

The Role of Environmental Auditing and Monitoring in Greening TVET: A Case Study of Ol'lessos Technical Training Institute

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Abstract

Developing a mindset and a culture that is sensitive to issues of climate change, environmental pollution and scarcity of resources in Technical and Vocational Education and Training (TVET) institutions is paramount towards transforming the society and encouraging sustainable development. To do this, TVET institutions must demonstrate good practices to the trainees and be in the fore front in reducing their carbon footprint. Comprehensive Environmental Auditing and Monitoring (EA&M) promotes prudent resource generation and utilization with positive social impacts as well as safe and healthy environment at all stages of a project operation and decommissioning. It also enhances the implementation of institutional environmental policy by providing up-to-date implementation mechanisms and indicators. In this connection, this study examined the role of EA&M in greening TVET. The study also endeavored to find out the capacity of Ol'lessos Technical Training Institute (OTTI) staff to carry out credible EA&M. The study utilised exploratory studies using both qualitative and quantitative methods. Data collection tools included questionnaires, interview and observation schedules, and content analysis. The findings revealed that 76% of the respondents had an idea of what EA&M was. In addition 88%, of the respondents were of the view that EA&M would help them in changing their attitudes and towards environmental degradation and sustainability. The study showed that majority of OTTI staff was not adequately trained to carry out self and compliance EA&M. The level of awareness of issues of climate change generated by EA&M in OTTI community had encouraged adoption of green attitudes. The study recommends the integration of EA&M in environmental policies of institutions in order to effectively inculcate green attitudes and lifestyles in TVET graduates. In addition, capacity building of staff should be carried out to enable them perform credible self and compliance EA&M.

Key words: *Environmental auditing, monitoring, policy, green attitudes*

Introduction

Environmental audit is the systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing in conserving or preserving the environment (Environmental Management and Co-ordination Act [EMCA], 1999). Its main objective is to assess an organization's activities and services in relation to compliance with relevant statutory and internal requirements, promoting good environmental management, establishing the performance baseline for developing an environmental management system (EMS), maintaining credibility with the public, raising staff

Awareness on environmental emerging issues, enforcing commitment to environmental policy, and exploring improvement opportunities (Waswa, Kambona & Mireri, 2007). On the other hand Environmental monitoring is the continuous or periodic determination of actual and potential effects of any activity or phenomenon of the environment whether short- term or long-term (Assessment and Audit Regulations, 2003). Therefore it entails continuous and systematic collection of environmental data which is analysed and used for decision-making (Waswa, Kambona & Mireri, 2007). Environmental Audits have been a legal requirement in Kenya since the year 2004 for TVET institutions and all projects specified under schedule 2 (EMCA, 1999) after the Environmental {Impact Assessment and Audit} Regulations (2003), came into force. According to International Centre for Technical and Vocational Educational Training {UNEVOC} (2017), greening is a process of pursuing knowledge and practices with the aim of being more environmentally friendly and enhancing decision-making and lifestyle in more ecologically responsible manner that can lead to environmental protection and sustainability of the natural resources for current and future generations. This involves adapting institutional operating goals and methods so as to improve the overall efficiency, conformity and costs in running the institution. Aruna and Karsten (2013) observed that greening colleges is a holistic approach to transforming training providers with focus on five strategic dimensions of greening which include green campus, curriculum, community, research and culture. All these areas are addressed in EA&M and hence conducting it would greatly contribute to the process of greening TVET.

Objectives

The study was guided by the following specific objectives:

- i. To investigate the level of awareness of Environmental Auditing & Monitoring in Ol'lessos Technical Training Institute community
- ii. To establish the extent to which Environmental Auditing & Monitoring has inculcated green attitudes in Ol'lessos Technical Training Institute community.
- iii. To find out the capacity of Ol'lessos Technical Training Institute staff to carry out compliance and Self Environmental Auditing & Monitoring.

