The Status of Tanzania's Primary School Curriculum on Environmental Education From 1980s-2010s

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Abstract

This paper reports on the historical assessment of the status of Tanzania's primary school curriculum in addressing environmental issues. The study covers a period of 30 years of integrating environmental education (EE) in school subjects, focusing on the extent of coverage, nature and organization of the content, teaching approaches and methods as well as relevance of the content in addressing environmental issues. This period witnessed heightened interest and public concern on EE, specifically in policy formulation hence the integration of the subject matter in the school syllabus. The study employed the mixed methods research approach to collect data. Purposive and simple random sampling were used to select heads of schools, teachers and standard VII pupils. The findings indicate that EE themes are incorporated in all school subjects through the multidisciplinary approach. Further, the content was mostly covered in Geography with a high percentage of topics 78.6% (1980-1989), 80.8% (1990-1999) and 81.3% (2000-2009), respectively. On the nature and organization of the content, the findings indicate that topics pertaining to EE were starting to be gradually introduced in the school curriculum organized around key learning areas. Also, the findings indicate that the teaching-learning approach used was predominantly the non-participatory lecture method. Furthermore, it was found that EE was seemingly irrelevant in addressing local environmental issues. To realize the critical role of EE in creating informed citizens, this study recommends that teachers should be trained in EE. The study further recommends an immediate review of Tanzania's primary school curriculum to include adequate, relevant and practical EE content. Therefore, it argues for the design of a curriculum oriented to solving problems as a suitable approach to the provision of EE.

Keywords: Curriculum change, multidisciplinary, environnemental problems, syllabus, policy.

Introduction

As an innovation in education, the policy of environmental education (EE) has a long history of being incorporated in Tanzania's primary school curriculum. The importance of EE for creating environmental literacy among people, especially in developing countries, including Tanzania, cannot be overstated. It is the kind of education that, when deliberately planned and implemented, works towards enabling individuals to adapt to the processes and constraints of the environment in which they find themselves. The teaching of EE in primary schools provides a vital opportunity for young people to acquire environmental literacy and provides many people with knowledge regarding sustainable development.

Globally, the history of EE as a formal field of study can be traced back to its formal establishment forty years ago. This period has been remarkable through a number of important international conferences and agreements that have influenced and shaped policies and practices in EE. Notable ones are the United Nations Conference on Human Environment in 1972; the International Environmental Education Workshop at Belgrade in 1975; the

Intergovernmental Conference on Environmental Education in 1978; the World Commission on Development and Environment in 1987; and the Earth Summit of 1992. All these shed light on the development of EE internationally, regionally and locally.

Following the United Nations Conference on Human Environment in 1972, EE was ushered into the mainstream circles of education (UNESCO-UNEP, 1978; Robottom, 2007). This conference represents a time in history when people, globally, congregated to discuss environmental problems threaten humans' survival. In connection with this, three years later, in 1975, the Belgrade Conference was held as a follow-up in which the Belgrade Charter, a document that captured the conference resolutions, was compiled (Jickling, 2007). The Tbilisi Conference of 1977 was therefore a culmination of these two landmark conferences, which formed an important part of the process that formalized EE and placed it on the mainstream education agenda and curricula in many parts of the world, including Tanzania.

The Development of Environmental Education in Tanzania

Tanzania, like other countries in the world, has been facing various environmental problems, including deforestation, loss of wildlife habitats and biodiversity, land degradation, drought, deterioration of the aquatic systems, the lack of accessible good quality water, and environmental pollution (VPO, 1997, 2006). Environmental problems, challenges and their associated risks have been and still are increasing at an alarming rate. These serious problems need urgent attention through education, in particular EE.

It has been recognized that effective EE, both formal and non-formal, is vital in the fight against environmental threats. Furthermore, EE would help people get rid of environmental problems and avoid their recurrence in the future. In addition, it has been realized that EE would enhance and promote conservation measures, such as planting trees to conserve land and water resources, as well as proper farming methods, among others. The Tanzanian government, through the National Environmental Policy (NEP) of 1997, admitted that the country needed to adopt environmentally sustainable natural resource management practices to ensure that long-term sustainable economic growth is achieved (VPO, 1997). EE as a means of creating awareness and concern about environmental management gained momentum in Tanzania in the 1980s. The government’s view was partly due to the declining wealth of the country because of environmental degradation, coupled with global concern about the environment. These have influenced thinking in terms of the formulation of policies in various sectors and curricula in the formal education system at all levels (VPO, 2004; Mtaita, 2007; Kimaryo, 2011).

