorating internal air quality can have harmful effects on the health of workers.
According to Ongwandee et al. (2011), if net air intake is reduced in an internal environment it can cause indoor air quality to deteriorate due to increased pollutant emissions and thereby negatively impact people inside the building. In addition, the failure of owners and building operators in responding promptly to resolving internal air quality problems can effectively lead to some health effects to building residents. Air movement from outdoor environments that enters the indoor environment can also cause indoor air quality deterioration and at the same time cause changes in the physical environment factors of the indoor environment that induce an increase in existing internal pollutants (USEPA 2010).

In order to create a sustainable work environment in the context of governance in occupational safety and health in the aspect of indoor air quality there are two methods that are used is through legal and non-legislation. Implementation of legislation and non-legislation is one of the most important methods in managing a good, efficient environment and also addressing environmental pollution problems that can disturb the environment and human habitat (Muhammad Rizal Razman et al. 2009) Environmental management through legal methods comprises private law and public law and environmental management through non-legislation consisting of guidelines, codes of practice, permissions, planning, public policy, education, research and development (Jamaluddin et al. 2001).

**Sustainability Governance**

Sustainability governance defines critical interaction at various levels either locally, nationally and globally in formal or informal interactions in enacting and implementing policies in response to environmental and input from the public to achieve development sustainable environment (Muhammad Rizal Razman et al. 2009). Sustainable governance shows how changes in understanding environmental issues have led to the movement of local opinion to recognize larger and more complex scale. This move leads to an increase in the diversity, specificity and complexity of the initiative (Meadowcroft 2002). Innovation is being done on layered structures as well as on existing processes, rather than replacing existing stakeholder stakeholders (Meadowcroft 2002). Furthermore, through a comprehensive approach and the involvement of various institutions in addressing environmental issues that can be undertaken on both scales whether smaller or larger (Lefferty & Meadowcroft 2000).

When discussing occupational safety and health management in terms of indoor air quality involves the involvement of various stakeholders. These stakeholders are structured organizations that have hierarchical processes and their own streams and perceptions from stakeholders involved and comprise several levels and institutions namely the government, statutory bodies of the industry sector, society, individuals and non-governmental organizations (NGO). Participation and participation of this diversity show important interactions in the decision-making process and also have the power to change the relationship structure as well as the approaches implemented in occupational safety and health management by the government through more strategic and dynamic management based on established objectives (Pearce & Robinson 1991). This is known as sustainability governance which is a multidisciplinary and transdisciplinary discipline (Komiyama & Takeuchi 2006).
Holistic Approach

A holistic approach refers to an approach in understanding a management through a structured organizational structure with the involvement of various stakeholders in the management of occupational safety and health in terms of indoor air quality. The organizational structure formed in occupational safety and health management is a hierarchical process and has a distinctive perspective as there is a diversity of institutional participation which together in achieving the same objectives in providing a sustainable work environment based on one common objective (Pearce & Robinson 1991).

In order to achieve harmony among the participating institutions, leadership skills, feedback and management of internal systems are critical in evaluating internal strengths and weaknesses in the involvement of institutions and subsequently taking corrective actions to create harmony (Freedman 1995). Awareness in keeping and meeting the needs of the institutions is an important focus on the government. This is because each institution has its own specific targets and interests that need to be taken care of, especially the industry and society such as employers in calculating profits in every activity carried out and at the same time ensuring the safety and health of the workers are maintained.

At the same time, this approach also encompasses the implementation of legislation and systems relating to occupational safety and health in the aspect of internal air quality resulting from the concerns of high-level stakeholders namely the government who is responsible in regulating the law and establishing a security management system and occupational health that require the involvement of various stakeholders.

Reductionism Approach

The approach to reductionism focuses on the fundamental principles of science in describing the work environment or finding causes that lead to the deterioration of indoor air quality in occupational safety and health management. According to studies, most individuals spend almost 80-90% of the building including workers (Herberger et al. 2010), so the working environment is an important factor in ensuring the safety, health and productivity of employees are always in good shape.

Productivity of an employee depends on the health aspect as well as the healthy work space environment. This is because a good working space has a scientific connection with indoor temperature, relative humidity, ventilation rate and also the presence of internal pollutants (OSHA 2011). Examples of indoor air pollutants are physical, biological, chemical and stress hazards (Murray & Lopez 1997). Relatively high temperatures and humidity can affect not only the sharpness of the mentality and disturb the feeling of subjective work but also contribute to the increase in internal air pollutants that can cause health problems amongst employees (Burroughs 2004).

In addition, this approach concerns the aspects of knowledge and experience gained by stakeholders in the management of occupational safety and health in terms of indoor air quality. Aspects of knowledge are the expertise found in an organizational body while the experience aspect is based on the last study to find out the easy relationship and response in addressing the problem, focus and needs of an organization in creating a sustainable working environment (Scott & Hughes 1995).
The enforcement aspect is an act imposed on stakeholders who are found guilty of violating the legislation (Muhammad Rizal Razman 2009; Abdul Aziz Hussin 1998), especially legislation relating to occupational safety and health. The amount of penalties and types of penalties is different for offenders in accordance with the hierarchical structure in the management of occupational safety and health as provided in the statutory law (Muhammad Rizal Razman 2009; Koh et al. 1989).

