

CHAPTER 7

AN EVALUATION OF GREEN ENVIRONMENTAL PLANNING IN SELECTED APPAREL INDUSTRY IN SRI LANKA

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Introduction

With the globalization we are getting rid of inspiring natural environment the minute by minute. All the people are entangled with machines rather than enjoying with the simple life which closes to the nature as past. As a result of that the global warming is also being increased with so many bad effects for the living and non-living things. This situation causes having many unbalances in physical and human environment. So it is essential to manage the gap between natural resource consumptions and the human needs with sustainable approach.

Therefore it is essential to connect with the sustainable solutions for the betterment of the natural and physical environment. Organizations are highly aligned with different kinds of environmental planning nowadays. “Green Environmental Planning” is one of them and it is used for the betterment of the organizations in many ways. This concept is being developed in the world since many years with different aspects (Green Building Council, 2009). Such as; Green building or construction, Internal green environment planning, Green architecture and roof, Green living and economy, Green landscape etc.

Green Environmental Planning is all about behaving, engaging, and connecting all the building arrangements with eco-friendly manner to inspire the natural environment as well as to combine with the sustainable environment. This is to have a better future without any harmful feedback from the natural environment. It involves finding the balance between home buildings and the sustainable environment. In practice, going green means adopting several basic principles in your daily life as, reduce pollution, conserve resources, conserve energy, reduce consumption and waste, and protect the earth’s ecological balance (US Environmental Protection Agency, 2009).

All above principles are important in protecting the environment from harm, as well as helping to ensure that living (for humans and other creatures) on earth is sustainable (US Environmental Protection Agency, 2009).

A lot of organizations are highly aligned with the Green Environmental Planning now because they can have so many benefits and profits from it. The ultimate aim of all organizations is to achieve high productivity with better image through environmental sustainability. So the green concept always contributes to have a good organizational productivity with managing environmental sustainability in many ways. This study deals with the evaluation of green environmental planning in one selected apparel company in Sri Lanka.

Literature Review

With the industrialization people are entangled with machines rather than enjoying their simple life as past. Therefore the human needs are becoming higher than the exciting resources. So this sustainable development concept aligns with using resources by saving some for future (UN World Commission of Environment and Development, 1987). The report of Our common future also emphasized the requirement of sustainable development in 1987 as this is a universal accepted criteria for protecting environment.

According to the United Nations Environmental Program in 1991, the quality of human life should be improved by protecting the sustainable interrelationship between human and nature. Three main principles are there in sustainable development according to Bombugala and Atputharajah (2010). Such as, Equitable, Bearable and Viable (Figure 1).

Figure 1: Components of Sustainable Development
(Source: Bombugala and Atputharajah, 2010)