Additionally, with the issuing of the Education and Training Policy (ETP) in 1995, it was decided that EE should be integrated in all subjects at all levels of schooling (MoEC, 1995, MoEVT, 2006). The issue of environmental management and conservation has been spelt out clearly in the objectives of education in Tanzania. The ETP emphasises, among others, that EE should enable the rational use, management and conservation of the environment (MoEC, 1995). As a result, curriculum review has been incorporating EE issues in the school curricula over time (VPO, 2004; MoEVT, 2007).

The Concept of Environmental Education and its Aim

Environmental education refers to the process of recognizing values and clarifying concepts in order to develop the skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings (Palmer, 1998, p. 27).

It should also entail people individually and collectively making decisions and formulating a code of conduct on issues concerning environmental quality, finding a solution to current problems and preventing new ones.

EE is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitude, motivation, commitment and skills to work individually and collectively to find a solution to current problems and to prevent new ones (IUCN, 1970; UNESCO-UNEP, 1978, p. 29).It is aimed at producing recipients with a full understanding of environmental issues who will act responsibly. It enables individuals and communities to understand the complex nature of the natural and built environment resulting from the interaction between their biological, physical, social, economic and cultural aspects. It enhances knowledge, values and attitudes, and imparts practical skills for participating in a responsible and effective way to anticipate and solve environmental problems, as well as ensuring the quality of the environment (UNESCO-UNEP, 1978). Therefore, EE programmes should consider objectives focusing on promoting awareness, knowledge, attitudes, skills and participation.

Coverage of environmental education in the school curriculum in Tanzania

According to Palmer (1998), the curriculum for EE refers to the sum total of learners' experiences that will help them to develop environmental literacy and problem-solving and decision-making skills and to actively participate in taking action regarding the environment while taking into consideration ecological, political and economic aspects. The definition implies that, when covering EE, the curriculum should plan to instruct what learners need to know about EE.

Following the environmental problems facing the country and as a response to international agreements, Tanzania has included EE in the formal curriculum at all levels (MoEVT, 2004). It is anticipated that through EE, pupils will be environmentally literate. Meyers (2006) suggests that it is important for the curriculum to develop learners' understanding of ecological processes, the human impact on them, and the socio-political systems that influence human beliefs and actions with regard to the environment.

Methods and Approaches for Teaching Environmental Education

Lee & Williamson (2001) contend that for effective implementation of EE, appropriate teaching and learning methods need to be used to address the components of EE, namely, education on all matters concerning the environment. Teaching methods should engage pupils in critical inquiry into real issues concerning the environment and development, as well as promoting actions that will address those issues (Stevenson, 2007). Based on the holistic nature of EE, learning styles and methodologies which are participatory in nature are suggested (Sterling, 1992). However, as regards EE, whichever approach or combination of approaches is utilized, first-hand experience of the environment is at the forefront of teaching and learning (Palmer & Nea1, 1994).A model for teaching and learning should be formed to ensure continuity of the teaching matter and adequate coverage.

Tanzania's primary education curriculum emphasizes teaching and learning methods which make students active participants in the learning process (MoEC, 1995). Pupils learn better when teaching methods are used that are active, participatory and relate to real life situations. Such methods provide learners with higher order and critical thinking skills and stimulate learning, which is important for the learning of EE (Moon, 2008). Despite the emphasis on using participatory methods for teaching and learning EE, it is questionable whether teachers

can employ them, given the classroom context and conditions in which they implement the curriculum.

