Analysis of Carbon Footprint in Terms of Electricity Consumption Practices in Primary Schools: A Case Study of Batang Padang District, Perak, Malaysia

Hanifah Mahat, Mohmadisa Hashim, Yazid Saleh, Nasir Nayan, Saiyidatina Balkhis Norkhaidi

Department of Geography & Environment, Faculty of Human Sciences, Sultan Idris Education University, 35900 Tanjong Malim, Perak, Malaysia
Email: hanifah.mahat@fsk.upsi.edu.my

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Abstract

Energy resource consumption, and particularly consumption of electrical energy, influences the increase of greenhouse gas – that is, carbon dioxide in the atmosphere – which results in global warming. One of the strategies to overcome this issue is to implement energy saving sustainability practices. Thus, the purpose of this article is to identify the level of carbon foot print from electricity consumption as well as the relationship and effects of sustainability knowledge, green knowledge, and sustainability practices towards electricity consumption (carbon footprint analysis) in primary schools. This study involved 423 students from ten primary schools within the district of Batang Padang, Perak, Malaysia. A cluster sampling method was used during the first stage of selecting the schools and groups of students. Then, the respondents were chosen by a simple random method from among students between the ages of 10 to 12 years old who were able to read. Results show that the carbon footprint emissions in the studied school areas are still at a low level. The relationship analysis shows a weak significant correlation between (i) sustainability practices and sustainability knowledge, (ii) sustainability practices and carbon footprint, and (iii) green environment and carbon footprint analysis. Similarly, the study shows a moderate relationship between 3R practice variables and carbon footprint analysis in schools. Regression analysis shows that sustainability practices contribute to carbon footprint when compared with sustainability knowledge and green environment. Thus, this shows that sustainability knowledge has a direct relationship with sustainability practices and electricity consumption. The results clearly prove that primary school students show positive elements of sustainability practices. These findings can help schools to identify weak variables, such as green practices knowledge, that need to be improved in order to reduce carbon emissions in schools.

Key words: sustainability knowledge, sustainability practices, green knowledge, carbon footprint analysis, student, primary school

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Introduction

The current industrial community that was formed hundreds of years ago is now facing various problems which involve society, the environment, and the economy. A more significant problem involves ecological degradation with regard to incidents and issues of global warming, unpredictable climate change, and solid waste pollution (Shaharudin, 2012). It is true that global demand requires development within countries, but every development and technology developed can negatively affect the environment; for instance, the decrease in landuse area and the emission of polluted gases into the atmosphere, such as carbon monoxide and carbon dioxide (Walser, Demou, Lang, & Hellweg, 2011).

As a developing country, Malaysia also faces a big challenge in ensuring sustainable development. The air quality of urban areas, river quality, and destruction of forest areas, domestic waste, and hazardous waste are several examples of environmental issues faced in Malaysia. In fact, looking at air pollution alone, it has been shown that between 2010 and 2014 the emission of pollutants to the atmosphere from power plants and motor vehicles increased by 20 percent and 14.3 percent, respectively (Department of Statistics, 2015). This means that the air quality status which was reported in the air pollution index (AQI) based on the concentration of five main pollutants – namely the ozone on the surface of the earth (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulphur dioxide (SO2) and fine particles with a size of less than 10 microns (PM10) – were not only contributed to by open-air burning, but also by power plants, motor vehicles, and industrial activities (Department of Environment, 2014).

In order to address this problem, awareness programmes on energy saving sustainability practices, the use of energy efficient appliances, and sustainability practices have been included in the Education for Sustainable Development (ESD) guidelines in order to reduce the rate of indirect carbon emission to the atmosphere. ESD is a new directive that aims to develop all aspects of learning and to encourage a change in attitude for a sustainable community. At the same time, its purpose is to integrate the principles, goals, and values as well as the practices of sustainable development into all aspects of education in order to handle social, economic, cultural, and ecological issues of the 21st century and to encourage a change in attitude making possible better living worldwide (Salonen & Tast, 2013). In fact, the continuous and structured requirements of ESD programmes, such as the Sustainable School Programme carried out in Malaysia, have clearly proven to be effective in shaping an ESD attitude (Hanifah, Yazid, Mohmadisa, & Nasir, 2016; Hanifah, Shaharudin, Mohmadisa, Nasir, & Yazid, 2015).