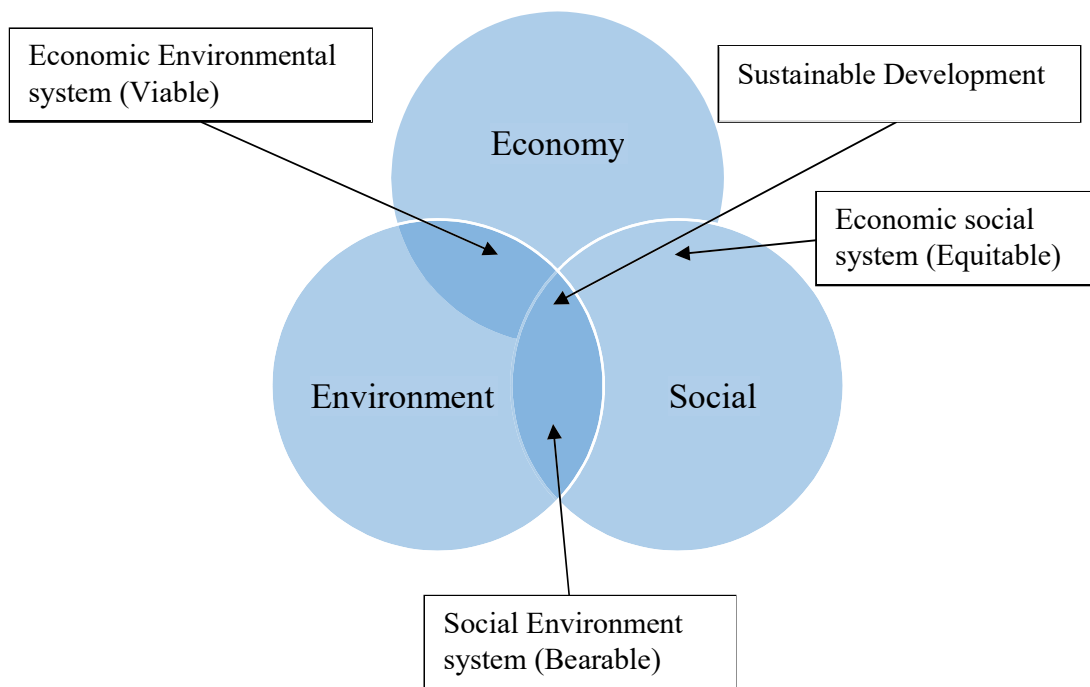


Figure 1 shows that how the real integration can be improved among social, environmental and economic fields. Green Environmental Planning is utilized recently for organizational arrangements and numerous organizations have involved with this sustainable products up to 20th century. Green industrial zones, Green belts and Green parks are also prominent arrangements of Green Planning today in many industrial zones around the world.

Green environmental planning deals with the eco-friendly working methods with the intention of protecting natural environment and having sustainable benefits for organizations through renewable energy sources, eco-friendly work arrangements, garbage management, pure natural ventilation etc as well (Green Building Council, 2009).

There are several components can be identified in the Green Environmental Planning (Figure 2). These components play a vital role when designing a green environment (Bombugala and Atputharajah, 2010).

Figure 2: Components of green building designing
Source: (Bombugala and Atputharajah, 2010)



All components of Green Environmental Planning are aligned with different kinds of concepts. The most important concept is Sustainable development concept. This concept has been improved after developing the report of “World Conservation Strategy” and this is one of the most complex factors under concepts of Green Planning. According to this concept there should be included three main important factors for any development process. Such as;

- Maintaining Environmental Processes
- Sustainable usage of all resources
- Maintaining genetic diversifications (Dhanapala, 2010)

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Impact of Green Environmental Planning on Different Fields

Importance of Green Environmental Planning is being increased with the rise up of global warming today. It affects not only for the natural environment but also for the economic and social environment too. Table 1 shows the benefits of sustainable design in terms of economic, societal and environmental under each principle.

Green Environmental Planning in Sri Lanka

In Sri Lankan apparel sector some well-known companies have taken the initiate step to engage manufacturing process in sustainable way through building Green Factories with the intention of having environmental certifications like LEED as a part of ethical trading. The very first green factories are owned by the massive garment producers in Sri Lanka namely, MAS holdings Thuruli factory Thulhiriya, Brandix Casual Wear, Seeduwa, Hirdaramani Mihila factory, Agalawatththa (Thilakarathna and Silva, 2013).