Relevance of EE in Addressing Environmental Issues and Problems

Concern for the environment can be described as a feeling of care and responsibility for the environment (Kimaryo, 2011, Makundi, 2003; Ndeskoi, 2007). There are two sides to EE, namely the search for scientific and technical knowledge on how to manage and solve environmental problems on the one hand and, on the other, helping individuals develop a sense of care and responsibility for the earth (Chawla, 2006). Developing a sense of care refers to environmental concern, either for the welfare of humans or for all living things. It is maintained that one of the aims of teaching EE in schools is to develop in learners a concern for the environment. Thus, the teaching of EE in schools has to influence learners' care and concern for the environment. These qualities can be demonstrated by an individual's involvement in conservation activities, like proper waste management, practising green farming, and reading literature about the environment from different sources. However, it is noted that if schools focus on learning about environmental problems and their consequences, they might end up producing worried thinkers rather than environmentally concerned individuals (Kimaryo, 2011; Makundi, 2003). It is therefore important that curricular processes provide pupils with opportunities which will make them develop feelings that will make them want to take appropriate action concerning the environment, thereby caring and having a concern for their immediate environment.

Curriculum Development and Syllabus Formulation in Tanzania

The Government of Tanzania has at different periods attempted to integrate EE in the national curriculum. The MoEVT set up a special EE unit which produced *Guidelines for Environmental Education in Primary Schools* (MoEC, 1995; MoEVT, 2005). EE to some extent is given attention in some subject syllabi. In the primary education sector, the Social Studies curriculum was supposed to give some attention to environmental issues. Other subjects such as Mathematics, Kiswahili, vocational skills and the English language are, in principle, supposed to integrate some environmental concepts, although in actual practice, this is yet to be ascertained. Various studies by Makundi (2003), Lotz-Sistka (2002), Odeke (2009) and Haindongo (2013) report that school curricula in many parts of the world are rigid and geared towards examination-oriented teaching, which seldom considers local community issues. Therefore, this study sought to evaluate the status of Tanzania's primary school curriculum with regard to EE, focusing on content coverage, organization of topics, methods and relevance in addressing environmental issues.

Objectives of the Study

The study evaluates the status of EE in Tanzania's primary school curriculum in addressing environmental issues for a period of 30 years (1980-2010) of curriculum change and review. Specifically, the objectives were to:

i. Assess the extent of EE coverage in primary school curriculum for the period of the curriculum review from 1980-2010.
ii. Examine the nature and organization of EE topics in the curriculum.
iii. Examine the methods and approaches for the teaching and learning of EE topics.
iv. Assess the relevance of EE content in addressing local environmental situations and challenges.

Methodology

This section describes the study's approach, design, area, sample and sampling techniques, data collection instruments and analysis techniques. The study employed the mixed methods approach. Bryman (2008), Creswell and Clark (2011) and Creswell (2012) maintained that mixed-methods research combines methods, philosophies and research design. This study employed mixed-methods for the purpose of combining elements of qualitative and quantitative research approaches to data collection, analysis and inference techniques so as to provide abroad and deep understanding of the issue and to corroborate the findings. The motivation for combining methods was to create flexibility and provide for the researcher's judicious decisions about aspects of the study in order to provide sufficient evidence that would answer the research question. In this approach numeric and text data are produced, analysed and interpreted using the mixed-methods strategy and techniques that are informed by the study's paradigm, and the local context where the study was conducted is recognized.

The study was conducted in Moshi-rural district in Kilimanjaro and Kondoa district in Dodoma. The choice of these study sites was because they are privileged and underprivileged, respectively, in terms of natural endowments. Knowledge of such environmental variations was essential when researching on the implementation of EE in centralized school curricula.

The study employed the simple random sampling technique whereby survey questionnaires were distributed to 240 pupils and 120 teachers. 83% of the distributed questionnaires were filled in and returned. Purposive sampling was used to select six heads of school and six academic mistresses/masters. In the quantitative part, multiple-choice questions based on a Likert-Scale were used, whereby the questions required the rating of certain features regarding the problem under investigation. In the qualitative part, questions were open-ended and sought the opinions of participants on the attributes on EE. Table 1 shows the characteristics and representation of respondents.