Thus, direct exposure to holistic sustainability (economic, environmental, and social) through education is the best approach for improving sustainable development in an effort to promote positive environmental values (Ugulu, Sahin, & Baslar, 2013). Educational institutions such as schools have nowadays become the main channel of environmental education available to society, so that the knowledge, skills, positive values, and the right actions for handling environmental issues can be acquired (Hanifah, Shaharuddin, Mohamad Suhaily Yusri, & Noraziah, 2014; Hanifah, et al., 2015; Nurul Hidayah Liew, 2012). This educational approach can improve the knowledge and awareness of society about environmental issues for the next generation, as emphasised by the concept of sustainability development (Hanifah, Shaharuddin, Mohamad Suhaily Yusri, & Noraziah, 2014; Norizan, 2010).

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A study by Agut, Ull, and Minguet (2014) concludes that the concept of energy saving should be related to early childhood education in its entirety. This should start in the preparation of the curriculum, encompass teachers' readiness in terms of knowledge and training, and include the engagement of society members – especially parents – regarding early age education in order to change towards a sustainable development. Thus, this research studied the extent to which energy saving practices have been applied among students in schools. Two main focuses are discussed in this article: the level of energy saving sustainable practices and the level of carbon emissions, based on electricity consumption in schools.

Carbon Footprint and Energy Saving Practices

Carbon footprint measures of carbon dioxide (CO2) exclusively, which is emitted directly and indirectly, and caused by certain activities or accumulated over the lifespan of a product (Wiedmann & Minx, 2007). This includes activities of individuals, society, government, companies, organisations, processes, industrial sectors, and others involved in the provision of goods and services (Hammond, 2007). In addition, carbon footprint is the climate performance indicator which helps identify the main source of greenhouse gas (GHG) emissions and potential areas for improvement (Wu, 2011).

Forest Research Institute Malaysia [FRIM] (2012) stated that carbon footprint can caused from three ways which are direct emissions, indirect emissions (imports), and indirect emissions (export). Direct emissions can be measured through the smoke and fuel consumption from organisations' vehicles while indirect emissions (import) can be measured through purchasing utilities such as electrical appliances and for indirect emissions (export), carbon footprint can be measured by public transport used, such as trains, airplanes, and cab. The Life Cycle Assessment (LCA) has identified that the highest carbon footprint in the lifespan of a lighting product occurs over the period of its use from the consumption of electricity (Association of Water and Energy Research Malaysia [AWER], 2012). In the context of this study, carbon footprint was measured using indirect emissions, which is the electric power consumption of the studied area; i.e., the schools.

One strategy used to reduce carbon footprint emissions through electricity consumption, is by implementing energy saving sustainability practices in society. The purpose of the implementation of energy saving sustainability practices is to consume energy efficiently and to reduce unnecessary energy consumption that can cause loss to consumers (Hilal, 2011). Energy saving practices are achieved through an efficient use of energy, such as switching off the lights and electrical appliances when not in use and the use of sunlight rather than light during a bright day (Federation of Malaysian Consumers Associations [FOMCA], 2013). In addition, electricity saving is one of the green practices introduced in Malaysia by the Ministry of Energy, Green Technology, and Water (KeTTHA; 2015) followed by energy saving, environmental protection, and 3R (Reduce, Reuse, Recycle) practices which are related to one another. In fact, the National Policy on the Environment (DASN), which considers the combination of all three pillars (Figure 1), shows that DASN describes the importance of economic, social, and cultural progress towards sustainable development and the subsequentl ability to improve the quality of life of the community and national environment.