Table 1: Benefits of Sustainable Design

| Key principles | Economic | Societal | Environmental |
|--------------------------------|--|--|--|
| Sustainable Sites | <p>Reduced costs for site preparation, parking lots and roads</p> <p>Lower energy costs due to optimal orientation</p> <p>Less landscape maintenance cost</p> | <p>Improved aesthetics (e.g., better appearance of site to neighbors)</p> <p>Increased transportation options for employees</p> | <p>Land preservation</p> <p>Lower resource use</p> <p>Protection of ecological resources</p> <p>Soil and water conservation</p> <p>Reduced energy use and air pollution</p> |
| Water Efficiency | <p>Lower first costs</p> <p>Reduced annual water costs and wastewater costs</p> | <p>Preservation of water resources for future generations and for recreational and agricultural uses.</p> <p>Fewer waste water treatment plants</p> | <p>Lower potable water use and pollution discharges to waterways</p> <p>Less strain on aquatic ecosystems in water-scarce areas</p> <p>Preservation of water resources for wildlife and agriculture</p> |
| Energy Efficiency | <p>Lower first costs, when systems can be downsized due to integrated energy solutions</p> <p>Lower annual fuel and electricity costs due to the reduced peak power demand</p> <p>Reduced demand for new energy infrastructure, lowering energy costs to consumers</p> | <p>Improved thermal conditions; better occupant comfort satisfaction</p> <p>Fewer new power plants and transmission lines</p> | <p>Lower electricity and fossil fuel use</p> <p>Less air pollution and carbon dioxide emissions</p> <p>Decreased impact of fossil fuel production and distribution</p> |
| Materials and Resources | <p>Decreased first costs due to material re-use and use of recycled materials</p> <p>Lower costs for waste disposal</p> <p>Decreased replacement cost for more durable materials</p> <p>Lower costs for new landfills</p> | <p>Fewer landfills and associated nuisances</p> <p>Expanded market for environmentally preferable products</p> <p>Decreased traffic due to use of local/regional materials</p> | <p>Reduced strain on landfills.</p> <p>Reduced virgin resource use</p> <p>Healthier forests due to better management</p> <p>Lower energy use for material transportation</p> <p>Lower energy and pollution</p> <p>Increase in local recycling market</p> |

Source: (Waidyasekara, 2013).

Examples for Effective Green Practices in Sri Lanka

There are several accepted measurements to measure these factors in the world and the effectiveness can be identified through it. Here are some examples for the effective practices of Green Environmental Planning in Sri Lanka (Bombugala and Atputharajah, 2010).

- The MAS intimates Thuruli factory, Thulhiriya: Energy cost reduce by 40% and 95% waste recycling.
- HNB Nittambuwa: Reduce energy cost by 30% and 56% reduction in portable water.
- CKT Apparel, Mihila: Reduce energy consumption by 48% and reduce 60% total water by harvesting of rain water.
- Brandix Casual Wear Ltd, Seeduwa: Energy cost reduction by 50%, 60% reduction in water consumption, 95% waste recycling and reduced absenteeism with improvement health standard to 2%.

In accordance with the literature review there can see many effective practices regarding the Green Environmental Planning in different fields in Sri Lanka. Majority of literature express the success and less attention has given for expressing ineffective green practices. So this study was aligned with the effective as well as ineffective Green Environmental Planning in a selected apparel industry in Sri Lanka.

Research Problem

There are some special symptoms for doing the research regarding the Green Environmental Planning in the selected apparel industry.

- The factory goes with Green Environmental Planning for particular factory rather than applying it for their all branches even it is essential for today's globalization.
- According to the location and the geomorphic systems in the area it can be more improved than existing arrangements. They have not utilized the environmental geographical knowledge in proper way.
- The existing Green Environmental Planning has not affected to reduce stress of employees in a proper manner.
- Green Environmental Planning is not up to the standard level compared to the other reputed organizations in the world regarding the usage of Green Environmental Planning due to technological poorness (As a developing country).
- The supportiveness of employees and the attitudes of employees are not enough for the success of green environmental planning.
- Less government contribution for Green Environmental Planning.

According to the above symptoms it is clear that the research problem deals with how much the factory has used Green Environmental Planning effectively and how much they achieved for their success through it. In another way it can be emphasized as "whether the Green Environmental Planning which used inside the factory is effective or not".

According to the above problem identification, an appropriate research questions to be asked from the organization are;

- How about the nature of Existing Green Environmental Planning?
- Whether the existing Green Environmental Planning is effective or not?
- Why it is ineffective?
- What are the problems and issues of its planning?
- How to make it more effective?