Table 1 Respondents' profile and characteristics

Category	Gender	Kondoa District	Moshi-Rural District	Overall	Percentage
Head teachers	Male	2	-	2	33.3
	Female	1	3	4	66.7
Academic masters/mistresses	Male	2	2	4	66.7
	Female	1	1	2	33.3
Pupils	Male	53	57	110	46.8
	Female	64	61	125	53.2
Teachers	Male	7	4	11	16.7
	Female	30	25	55	83.3
Grand total		**160**	**153**	**313**	**100.0**

Data Analysis

According to Creswell and Clark (2007, p. 128), "data analysis in mixed methods research consists of analyzing the quantitative data using quantitative methods and the qualitative data using qualitative methods". This study employed mixed methods to analyse the data. Qualitative data were subjected to content analysis, focusing on the meaning of the statements/phrases made by informants during the interviews and observation. The quantitative data were described statistically. The Statistical Package for Social Sciences (SPSS) program, Version 21, was adopted to analyse the quantitative data, in terms of frequencies, percentages

and cross-tabulation for easy presentation, analysis and interpretation. The Chi-square test was used to determine the differences and associations based on the study variables.

Results

Extent of coverage of environmental education content

The findings indicate that EE topics and sub-topics coverage differed from one subject to another throughout the period under investigation. It was further reported that subjects which have more EE content were Geography (which subsequently combined History, Geography and Civics, named collectively as Social Studies) and Science. Other subjects were English, Kiswahili, Vocational skills and Mathematics. The results indicated significant variations in the level of integration of EE across the school subjects over different periods. Table 2 presents the extent of coverage of EE topics/sub-topics in some school subjects from 1980-2010.

Table 2 Extent of Coverage of Environmental Education Topics/Sub-topics in Some School Subjects from 1980-2010

Period	Subjects syllabi	Total Topics/sub topics per subject	EE Topics/subtopics	Percentages of EE themes (%)
1980-1989	Geography	168	132	78.6
	History	37	10	27.2
	Civics	80	16	20.0
	Science	232	129	55.6
	Mathematics	94	09	9.6
1990-1999	Social Studies	120	97	80.8
	Science	218	118	54.1
	Mathematics	123	11	8.9
2000-2009	Social studies	123	100	81.3
	Science	182	90	49.5
	Mathematics	128	15	11.7

Source: MoE, 1982, 1983; 1989; MoEC, 1996; MoEVT, 2005/2006

Findings from the teachers and pupils on the extent of EE coverage across school subjects are presented in Tables 3 and 4 respectively.

Table 3 Subject Teachers' Ratings of Extent of EE Coverage in Primary School Curriculum by 2010

School Subjects	Teachers' ratings of EE coverage in school subjects (N=66)						
	Low		Moderate		High		Score category
	f	%	*f*	%	*f*	%	
Social Studies (after 2005)	4	6.1	50	80.3	9	13.6	Moderate
Science	2	3	5	7.6	59	89.3	High
Geography (before 2005)	5	7.6	8	12.1	53	80.3	High
Vocational skills	18	27.2	42	63.6	6	9.1	Moderate
Kiswahili	24	36.3	31	47	11	16.6	Moderate
English	20	30.3	32	48.5	14	21.2	Moderate
History (before 2005)	15	22.8	40	60.6	11	16.7	Moderate
Mathematics	51	67.3	7	10.6	8	12.1	Low

Source: Field survey, July - September 2013

The results in the table depict that most subject teachers indicated that Science and Geography were the subjects with the highest coverage of EE with 89.3% and 80.3%, respectively. It is evident that the rest of the school subjects were rated moderate while Mathematics was rated

lowest, with the least coverage of EE topics. The results indicate that the integration of EE in school subjects had not been done equally.

On the other hand, the responses by pupils on the extent of coverage of EE in school subjects revealed diverse opinions. The results indicated that the highest coverage of EE topics/sub-topics was in Social Studies, Geography and Science, with 88.9%, 70% and 61%, respectively. The results also indicated that EE was only moderately covered in other school subjects except Mathematics, where coverage was definitely low. Table 4 presents pupils' ratings of EE coverage in school subjects.

Table 4 Pupils' Ratings of EE Coverage in Primary School Subjects by 2010

School Subjects	Pupils' ratings of EE coverage in school subjects (N=235)							Score category
	Low		Moderate		High		Majority	
	f	%	*f*	%	*f*	%	Percentage	
Social Studies	10	4.3	16	6.8	209	88.9	88.9	High
Science	35	15.0	56	24.0	142	61.0	61.0	Moderate
Geography	35	15.0	35	15.0	164	70.0	70.0	High
Vocational skills	66	27.2	117	50.0	51	21.8	50.0	Moderate
Kiswahili	81	34.9	109	47.0	42	18.1	47.0	Moderate
History	54	23.2	108	46.3	71	30.5	46.3	Moderate
English	48	20.6	121	52.0	64	27.4	52.0	Moderate
Mathematics	156	67.5	51	22.1	24	10.4	67.5	Low