Figure 1: National Policy on the Environment
Source: Ministry of Energy, Green Technology, and Water, Malaysia (2002)

Studies on energy saving have been carried out on global, national, and various institutional levels. In Malaysia, a study was carried out by Tenaga Nasional Berhad (TNB) with 1300 members of the public to assess the consumers' level of knowledge about energy saving, focused on three issues: namely, knowledge, attitude, and action. The results show that energy saving was motivated by five aspects: saving money (the highest percentage at 43%), environmental issues (12%), awareness (17%), importance of energy saving (15%), and an increase in cost (13%; Kamariah, 2015). Similarly, a study conducted to collect public opinion by the Energy Saving Trust (Richard, 2016) found that younger consumers still did not fully understand their energy bills or the terms used to explain the amount of energy they consumed. Only seven percent of consumers aged below 35 stated that they fully understood their bills and almost 40 percent failed to identify that the electricity was measured in units called Kilowatts. However, 18 percent of the consumers aged below 55 stated that they fully understood their electricity bills, while almost one out of six adults (16 percent) did not know how to measure the energy. Thus, it can be concluded that consumers need to be exposed to the effects of carbon emissions with regard to electricity consumption and this must start at the school level.

For that reason, the basics of building knowledge, attitude, and values of sustainable development – particularly in the practice of energy saving – should be formed at an early age, because children are seen as individuals who are great at building their own identity and life (Samuelsson, 2011). This concern is based on previous studies carried out in Malaysia, one of which was by Mohd Zaid (2009) on 30 secondary school students in Kuala Terengganu, Terengganu, which finds that more than half of the students ignore the practice of electrical energy saving. Similarly, studies by Lay, Khoo, Munting, and Chong (2012) and Lay, Khoo, Treagust, and Chandrasegaran (2013) concluded that students in Malaysia were at the minimum level of literacy on energy saving. Not only that, a study on students from the

Universiti Utara Malaysia also clearly shows low awareness about energy saving (Tuan Pah Rokiah, 2013). This proves that students, whether at secondary level or university level, still fail to understand the fact that electricity saving is a good environmental value. Also, a study conducted to collect public opinion by Energy Saving Trust (2015) found that younger consumers still did not fully understand their energy bills or the terms used to explain the amount of energy they consumed.

In an effort to publicise and increase awareness about sustainability, educational approaches through the curriculum must be provided from early childhood on energy saving practices, because through the curriculum children are able to obtain information, make decisions, and take action (Hanifah, Mohamad Suhaily Yusri, & Nurul Izzah, 2015). Their study also proves that children, in order to understand environmental concepts and issues, often refer to adults in order to learn more and receive guidance. The children's involvement in the study provided a new perspective when they posed questions. However, children were not able to rationally reason that their actions and involvement could help protect the environment. Thus, it is the responsibility of adults to strengthen this by explaining to the children the reasons for their actions (Bates & Tregenza, 2007).

The educational curriculum in Malaysia is a learning platform for environmental education. Although environmental education is not considered to be a subject, a summary of environmental protection knowledge is included in all subjects such as Science, Bahasa Melayu, English, Visual Arts Education, and has been formally implemented in the curriculum of primary education since 1983 through Kurikulum Baru Sekolah Rendah (KBSR) and continued in Kurikulum Standard Sekolah Rendah (KSSR). A comprehensive focus on environmental sustainability that includes environmental, social, and economic factors continues to gain attention. This clearly means that a comprehensive environmental education is required as a source of knowledge and catalyst for change in individuals' attitudes. Although it is desirable that attitudes change to become pro-environment, education does not currently put much focus on energy saving attitudes (Aguirre, 2014).

In general, attitudes depend on knowledge and behaviour (Maloney & Ward, 1975; Van Liere & Dunlap, 1981; Schahn & Holzer, 1990). Doppelt (2003) explains that the attitude towards sustainability is a clear vision statement based on values directly related to this attitude and its implementation strategy. Thus, in this study, attitude is placed in line with meaning and practice, which are the actions taken as a manifestation or expression of changes in emotions, feelings, and thoughts. The practice has physical elements that are visible to the naked eye.