Literature Review

To stabilize the increasing concentration of greenhouse gases in the atmosphere and adapt to climate change will take the concerted action of everyone and all parts of society (Thad, 2010). According to the Greening Colleges Approach proposal of Majumdar (2011), colleges should become role models for environmental friendliness as well as a source of inspiration, and an innovative and profound training provider as well as accepted strategic partner for a sustainable development of their regions. Majumdar (2011) observed that preparation for work should equip people with the knowledge, competencies, skills, values and attitudes to become productive and responsible citizens who appreciate the dignity of work and contribute to sustainable societies. Education is the fundamental lever for change.

According to Erol and Gezer (2006) education for sustainable development promotes the values and knowledge necessary to help women and men to cope with change, complexity and uncertainty, to adopt new consumption patterns, and to transform mindsets and behaviours. This is the education for the future. The ultimate aim of education is shaping human behavior (Erol & Gezer, 2006). Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their needs by maintaining the carrying capacity of the supporting ecosystem (The Environmental (Impact Assessment and Audit) Regulations, 2003). The greening of TVET institution process invites actors of training and learning to engage in approaches that seek to develop knowledge, skills and attitudes that can lead to more sustainable practices in the community, the workplace and other settings where knowledge and skills could be applied (UNEVOC, 2017). The National Environment Management Authority of Kenya (NEMA) is a major player in sustainable development in Kenya.

Role of National Environment Management Authority in Environmental Auditing

NEMA has been tasked by Kenyan law to identify projects and programmes for which environmental audit or environmental monitoring must be conducted. In addition NEMA is required to undertake, in cooperation with relevant lead agencies, programmes intended to enhance environmental education and public awareness, about the need for sound environmental management, as well as for enlisting public support and encouraging the effort made by other entities in that regard (EMCA, 1999). Environmental (Impact Assessment and Audit) Regulations (2003) describes in detail the roles of NEMA when an organization is carrying any environmental audit.

Environmental Auditing

Environmental auditing is an organization's means of gathering environmental information to see whether or not the organization is environmentally sound (Waswa, Kambona & Mireri, 2007). The main objective is to assess an organization's activities and services in relation to compliance with relevant statutory and internal requirements, promoting good environmental management, establishing the performance baseline for developing an environmental management system (EMS). In addition it helps an organization in maintaining credibility with the public, raising staff awareness and enforcing commitment to environmental policy and in exploring improvement opportunities (Waswa, Kambona & Mireri, 2007). EMCA (1999) requires that an environmental audit study be undertaken on on- going projects commenced prior to the coming into force of the regulations, and on new projects undertaken after completion of an Environmental Impact Assessment (EIA) study report. It is the responsibility of the project proponents to undertake the environmental audit exercise. They are thus expected to take all reasonable measures to mitigate any undesirable effects whether anticipated or not contemplated in the EIA report. However, an environmental audit can also be undertaken in the interest of an individual or a

member of the public after showing reasonable cause to NEMA (Waswa, Kambona & Mireri, 2007). Environmental (Impact Assessment and Audit) Regulations (2003), require an organization to carry out Control and Self Audits. A control Audit is used by regulatory NEMA whenever it deems it necessary to check compliance with specific environmental practices or to verify self-auditing reports. A control audit may for example, confirm that an environmental management plan of a project is being adhered to. It may also verify the adequacy of the environmental management plan in mitigating negative impacts of a project. The owner of a premise or the operator is required to prepare and submit an environmental audit report to NEMA. Such self-audits are conducted internally by organizations in order to continuously improve on their environmental management practices (EMCA, 1999). Thus, the existence of an organizational Environmental Management System or Environmental Policy is necessary. OTTI has been carrying out annual environmental audits in compliance with the law.

Methodology

The study utilised exploratory research design incorporating both qualitative and quantitative methods. Stratified random sampling was used by dividing the target population into teaching staff, Essential services staff and students as the major strata. The sample size is the number of respondents the researcher selects from the target population to constitute a sample that fulfils the requirements of representativeness of the target population. At least 10% of the accessible population is required for a representative sample to be obtained (Mugenda & Mugenda, 2003). This study utilised 25%, 20% and 15% of OTTI teaching staff, Essential services staff and students respectively representing 35 members of teaching staff, 15 Essential services staff and 150 students were sampled. The tools used to get views of the respondents were questionnaires and interview schedules. Observation was used for 1 month to establish the effectiveness of laid down procedures. Document analysis was also used as a mode of data collection that included environment audit reports, work environment survey reports, strategic plans and performance contracting documents.