Source: Field survey, July - September 2013

The findings from the head teachers and academic masters/mistresses indicated diverse views on the coverage of EE topics across school subjects over different periods of curriculum change. Their views were put in two main categories. The first category of participants claimed that EE content was covered in all school subjects but with unequal weight. The second category of participants claimed that EE was covered only in certain subjects. The following extracts confirm this:

> It is easy to identify the topics and sub-topics relating to environmental education in Science, Social studies, Vocational skills and Geography. But the topics are not equally represented in school subjects, as for example, Mathematics has the least content of EE (teacher, school B^{Mo})[4].

The coverage of EE was also captured by the narrative of another participant:

> In a subject like geography almost all topics focus on environmental education. I found several issues relating to the environment including the importance of the environment and environmental issues at school, ward, division and national level, like soil erosion, land degradation, water, energy, pollution and deforestation. Other environmental issues I found in the subject include natural vegetation and natural resources (teacher, school F^{Ko}).

A similar view was given by another participant, who adds:

> ...In science, most of the topics are about the environment. As pupils begin learning science, especially in grade three, they learn about the cleanliness of their body and

[4]This, as all other subsequent statements quoted from interviews, has been translated from Kiswahili, which was the medium of interaction in the field.

> surroundings. To me this learning is concerned with environmental education because pupils need to know about various matters concerning cleanliness, diseases, water, agriculture, parts of the body, living and non-living things (teacher, school C^{Mo}).

Contrary to the views quoted above, some participants felt that EE was not represented in the subjects they taught. One participant is quoted saying:

> I have never seen environmental education topics in the subject I teach which is mathematics in Standards VI and VII. I find the content does not relate to environmental education. Sometimes we are told by the school inspectors to teach environmental education in all subjects, but when we study the syllabus we do not find that topic, and even when we look into the books we do not see it (teacher, school A^{Mo}).

In the light of the above statements, it appears that teachers believe that EE themes were incorporated in school subjects to varying degrees.

Furthermore, head teachers and academic masters/mistresses had similar claims that EE has been integrated in school subjects but is covered to varying degrees. In the following quotes, the participants offered their views on the coverage of EE topics across school subjects:

> I think Geography and Science teachers can teach the concepts of the environment, the human–nature relationship, landscapes, borders, agriculture, land uses, mining, energy, garbage classification, recycling, saving energy, personal hygiene and bodily cleanliness (Head teacher, school B^{Mo}).

The views expressed by the head teacher of school B in Moshi-rural were echoed by the head teacher of school C also in Moshi-rural:

> .... Certainly, over the past 10 years of curriculum change, I have been teaching environmental education in Geography. I think the topics are also available in other school subjects. I can point to issues relevant to environmental matters in Geography and Science but not in other subjects (Head teacher, School C^{Mo}).

The participants recognised that curriculum review has been instrumental in ensuring that EE has been introduced in school subjects. The following are the views of the participants.

> I suppose since 1996, when the new books for primary education were written to reflect the curriculum review by the TIE, the term 'environment' has appeared more frequently in subjects like Social studies and Geography (Head teacher, School A^{Mo}).

The conversation with the head teacher of school D in Kondoa revealed similar views. For example, the head teacher said:

> ....Well, more recently following the curriculum review of 2005, cross-cutting issues including environmental education were introduced in school subjects. However, it is not a stand-alone subject but is included in other subjects [like] 'Language' Geography, Science, Social studies and even in 'History'.(Head teacher, School D^{Ko}).

The foregoing quotations indicated that head teachers were well informed about the coverage of EE topics in school subjects. However, a few of them claimed that EE has never existed in the school curriculum because there were notrained teachers in specific subjects, little time available or no period allocated for it.