Method

The early stages of this study involved the collection of basic information and secondary data that have been published. It is important in responding to a research problem that is whether the successful management of a sustainable work environment based on legislative and non-legislative safety and occupational health in the aspect of indoor air quality is influenced by one or the combination of holistic and reductionism approaches. Next is the data collection section. The selected documents are occupational safety and health studies related to indoor air quality and there are also documents that are procedures performed by a party to address internal air quality problems in the work environment. All selected documents can illustrate how the implementation of legislative and non-legislative occupational safety and health in addressing the problem of indoor air quality deterioration.

The main documents in this study are:

1. Industry Code Of Practice on Indoor Air Quality (ICOP IAQ) 2010
2. Occupational Safety and Health Act 1994 (Act 514)
3. Factories and Machinery Act 1967 (Act 139)
4. Occupational Safety and Health Management System (OSHMS)

Data Analysis

The above mentioned documents were analyzed using Nvivo version 11 software. By using the software, researchers have built and tested coding schemes. This action should be evaluated for the reliability of the lecturers who are specialized in qualitative research at Universiti Kebangsaan Malaysia (UKM). The analysis of this theme is based on the reliability index of Cohen Kappa (Cohen 1960).

Result

The entire analysis of this document contains 7 themes and 23 sub themes to illustrate the factors that influence the successful management of a sustainable working environment. The overall theme and sub theme illustrate the approaches that influence the success of sustainable work management through document analysis as shown in Figure 1.
Table 1 Overall Theme and Sub Theme in Document Analyse

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOLISTIC APPROACH</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>Authorities, Industries, Society</td>
</tr>
<tr>
<td>Management</td>
<td>Legal, Small legislation</td>
</tr>
<tr>
<td>System</td>
<td>Mechanical Ventilation and Air Conditioning System, Occupational Safety and Health Management Systems,</td>
</tr>
<tr>
<td>REDUKTIONISME APPROACH</td>
<td></td>
</tr>
<tr>
<td>Mechanistic</td>
<td>Work environment</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Employers, Employees, Designers, Manufactures, Suppliers</td>
</tr>
<tr>
<td>Experience</td>
<td>Employers, Employees, Designers, Manufactures, Suppliers</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Investigation, Compound, Prosecution, Appeals, Court</td>
</tr>
</tbody>
</table>

Source: Document analyse 2016

In the analysis of documents made on four documents comprising legislation and non-legislation, it was found that a total of 1081 paragraphs (para) illustrated the overall approaches studied. The most are those who describe a holistic approach of 546 people. For the approach of reductionism shows 535 para.

i. Dependency in Holistic Approach

Document analysis found that there was a dependence on the holistic approach as shown in Table 2. A total of 24 para in the theme of the community found that there was a dependency on the management theme and 28 for the theme of the system. For management themes, reliance on the theme of community is as many as 35 para and 1 para for system theme. While for the theme of the system there are 31 dependencies with community themes and 1 for management theme.

Table 2. The frequency of the paragraph passages (para) shows dependence in a holistic approach through document analysis

<table>
<thead>
<tr>
<th>Holistic Approach</th>
<th>Community</th>
<th>Management</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>-</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Management</td>
<td>35</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>System</td>
<td>31</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Document analyse 2016
ii. **Dependency in Reductionism Approach**

Documents analysis found that there was dependence on the reductionism approach as shown in Table 3. A total of 27 para in the mechanistic theme found the reliance on the theme of knowledge, 7 elements for experience themes and 9 for enforcement themes. For the theme of knowledge there are 20 dependents with a mechanistic theme, 10 para themes of experience. While for the theme of experience there are 40 dependents with a mechanistic theme, 35 with the theme of knowledge and 29 with the theme of enforcement. Finally, as one of the dependencies with a mechanistic theme, 4 with the theme of knowledge, 4 with the theme of experience.

<table>
<thead>
<tr>
<th>Reductionism Approach</th>
<th>Mechanistic</th>
<th>Knowledge</th>
<th>Experience</th>
<th>Enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanistic</td>
<td>-</td>
<td>27</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Knowledge</td>
<td>20</td>
<td>-</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Experience</td>
<td>40</td>
<td>35</td>
<td>-</td>
<td>29</td>
</tr>
<tr>
<td>Enforcement</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Document analyse 2016

**Discussion**

**Holistic approach**

Based on the findings from document analysis on holistic approaches, this approach consists of 3 themes with 7 sub themes. The main theme of a holistic approach is community, management and systems. While the theme covers the government, industries, society, legislation, small legislation, the Mechanical Ventilation and Air Conditioning System (MVAC) and the Occupational Safety and Health Management System (OSHMS). All themes and sub themes for holistic approaches as in Table 1.