Methodology

A questionnaire technique was used as research instrument. Data were collected from 423 students from ten primary schools within the district of Batang Padang, Perak, Malaysia. The district of Batang Padang is one of eleven districts in Perak state which includes the parishes of Batang Padang, Bidor, Chenderiang, Slim, Sungkai, Ulu Bernam Timor, and Barat. Based on the categories of rural and urban schools according to the Ministry of Education Malaysia, a huge number of schools in this area are categorised as rural schools. The total

number of primary schools under the administration of the Batang Padang District Education Office is 96. Out of that total amount, 10 schools and 423 respondents from Standard 4 to Standard 6 were chosen for this study. The cluster sampling method was applied at the first stage to choose schools and groups of students; thereafter the selection of respondents was made by simple random selection. A criterion for selection was also the ability to read. The process of filling in the questionnaire was supervised by the researchers in order to help students understand each item in the questionnaire.

The questionnaire included variables of sustainability knowledge in relation to energy saving, as well as energy saving sustainability practices. The number of items and their sources developed for this questionnaire were modified from the saving practices outlined by KeTTHA (2015) and the Association of Water and Energy Research Malaysia (AWER, 2012). Items were measured on a 5-point Likert Scale (1-Strongly Disagree, 2-Disagree, 3-Mildly Disagree, 4-Agree, and 5-Strongly Agree). Green environment variables were studied based on observations divided into five main aspects: namely, garden management system, garden design, greening implementation processes, resource management towards improving efficiency in energy consumption saving and product consumption, and green technology. The observation level of the schools' green environment is summarised by the scores and green environment observation levels at each school studied. A full score was 24 and each element found in the school was given a score of one. The percentage was calculated based on the results of the total green environment observation scores of the schools, which were divided into 24 overall greening elements and then multiplied by 100 percent. The score percentage calculated was classified into three stages: namely, low level (1%–49%), medium level (50%–79%), and high level (80%–100%).

The items went through two stages of validation which were content validity and face validity. Four experts in the areas of education, measurement, assessment, and geography (hydrology/water) studied the items developed. The improvement process was carried out according to the views of the experts before the pilot study was conducted. The pilot study was carried out twice in order to improve the reliability of the items used. The first pilot study involved 30 respondents and the second pilot study involved 50 respondents. The reliability test based on the Cronbach's Alpha analysis for all the variables clearly showed an acceptable reliability level (Table 1) using the reliability index of Cohen, Manion, and Morrison (2000). Then, the data were analysed using SPSS version 22 software. The inferential Pearson's correlation test was performed to see the relationship between the variables in this study.

Table 1: Studied Items' Reliability Values

Variables	Sub Variables	Number of Items	Value of Cronbach's Alpha (Student)
Knowledge Sustainability Energy Saving	Electricity Saving	8	0.706
	Water Saving	8	0.717
	Protect the Environment	8	0.712
	3R Knowledge	8	0.716
Sustainability Practices Energy Saving	Electricity Saving	8	0.728
	Water Saving	8	0.709
	Protect the Environment	8	0.716
	3R Knowledge	8	0.729

Findings and Discussion

A total of 423 students were involved in the study. The findings show that a total of 76 student respondents (18.0%) went to schools in urban areas while the remaining 347 respondents (82%) went to schools in rural areas. In terms of school year, a total of 198 students (46.8%) were in Standard 6, 121 students (28.6%) were in Standard 5, and 104 students (24.6%) were in Standard 4. With regard to gender, 253 respondents (59.8%) were female and the rest were male students. Respondents' distribution by race was as follows: 251 Malay respondents (59.3%), 89 Indians (21.0%), 48 Chinese (11.3%), and 35 Orang Asli/aborigines (8.3%).