Nature and Organisation of Teaching-Learning Content

In line with the trends and developments with regard to EE in the school curricula, topics pertaining to it were gradually introduced in school curricula organised around key learning

areas using the multidisciplinary approach. The following subsections present the history of the developments and situations in intervals of ten years, further summarized in Table 5.

i. 1980-89

In this timeframe, the findings indicated a small beginning in the selection of environment-focused themes and topics, although their organisation and coordination, for most of this period, was somewhat inadequate. The topics were incorporated particularly in geography and science syllabi.

ii. 1990-99

The findings indicated that this period witnessed more efforts of great potential in terms of the content of EE in the school curriculum. Topics that emphasized the environment and humans' interaction with nature were included in the primary school geography and science curriculum and later the combined social studies.

Table 5 Nature and Organisation of EE in Schools, 1980 –2010

Period	Subjects	Representative/indicative EE content areas	No. of sub-topics in syllabus
1980–1989	Geography	(i) Weather (ii) Population size and density (iii) District developmental activities	132
	History	(i) Our culture (ii) Agricultural activities	10
	Civics	None	None
	Science	(i) Living things (ii) Soil (iii) Mining (iv) Diseases (v) Weather	129
	Mathematics	(i) Percentages (ii) Measurements (iii) Whole numbers	18
1990–1999	Social Studies	(i) Our earth (ii) Environment (iii) Landscapes	97
	Science	(i) Health and methods of disease prevention; (ii) Living things (iii) Environmental conservation	118
	Mathematics	(i) Whole numbers	11
2000–2009	Social Studies	(i) Environment (ii) Components of the environment (iii) Economic activities in E.A and their effects on environment (iv) Environmental degradation	100
	Mathematics	(i) Whole numbers	15
	Science	(i) Health and prevention of diseases (ii) Safety precautions in our environment	90

Source: School subject syllabi (1980 - 2009); MoE, 1982/3; 1989; MoEC, 1996; MoEVT, 2005

iii. 2000-2010

The findings indicate that this period was the most active, illustrative and promising in terms of EE content. This was noted in the 2005/6 curriculum change which, at first glance, seemed

to be an extension of many topics of the 1996 curriculum. Possibly the reforms were part of the adaptation process associated with the government's formulation of the national environmental policy (NEP) of 1997, which drew attention to key environmental problems facing the country which required urgent attention. This new primary school curriculum (Standards 1-7) placed greater emphasis on the environment, which was accepted as one of the broad dimensions in all school subjects. Even then, topics relating to the environment were not introduced at the same level in school subjects.

Overall, the nature and organization of the content in the curriculum from 1980 to 2010 did not adequately help pupils understand the interdependence of all life forms, including the dependence of human life on the resources of the planet or on a healthy planet. This implies the lack of critical EE content that needs to be logical and sequential, aimed at addressing issues in context and reflecting the social, economic, political, technological and ecological aspects of the environment. This suggests that EE topics/sub-topics need to be prescribed in the syllabus that are relevant to the context as well as historical, ethical, cultural, geographic, economic and socio-political relationships. Unfortunately, the EE content in the primary school curriculum throughout the period of curriculum change was developed with little regard for these important considerations, thus predictably reducing the effective teaching of it in schools.

Teaching approaches and methods

The findings indicate that the approaches and methods used in the teaching and learning of EE in school subjects, as documented in the syllabi from 1980-2010, and actual teaching of it, reflected a diversity, depending on the topics and sub-topics contained in a particular subject. The findings indicated that several approaches/methods were used to enhance the teaching and learning of school subjects irrespective of EE themes. The findings in Table 5 indicate various approaches and methods used to teach EE.

i. 1980-89

The findings show that several approaches were documented in the syllabus, for the general teaching of school subjects but with no specification or prescription of the methods or techniques for teaching EE topics and sub-topics. This means that EE methods were not delineated in the syllabi focusing specifically on teaching EE topics/sub-topics.

ii. 1990-99

As for the decade of 1990-99, analysis of the syllabus indicated that methods for teaching school subjects ranged from those that seemed to be more participatory to others that were less participatory. However, it was noted that no specific prescription was found for teaching EE topics/sub-topics; but was left up to the teachers of the subjects concerned to include them.

iii. 2000-2010

This period witnessed a major shift from the content-based curriculum to competency-based methods, following the curriculum change of 2005/6. Approaches and methods in this timeframe reflected a more constructivist orientation to teaching and learning, which encouraged more active learning. In particular, active and relevant methods for teaching EE topics/ sub-topics were reflected more in Social studies and Science. This was further reinforced by the provision of *Guidelines* for integrating EE in school subjects (MoEVT, 2006), indicating how different methods could be enhanced for the effective teaching of EE topics/sub-topics.