Findings and Discussions

OTTI has been carrying out the annual environmental audits to comply with the law. In addition the institution has shown progressive implementation of recommendations as indicated in the environmental audits reports. For example, the improvement of waste management system in the institution in accordance with the Environmental Management Plan was achieved as proposed in the Environmental audit report of 2015. These included, labelling of waste bins, separation of waste materials, storage and transfer of data in softcopy and flip over printing.

Gender of the Respondents

Data on gender of the respondents was sought because men and women perceive environmental issues differently (Burer, 2014). The majority of the respondents were male (60.5%) which can be attributed to the fact that the male population in

the college is higher for both staff and students. The female respondents were 39.5 % which was considered satisfactory.

Duration of Stay in Ol'lessos Technical Training Institute

Respondents who have lived longer in an area were more experienced and are in a position to explain its progress and activities accurately (Burer, 2014). Data on the duration of respondents stay at OTTI

Indicate that 82.5% of the respondents had stayed at OTTI for more than one year. Therefore the information they provided on environmental auditing was reliable in making valid conclusions and recommendations.

Level of Training

The education level of respondents was sought to determine their understanding of environmental issues and EA&M. The data obtained was as shown in Table 1.

Table 1 Level of Training for Teaching and Support Staff

Statements	Level	Freq	%
<i>I am a trained to conduct internal EA&M Adequately</i>	<i>Yes</i>	5	10
	<i>No</i>	45	90
<i>I am a registered by NEMA to conduct EA&M</i>	<i>Yes</i>	1	2
	<i>No</i>	49	98
<i>I would like to be trained to conduct internal EA&M</i>	<i>Yes</i>	36	72
	<i>No</i>	14	28
<i>Highest level of education</i>	<i>Below Certificate</i>	0	0
	<i>Certificate</i>	6	12
	<i>Diploma</i>	9	18
	<i>Higher Diploma</i>	1	2
	<i>Degree</i>	26	52
	<i>Post Degree</i>	8	16

The study revealed that 68% of the OTTI staff had undergraduate and post graduate degrees, and because of integration of Education for Sustainable Development in Kenya, it was assumed the largest percentage understood climate change issues clearly. For a person to be registered by NEMA and to be trained for EA&M, he is required to have a minimum of an undergraduate degree (NEMA, 2017). This means 68% of OTTI staff could be facilitated to get the EA&M training and get

NEMA registration as Associate or Lead Experts. In addition, 90% of the staff respondents indicated that they were not adequately trained to carry out credible self EA&M. This meant only 10% could be involved in self auditing which is not adequate. However, the study shows that that 72% of the respondents would like to be trained to carryout self audits

Level of Awareness of Environmental Audit and Monitoring

The awareness was analysed in a Likert scale of five levels as shown in Table 2. The findings revealed that 76% of the respondents had an idea of what EA&M was about. This can be explained from the fact that EA&M is carried out at OTTI. Although the compliance audits are conducted by out-sourced personnel, the OTTI community are involved in the auditing process (Obara, 2015).

Table 2 *Level of Awareness of Environmental Audit and Monitoring*

Statements	Level	Freq	%
I have an idea of what is EA&M	Strongly agree	12	6
	Agree	152	76
	Undecided	4	2
	Disagree	25	12.5
	Strongly disagree	7	3.5
	Total	200	100

Effects of Environmental Auditing and Monitoring on Resource Management and Integration in Curriculum

This was used to gauge the extent to which EA&M has contributed in greening TVET in terms of resource management, research interventions, educating community on climate change and integration of climate change issues in curriculum. The data obtained was as shown in table 3.