Objectives of the research

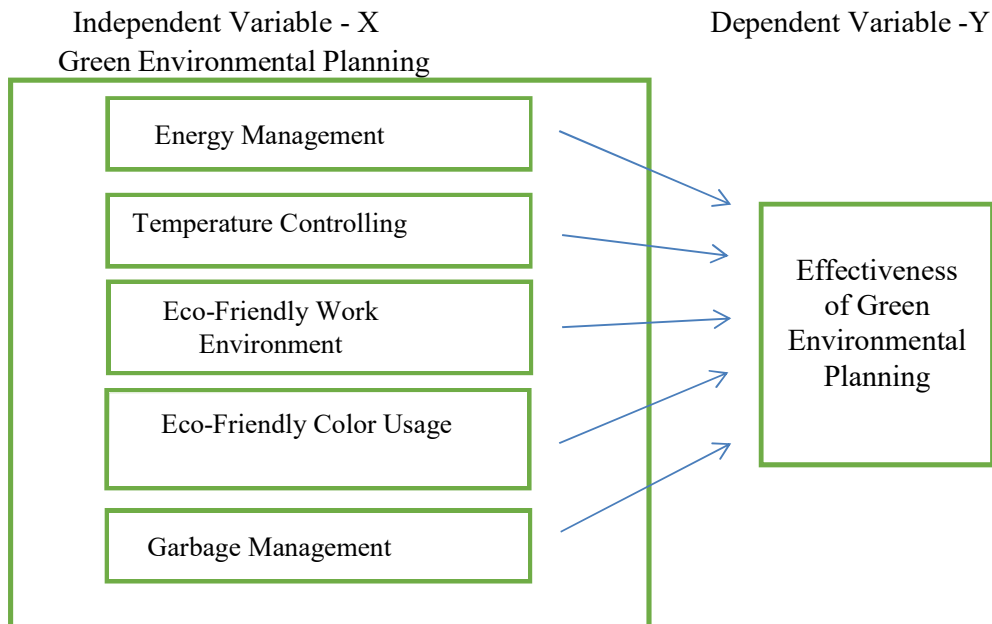
General objective of the study was to evaluate the effectiveness of Green Environmental Planning and to suggest the ways and means of making Green Environmental Planning more effective. There are several specific objectives of the study and those can be listed as follows;

- To study the nature of existing Green Environmental Planning in Brandix.
- To study whether the existing Green Environmental Planning is effective or not.
- To find why the Green Environmental Planning is ineffective.
- To identify problems and issues of its planning.

Methodology

The entire study of the research is conducted through deductive (Quantitative) research approach with; problem identification and formulate the research problem, Conceptualization and hypothesis, Operationalization and design, Data collection and analysis, and findings and conclusions. The conceptual model of this research study consisted of five independent variables and one dependent variable (Figure 3). The dependent variable is effectiveness of the Green Environmental Planning.

Figure 3: Conceptual Framework



Source: Author Developed (2015)

Following are the statements of hypotheses the researcher has tested with the help of empirical findings.

- H1** - There is a relationship between Energy management and Effectiveness of Green Environmental Planning.
- H0** - There is no relationship between Energy management and Effectiveness of Green Environmental Planning.
- H1** - There is a relationship between Temperature Controlling and Effectiveness of Green Environmental Planning.
- H0** - There is no relationship between Temperature Controlling and Effectiveness of Green Environmental Planning.
- H1** - There is a relationship between Eco-Friendly Work Environment and Effectiveness of Green Environmental Planning.
- H0** - There is no relationship between Eco-Friendly Work Environment and Effectiveness of Green Environmental Planning.
- H1** - There is a relationship between Eco-Friendly Color Usage and Effectiveness of Green Environmental Planning.
- H0** - There is no relationship between Eco-Friendly Color Usage and Effectiveness of Green Environmental Planning.
- H1** - There is a relationship between Garbage Management and Effectiveness of Green Environmental Planning.
- H0** - There is no relationship between Garbage Management and Effectiveness of Green Environmental Planning.