The Analysis of Carbon Footprint Emission Rate in Terms of Electricity Consumption in Schools

For the purpose of analysing the rate of carbon footprint emission in terms of electricity consumption in schools for this study, three levels were set: low level (less than 1000 kg of CO2 / kWj), medium level (1001–2000 kg CO2 / kWj), and high level (more than 2001 kg CO2 / kWj). The analysis results show the average electricity consumption level (kWj) and the amount of carbon dioxide (kg CO2 / kWj) emitted by all ten studied schools. Out of the total of ten studied schools (Table 2), SK 2 consumed the highest amount of electricity per month, which was 3723 kWj and the approximate amount of carbon dioxide emitted was 2494.41 kg CO2 per kWj. This was followed by SJK (T) 10, with average electricity consumption per month of 2487 kWj and an approximate carbon dioxide emission of 1667.29 kg CO2 per kWj. Of the 10 studied schools, one school was found to be at the high level of carbon footprint emission in terms of electricity consumption in school, three were at a medium level, and six schools were at a low level. This shows that in the studied schools area the majority of carbon footprint emissions were still at a low level because of the green environment factors implemented at the schools; this was also influenced by the physical geography of the school areas which were located in the highlands. A

study by Afzainizam (2014) explains that thermal comfort, such as the location of an area surrounded by green plants, helps an individual to reduce electricity consumption. The high rate of electricity consumption is also closely related to the design of the schools in Malaysia; uncomfortable conditions such as poor classroom ventilation results in high electricity consumption (Mohd Najib, 2008).

Table 3: The Amount of Carbon Dioxide from Electricity Consumption in Each School

No	School	Average electricity consumption level (kWj) per month	Amount of carbon dioxide (kg CO_2 / kWj)	Electricity consumption level
1	SK1	1877	1257.59	Medium
2	SK 2	3723	2494.41	High
3	SK 3	1961	1313.87	Medium
4	SK 4	845	566.15	Low
5	SK 5	466	312.22	Low
6	SK 6	642	430.14	Low
7	SK 7	1406	942.02	Low
8	SK 8	925	619.75	Low
9	SJK(C) 9	1355	907.85	Low
10	SJK (T) 10	2487	1666.29	Medium

The green environment observation levels of the schools were summarised based on the score levels and green environment observation levels of each school studied (Table 3). The green environment components recorded were garden management system, garden design, greening implementation process, resource management to improve efficiency and saving on products consumption, and green technology. Each of these components contained several assessment criteria (Appendix 1). From the score classifications of the green environment level it was found that the green environment level of the studied schools was mostly at a medium level for a total of five schools. The rest of the four schools were at a low level, with a percentage value of less than 50 percent. The correlation between the findings of sustainability practice levels and observation data proved that the schools did not encourage exposure to green environmental practices. Green environmental protection by the private sector should not be an action that prevents students' participation in environmental studies at schools. Encouragement for students to engage is a good hands-on activity in forming sustainability practices. In fact, teachers play an important role in providing guidance which produces results that can be shared with families and society in the future (Hanifah et al., 2015, Kalsom et al., 2015).

Table 3: Score and Level of Green Environment Observation in the Schools

Schools	Score from total mark (24 marks)	Percentage score (%)	School green environment level
SK1	10	41.7	Low
SK 2	14	58.3	Medium
SK 3	11	45.8	Low
SK 4	10	41.7	Low
SK 5	15	62.5	Medium
SK 6	13	54.2	Medium
SK 7	15	62.5	Medium
SK 8	12	50.0	Medium
SJK(C) 9	11	45.8	Low
SJK (T) 10	13	54.2	Medium

An Analysis of the Relationship between Knowledge, Green Environment, Sustainability Practices and Carbon Footprint Analysis in the Schools