The results show that 68% of the respondents agreed that energy and water resources are managed efficiently, 63% agreed that OTTI offers formal and informal training for community in response to climate change, 56% agreed that OTTI conducts basic research interventions to respond to the needs of industry and community in response to climate change, and 54% agreed that climate change issues are integrated in the existing courses informally or formally as a result of EA & M awareness in OTTI. Only less than 10% strongly disagreed with the statements. It can therefore be concluded that EA&M helps to: establish green TVET institutions where resources such as energy and water resources are managed efficiently, integrate existing courses with emerging issues for clean and green jobs, and for establishment of green communities.

Table 3 Effects of Environmental Auditing & Monitoring on Resource Management and Integration in Curriculum

Statements	Level	Freq	%
Energy and water resources are managed efficiently	Strongly agree	47	23.5
	Agree	136	68
	Undecided	8	4
	Disagree	6	3
	Strongly disagree	3	1.5
OTTI offers formal and informal training, for community in response to climate	Strongly agree	29	14.5
	Agree	126	63
	Undecided	17	8.5
	Disagree	20	10
	Strongly disagree	8	4
OTTI conducts basic research interventions to respond to the needs of industry and climate change	Strongly agree	57	28.5
	Agree	112	56
	Undecided	9	4.5
	Disagree	15	7.5
	Strongly disagree	7	3.5
Climate change issues are integrated in the existing courses informally or formally	Strongly agree	25	12.5
	Agree	108	54
	Undecided	35	17.5
	Disagree	18	9
	Strongly disagree	14	7

Environmental Auditing & Monitoring Effect on Attitudes

Green attitude is an orientation towards putting the values based on sustainability, environmental protection and responsible behavior on the fore front (Kiprotich, 2014). The data shown in table 5 above was used to gauge the extent to which EA&M has inculcated green attitudes in the OTTI community. According to the findings of this study 56% of the respondents agreed that they had started practicing energy saving ideas and 68% agreed they had started using alternative green energy sources instead of fire wood because of climate change awareness they had received at OTTI. In addition 75.5% agreed they had started practicing good waste disposal practices while 57% strongly agreed, while 26% agreed that they had started practicing water saving strategies as a result of what they had observed in OTTI. In

addition, 58% strongly agreed, while 30% agreed that involvement in EA&M would help them in changing their attitudes towards environmental degradation and sustainability. This is in agreement with UNESCO (1992) who concluded that formal and non-formal education is indispensable to changing people's attitudes.

Table 4 *Effect of Environmental Auditing & Monitoring on Attitudes*

Statement	Level	Freq	%
I have started practicing energy saving ideas as a result of awareness that I have obtained in OTTI	Strongly agree	65	32.5
	Agree	112	56
	Undecided	9	4.5
	Disagree	8	4
	Strongly disagree	6	3
I have started using alternative green energy instead of fire wood because of climate change awareness I have received at OTTI	Strongly agree	42	21
	Agree	123	61.5
	Undecided	11	5.5
	Disagree	11	5.5
	Strongly disagree	13	6.5
I have started practicing good waste disposal practices as a result what I have observed in OTTI	Strongly agree	28	14
	Agree	151	75.5
	Undecided	8	4
	Disagree	10	5
	Strongly disagree	3	1.5
I have started practicing water saving strategies as a result of what I have observed in OTTI	Strongly agree	114	57
	Agree	52	26
	Undecided	14	7
	Disagree	14	7
	Strongly disagree	6	3
If I am involved in internal EA & M it would assist me to have a better attitude towards environmental degradation and sustainability	Strongly agree	116	58
	Agree	60	30
	Undecided	15	7.5
	Disagree	4	2
	Strongly disagree	5	2.5

Conclusions

The level of awareness of issues of climate change generated by EA&M in OTTI community encouraged adoption of green attitudes. The majority of the OTTI staff had no formal training in EA&M but they had interest in being involved in EA&M processes. Environmental Auditing and Monitoring was found to be an important tool that should not be ignored in the process of greening TVET.

Recommendations

TVET institutions should consult NEMA and NEMA-accredited firms on ways of incorporating EA&M in their environmental policies in order to effectively inculcate green attitudes and lifestyles in TVET graduates. Capacity building for both teaching staff and essential services staff should be carried out to enable them execute credible self and compliance EA&M.

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