Some of the important data were collected through various secondary data sources like Journal articles, Books, News Papers, and Magazines which consist of related literature on Green Environmental Planning. It paves the way for finding the empirical gap with better understanding and conceptualizing to the study. After careful consideration of the secondary data the primary data was collected via a structured questionnaire.

The population for the study comprises all employees who work under the inspiration of Green Environment Planning according to the company's annual reports. The population consists of 140 workers. The sample identified for this study was 60 employees. Here, the "simple random sampling" was applied as the sampling method. All the items and the members are given same probability without any biases.

Result and Discussion

The reliabilities are fallen in to two categories such as good and moderate categories in accordance with Cronbach's Alpha value. It means all the questions of the questionnaire in this study are powerful enough to measure the relationship between independent and the dependent variables.

Table 2: Reliability Summary

| Variable | Reliability |
|---|--------------------|
| Effectiveness of Green Environmental Planning | 0.863 |
| Energy Management | 0.744 |
| Temperature Controlling | 0.612 |
| Eco Friendly Work Environment | 0.686 |
| Garbage Management | 0.771 |
| Eco Friendly Color Usage | 0.726 |

Source: Survey Data (2015)

Identifying about the present Green Environmental Planning was one of the objectives in this study. Five questions were there in the questionnaire for identifying deferent kinds of opinions of selected respondents regarding the present Green Environmental Planning. Grand Mean of the analysis was 3.16. The average of weighted values is 3.0 according to the categorization of questionnaire. Therefore the Grand Mean falls in-between Neutral and Agree category. So it can be emphasized that the general idea of the existing Green Environmental Planning is in moderate manner.

Correlation analysis (Table 3) shows the relationship between green environmental planning and the effectiveness of green environmental planning.

Table 3: Pearson Correlation Summary

| Variable | Pearson Correlation |
|---|-----------------------------|
| Eco Friendly Color Usage and Effectiveness | 0.163 with p-value of 0.000 |
| Energy Management and Effectiveness | 0.221 with p-value of 0.063 |
| Temperature Controlling and Effectiveness | 0.341 with p-value of 0.003 |
| Eco Friendly Work Environment and Effectiveness | 0.352 with p-value of 0.003 |
| Garbage Management and Effectiveness | 0.175 with p-value of 0.000 |

Source: Survey Data (2015)

Table 4: Relationship Summary

| Variable | Tested Hypothesis | Relationship |
|---|------------------------------|----------------------------|
| Eco Friendly Color Usage and Effectiveness | H0 – rejected H1 - accepted. | Week Positive Relationship |
| Energy Management and Effectiveness | H0 – accepted H1 - rejected | No Relationship |
| Temperature Controlling and Effectiveness | H0 – rejected H1 - accepted. | Week Positive Relationship |
| Eco Friendly Work Environment and Effectiveness | H0 – rejected H1 - accepted. | Week Positive Relationship |
| Garbage Management and Effectiveness | H0 – rejected H1 - accepted. | Week Positive Relationship |

Source: Survey Data (2015)

Conclusion

It was observed that the Green Environmental Planning has less impact on Effectiveness of Green Environmental Planning in the selected factory. Temperature Controlling, Garbage Management, Eco Friendly Work Environment, Eco-Friendly Color Usage show week positive relationship with the effectiveness of Green Environmental Planning. It means the Effectiveness is being increased up to small extent when the Green Environmental Planning is arranged inside the factory. It was identified that there is no relationship between Energy Management and Effectiveness of Green Environmental Planning.

In accordance with the findings the author has recommended some strategies for the organizations to improve effectiveness through standard Green Environmental Planning. Further this study would be beneficial for the top management, employees, HR managers, same industries, other industries and finally for the Sri Lankan economy and globalization as a whole.