The findings from interviews show that teachers employed less participatory approaches because they were more concerned with covering the syllabus and not wasting time on "too

much discussion or investigation". The findings from the teachers generally indicated that it was difficult to identify and isolate the topics, claiming that the process was almost equivalent to teaching two different subjects at the same time. They indicated that selecting teaching methods specifically for environment-related topics was too much work for teachers. The findings on teaching methods and approaches are presented in Table 6.

Table 6 Some Content areas and EE Teaching Methods in Schools, 1980 –2010

Period	Subjects	Representative/indicative EE content areas	No. of sub-topics in syllabus	Documented EE Teaching Methods/Approaches
1980–1989	Geography	(iv) Weather (v) Population size and density (vi) District developmental activities	132	Study tours, and discovery; Sample study, imagination tours, drama and discussions, questions and answers; Projects.
	History	(iii) Our culture (iv) Agricultural activities	10	Study tours, drama, songs, narratives, oral traditions, guest speaker, discussions, questions and answers.
	Civics	None	None	None
	Science	(vi) Living things (vii) Soil (viii) Mining (ix) Diseases (x) Weather	129	Field practicals – discovery, study tours; Discussions, questions and answers Guest speaker Experimentation, group work
	Mathematics	(iv) Percentages (v) Measurements (vi) Whole numbers	18	Discussions, questions and answers, with the use of real objects and pictures.
1990–1999	Social Studies	(iv) Our earth (v) Environment (vi) Landscapes	97	Pictures/posters, study tours, discussions, questions answers, discovery, songs, drama and guest speaker.
	Science	(iv) Health and methods of disease prevention; (v) Living things (vi) Environmental conservation	118	Practicals, discussions, guest speaker, project, experiment, questions and answers, study tours and posters, brainstorming and demonstrations.
	Mathematics	(ii) Whole numbers	11	Discussions, questions and answers.
2000–2009	Social Studies	(v) Environment (vi) Components of the environment (vii) Economic activities in E.A and their effects on environment (viii) Environmental degradation	100	Real environment, real objects, pictures/ posters showing depleted/destroyed areas, study tours, discussions, demonstrations, group discussions, questions and answers as well guest speaker
	Mathematics	(ii) Whole numbers	15	Discussions, questions and answers, demonstrations, posters and pictures

	Science	(iii) Health and prevention of diseases (iv) Safety precautions in our environment	90	• Practicals and experimentation, demonstrations discussions, • Projects, guest speakers; • posters; questions and answers • narratives; study tours,

Source: School subject syllabi (1980 - 2009); MoE, 1982/3; 1989; MoEC, 1996; MoEVT, 2005

Relevance of EE in addressing environmental issues

The findings indicate that apart from the "theoretical" statements in the documents indicated in the MoEVT *Guidelines* of 2006 and syallabi, interpretation and application in the field seem to have been different. Data from the questionnaires revealed that the majority of subject teachers (73.3%) indicated that EE content was not relevant in addressing local environmental issues and challenges. Only 22.7% of the respondents indicated that EE content was relevant. Figure 1 depicts teachers' opinions on the relevance of EE content in the national curriculum against actual implementation in respect of local environmental issues.

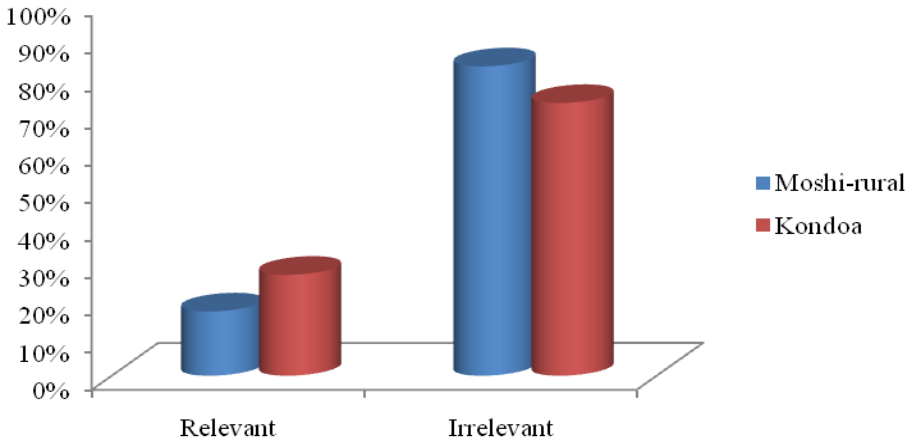

Figure 1. Teachers' ratings of relevance of EE in addressing local environmental issues