Based on the results of the document analysis found that the factors that most affected the governance in occupational safety and health in terms of indoor air quality were community factors ranging from involvement of stakeholders. The government as a leader and catalyst in legislative and non-legislative implementation governance in occupational safety and health in terms of indoor air quality. Based on the documentary evaluation findings only involve the involvement of government, industry and society. This indicates that the government, Department of Occupational Safety and Health (DOSH), is a stakeholder with a stable power in influencing other stakeholder (industry and society) as well as regulating occupational safety and health legislation in order to create a sustainable environmental management environment.

In addition, although the frequency of the number of dependent management themes with system themes based on the results of document analysis and interviews is low but in the implementation of a system, especially OSHMS by an organization is guided by two major legislations namely the Occupational Safety and Health Act 1994 and the Act Factories and Machinery 1967. Hence, the frequency of low numbers does not indicate that management themes with system themes are not important in governance in occupational safety and health.
in the aspect of indoor air quality but it also indicates that the implementation of Occupational Safety and Health OSHMS must be based on legislation and must be adhered to by organizations in Malaysia.

While OSHMS does not have the specificity in the indoor air quality aspect but this system requires the most important legal requirement of Section 15 AKKP 1994, whereby each employer has provided a safe and healthy working environment to its employees depending on the type of activity, process and service provided by the organization. This suggests that the deterioration of indoor air quality in the work environment is also an element that the employer has to pay attention to its employees in implementing this OSHMS.

The MVAC is a major system of attention in ICOP IAQ 2010 in determining the indoor air quality of a closed building. On the contrary, the involvement of various stakeholders has their respective roles either in the implementation of legislation as well as systems related to occupational safety and health in ensuring a sustainable work environment.

Reductionism Approach

In establishing a safe and healthy working environment, the control of measurement of physical, chemical and biological parameters in a building must be monitored if the occupants of the building start showing the experienced in Sick Building Syndrome (SBS) will start to have health and comfort in the building. This is a good working environment can be determined by ensuring that these three parameters are at a good level as recommended by the DOSH and safe and healthy working environment and can increase employee productivity within an organization. This can be explained through the mechanistic factors.

The knowledge factor of each stakeholder involved in the implementation of governance in occupational safety and health in ensuring a sustainable working environment is an important factor. This is due to the fact that DOSH's superior knowledge in conducting research, awareness programs, seminars, modules, standards-related standards of occupational safety and health is a reference material for industry, employers and employees. Knowledge from industry comprising manufacturers, suppliers and designers in preparing and designing materials and plants can also assist employers. While employers' knowledge through activities, processes and services carried out in a job can help employers to provide preventive measures and control measures to their employees, especially to meet the legal requirements and OSHMS.

At the same time, the knowledge factor from the employer can also assist the National Institute Occupational Safety and Health (NIOSH) in providing employees and technology training appropriate to the organization's activities, processes, and services. Additionally, workers who have the knowledge and awareness of the effects of the awareness program provided will help the employees be more cautious during their work activities.

Furthermore, factors such as the experience of stakeholder diversity are the highest frequencies of both the analysis of documents. This clearly demonstrates that many factors influence the performance of governance in occupational safety and health governance in the aspect of indoor air quality. Based on the experiences factors of a stakeholder can make improvements especially meet the requirements of documents in the implementation of OSHMS.

Awareness levels for employers and employees can also be enhanced based on these experience factors such as the incidence of illnesses faced by workers impacting on the issue of indoor air quality decline as well as the culture brought about by employees who are not
concerned about the safety and health of themselves as well as the workers who others. On behalf of the government, the outcome of an investigation into internal air quality deterioration in Malaysia has provided an overview and appropriate control measures in resolving new cases.

Conclusion

Based on the assessments made by the analysis of the document on the strength of factors affecting the success of sustainable environmental governance, both approaches play a key role.

The main factor is the strength of the community which consists of various stakeholders under the government under the DOSH, the Human Resources Ministry assisted by the NIOSH. The influence of power based on the power of authority from these superiors (Edward 1979; Salaman 1979 and Junaidi 2004) can define strategic directions that define objectives in key plans in creating a sustainable work environment.

Subsequently, the assessment made shows that every factor in both approaches has its own strengths and interdependencies which are supported by the strength of the affected community as described above. Organizational innovations and cultures need to be implemented on the existing stakeholder structures instead of supplying stakeholders in achieving its objectives (Meadowcroft 2002) to ensure a sustainable work environment based on the basic principles of sustainability governance.

Finally, the results of this study also found that the beginning of the idea in an effort to create a sustainable working environment is based on scientific information adapted by standards from abroad and adapted and subsequently developed as a reference in Malaysia. This idea is a trigger for the implementation of occupational safety and health governance in terms of indoor air quality.

However, the idea of this trigger has changed to the operational vision of which occupational safety and health governance in the aspect of indoor air quality is influenced by factors that depend on both holistic and reductionism approaches. The findings of this study show that these operating ideas are influenced by political ideas and ideas of triggers based on the idea of scientific information.

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