The value of Spearman's non-parametric correlation test analysis can be categorised by the strength of the relationship between variables by using the indexes given by Cohen (1992) which are: (a) a correlation coefficient below 0.30 indicates a low strength of relationship, (b) a correlation coefficient ranging from 0.30 to 0.50 indicates a moderate strength of relationship, and (c) a correlation coefficient greater than 0.50 indicates a strong relationship. The findings (Table 4) show a significantly low relationship between sustainability practices and sustainability knowledge variables (r=1.52**) and between sustainability practices and carbon footprint analysis variables (r=1.45**). There was also a significantly weak relationship between green environment and carbon footprint analysis variables (r=-.107*). This relationship proves that the campaign and information conveyed by the teachers, including articles from the mass media or social media, show good signs in terms of 3R practices. On the other hand, there was no significant relationship found between sustainability practices and green environment variables, and between sustainability knowledge and green environment. The exposure of knowledge followed by positive practices towards sustainability, especially among the youths to fully understand their energy bills or the terms that explain how much energy they consume and steps to reduce carbon emissions, need to be implemented as recommended by the Energy Saving Trust (Richard, 2016).

Table 4: Correlation Coefficient of Sustainability Practices and Green Environment Sustainability Practices Variables towards Carbon Footprint Analysis

	sustainability knowledge		Carbon Footprint Analysis		Green environment	
Variables	r	p	r	p	r	p
Sustainability Practices	.152**	.002	.145**	.003	-.045	.354
Sustainability knowledge			.029	.552	.028	.564
Carbon Footprint Analysis					-.107*	.028

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

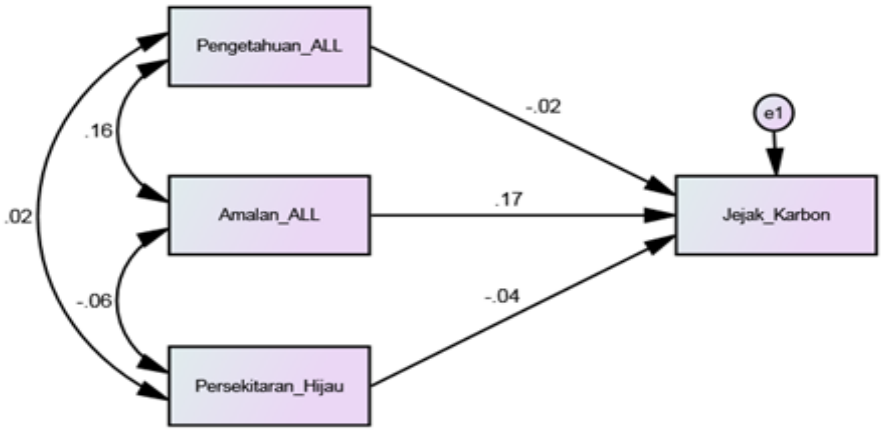
An Analysis of the Influence of Sustainability Practices, Sustainability Knowledge, and Green Knowledge towards Carbon Footprint Analysis

This study also aims to investigate the effect and contribution of independent variables (sustainability practices, sustainability knowledge, and green knowledge) on carbon footprint analysis in schools. The results of the path analysis (Figure 2 and Table 5) are significant, showing that among all three predictor variables (sustainability knowledge, sustainability practices, and green environment), sustainability practices is the only factor that led to the production of carbon footprint in the studied areas. The results of the analysis show that sustainability practices significantly contributed three percent of changes in variance to the carbon footprint. The beta findings were also in line, as shown in Figure 2 and Table 5, in which sustainability practices are at 0.17, followed by sustainability knowledge with a negative value of -0.02 and green environment with a negative value of -0.04. These findings show that sustainability practices contributed to carbon footprint rather than sustainability knowledge and green environment. The contribution of sustainability practices towards carbon emissions is in line with the study carried out by Ai, Kiyo, Hiroshi, Shuichi, and Keisuke (2014) which also proves that an exposure to sustainability results in positive impacts on attitude, especially through the examples set by parents' attitudes. As a matter of fact, the study by Hanifah et al. (2014) and Hanifah and Muhamad Suhaily Yusri (2016) discussed the influence of adults in shaping good sustainability practices among students. In effect, schools should prepare their own sustainable school model in order to provide opportunities for the students to participate and engage in environmental protection (Barr, & Dunba, 2011). A research study by Dennis and Lisa (2013) also shows that the implementation of these sustainability practices and activities depend on the school's administration. According to the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behaviour (Ajzen, 1991), psychologically humans need to be given knowledge in order to shape their behaviour. This means that if the government

aims to shape a generation that understands the meaning of environmental sustainability, this generation has to be exposed through education together with practices such as those suggested by some researchers (Kelly & Brian, 2012; Scoullos & Malotidi, 2004).