Managing Energy

- Improve good insulation in the roof and walls helps keeping the inside temperature cool during hot season to make comfortable working environment for all employees.
- Appropriate roof overhangs for letting in the cool weather but shade from the hot summer sun in a proper manner to make healthy environment for all employees.
- Make sensible fenestration (windows) let in the light to make bright working environment.
- Natural lighting through windows and light wells can be made up to the standard level according to the organizations who involves with Green Planning in developed countries.
- Improve usages of Sri Lankan geographical knowledge regarding the climate through brilliant geographers as well as geologist to make pleasant surroundings for increase the effective Green Planning in Brandix.

Managing Temperature

- Use the natural ventilation in a scientific way. Such as, using zenithal or lateral windows which help to optimize the fresh air usage.
- Using thermic screens and shading net system which will help to light radiation control, save energy, humidity alteration and to reduce temperature.
- Using a forced ventilation system. Such as, using electrical fans to reduce humidity and for a better heat distribution.
- Using a FOG system, which is a local humidification system produces artificial fog and cools down the area.
- Using a proper air circulation and humidity control
- Using HID (High-intensity discharge) lamps which offer the highest quality output of available grow-light options.
- Using Mechanical thermostats to control the heat. It exists with sensitive liquid which expands automatically when increasing the temperature and activates a switch that turns the fans on.

Managing Eco Friendly Work Environment

- Design smoke free buildings to avoid respiring air from smoking areas and does not get distributed to other areas of the building through doors or vestibules, operable windows.
- Improve employee health and comfort as well as performance by providing them with individual space or zone control of heat, ventilation, cooling, day-lighting with natural resources.
- Take actions to reduce the creation and spreading of construction dust and dirt.
- Establish the working hygiene by policies and practices which will help to improve eco-friendly work surrounding.
- Putting the notice about great sayings regarding the importance of natural environment protections.
- Arranging more green mid yards with appropriate plants for absorbing CO₂.
- Use high quality ergonomic systems to make surrounding neater and tidier.

Managing Eco Friendly Color Usage.

- Utilization of Eco-Friendly colors is also crucial here. Improving 'Green color' concept to arrange the work environment with an eye to make more pleasant and refresh environment is the most effective factor here.
- Use earth color and white color arrangements in standard manner according to the other organizations who achieved the success of the Green Planning in the world.
- Improving tree planning and gardening which will make the environment greener.
- Use more and more eco-friendly colors for making factory wears and equipment.

Garbage Management

- Use the 3R concept of reduce, recycle and reuse for a better waste management.
- Find new methods to reduce the amount of materials used and reduce the amount of waste generated by constructing waste reduction plans. Implement waste recycling programs and supply separate, clearly labeled dumpsters for each recycled material.
- Train employees on the policy and enforce compliance with an eye to make pleasant and clean surrounding for all.
- Create cleaner surrounding without any polluted areas to make the working environment more attractive and fresh. Appropriate disposal bins can be placed in appropriate places at the work place to avoid unnecessary pollutions. These things should be in a standard level compared to the other countries.
- Use separated bins to put crumbling and non-crumbling disposals in the work place to enhance neat and tidy. There should be a proper awareness programs regarding this because it is clear that

they do not have proper understanding about this.

- Keep surrounding environment cleaner to have pure ventilation and mental relaxation through standard levels.

The most significant part of the organization is employees and therefore it is important to identify about their suggestions regarding the ‘Green Environmental Planning and its Effectiveness as well. Employees have mentioned that;

- Pure ventilation should be spread all over the building rather than limited to several areas. It helps having natural ventilation and it helps relaxing employees’ mind as well as reducing electricity of the organization.
- There should be more and more green plants inside the organization as it makes pleasant surroundings. It was revealed that there are several plants have grown inside the work place. But employees are not satisfied with these arrangements because they feel that it is not enough for absorb excess carbon dioxide from inside machineries.
- There should be an awareness programs, workshops and exhibitions regarding the green environmental planning.
- It is better to listen to some “mind relaxation” music while working in the organization because it helps relaxing minds with spiritual happiness.

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