Table 6: Influence of Independent Variables on Carbon Footprint

Variables	Carbon Footprint Analysis		**t**	***p***	Contribution
	B	***β***			**(%)**
Constant	395.739				
Sustainability Practices	333.554	0.17	-0.342	0.732	3
Sustainability knowledge	-27.464	-0.02	3.440	0.001	No
Green environment	-13.676	-0.04	-0.812	0.417	contribution
F=4.301	R=0.173				
Sig F= *p<0.05*	R^2=0.03				



Legend:

Pengetahuan_ALL	: Sustainability Knowledge
Amalan_ALL	: Sustainability Practices
Persekitaran_Hijau	: Green Environment
Jejak_Karbon	: Carbon Footprint

Figure 2: Path diagram of the relationship between sustainability knowledge, sustainability practices, and green environment on carbon footprint analysis in schools.

Conclusion

The research findings show that overall carbon footprint emissions in the school areas are still at a low level because of good energy saving sustainability among the school students. However, the aspects of green environment knowledge and saving practices should be given more focus, so that sustainability practices can be improved as a result of exposure to

sustainability knowledge. There should be a continuous effort to improve energy saving sustainability practices in order to reduce carbon emissions in school areas, particularly with regard to the use of electrical appliances. The analysis on the relationship of each studied variable through correlation and regression analyses finds that there was a relationship between energy saving practices and carbon footprint analysis. This shows that the rate of carbon footprint emission is proportional to energy saving practices among school students. However, further research should be implemented which considers the involvement of school members other than students such as the teachers and school staff, because they too can influence electricity consumption in schools.

The younger generation should not waste available resources so that environmental sustainability can be maintained. Electrical energy is generated from basic resources such as hydro energy, natural gases, crude oil, and coal. These resources are known as conventional energy and will expire as time passes because this kind of energy is not renewable. Therefore, electrical energy has to be consumed efficiently and wisely. The role of schools in providing an exposure to energy saving practices to both teachers and students is very significant in order to achieve sustainability even on a small scale such as at a school.

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Corresponding Author

Hanifah Mahat, PhD
Department of Geography & Environment,
Faculty of Human Sciences,
Sultan Idris Education University,
35900 Tanjong Malim, Perak, Malaysia.
email: hanifah.mahat@fsk.upsi.edu.my

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Appendix

	Greening Activities Observation	**Number of schools that provides greening activities**
A.	**Garden Management System**	
i.	Human resource	10
ii.	Management plan	10
iii.	Duty schedule	10
iv.	Monitoring garden's habitat	2
B.	**Garden's Design**	
i.	Condition of garden's landscape	8
ii.	Cleanliness of the garden	8
iii.	Layout of the garden	8
C.	**Greening Implementation Process such as:**	
i.	Planting programme using organic fertilisers	3
ii.	One student one tree programme	0
iii.	Planting, conservation and preservation of appropriate species trees	5
iv.	Labelling the trees using local and scientific names	1
v.	Composting project	0
vi.	Build learning station	8
vii.	Field maintenance	10
D.	**Resource management towards improving efficiency and consumption saving**	
i.	Water	7
ii.	Electrical energy	7
iii.	Consumable materials such as paper, printer toner,	8

	printer cartridge	
iv.	Office, classroom, canteen, laboratory and workshop wastes	8
v.	Suggestions on saving through notice, notice board, poster, announcement	1
E.	**The use of green products and technology such as**	
i.	Rainwater harvesting	1
ii.	Solar energy equipment	0
iii.	Organic fertilisers	1