For the most part, subject teachers in the study considered EE themes in the syllabi irrelevant to addressing local environmental issues. This view was shared by the teachers in both districts, with those in Moshi-rural (82.8%) being slightly more emphatic than those in Kondoa (73%). The teachers in Moshi-rural considered the EE curriculum provision particularly irrelevant, given the actual problems and issues in the local community that need practical solutions, such as deliberate bush fires around Mt Kilimanjaro, population density and congestion that preventsthe expansion of cultivation, as well as deforestation and an increasingly unreliable rainfall.

Corroborating findings from the interviews with head teachers and academic masters/mistresses indicated that the content of EE was designed within a wide national framework of concepts and terms of reference which gave little or no consideration to unique circumstances or how EE could be adapted to the local situation. The head teacher from school B in Moshi-rural said:

> The subject syllabi were the principal guiding documents for teaching and learning processes in schools. The environmental education we teach must bederived directly from the syllabus, otherwise you will be wasting your time teaching things that will not

> appear in the examinations. We adhere to the content indicated in the national syllabi; otherwise the school inspectors would reprimand us.

Another head teacher asserted that:

> Of course it has to be the syllabus, which is the only approved guideline for teaching in schools….So we just follow it nationally without recourse to local circumstances or variations.

This view was supported by yet another head teacher:

> I think relevant content makes all people, pupils and teachers sensitive to issues concerning the balance of nature and to the better management of nature, and makes pupils sensitive so that they know how to manage nature, linking the knowledge they acquire at school and their respective homes.

> This content was supposed to ensure ways of protecting the environment and educating young people to understand that the environment and people must co-exist. Environmental education should become a way of living, in the school and the community, to ensure everyone is aware of the common challenges facing the environment.

In the light of these and several other unquoted exchanges, the participants acknowledged the need to link theory and practice concerning real environmental issues in order to make EE relevant. Generally, the analysed curricula documents give the minimum standards and expectations with regard to EE for schools but, unfortunately, give little practical guidance on contextual implementation.

Discussion

This study sought to evaluate the historical implementation of Tanzania's primary school EE curriculum, focusing on the extent of content coverage, the nature and organisation of topics, teaching and learning methods and approaches and the relevance of EE in addressing local environmental issues. The findings confirmed the use of the integrated/cross-curricular approach and emphasized that EE was coveredinmost subjects. Geography, the later combined Social studies and Science were found to have more EE content than other subjects. Mathematics was found to have very few EE topics. This study contends that this type of distribution and integration of EE in the curriculum raises misconceptions amongst pupils as most of them think that environmental issues are more related to some subjects, so that its cross-cutting nature to other fields is reduced, while at the same time subject content is overcrowded. The result is inefficiency,low morale and the lack of interest and motivation for teaching and learning by both teachers and pupils.

Furthermore, the study contends that while most of the participants seemed to be aware of the coverage of EE topics/sub-topics in school subjects, it was nevertheless evident that other participants were not, which reflects varying levels of implementing EE. It is evident from the study that this type of coverage of EE topics and sub-topics across different school subjects over different periods of curriculum review and change raises misconceptions amongst teachers and pupils. This is because most of them recognise that environmental issues and concerns relate more to Geography/Social studies and Science but not very much to other subjects, thereby reducing its cross-cutting nature.

Therefore, there is a need for a more explicit and analytical statement on the implementation of EE since,on the ground, little was observed concerningthis in the school curriculum. EE in Tanzanian primary schools is still far from being institutionalised as a fundamental, mandated and sustained part of the education system. The results from this study are similar to findings from earlier studies done in Nigeria (Adebayo & Olawepo, 1997), New Zealand (Flaws & Meredith, 2007), Jamaica (Ferguson, 2008), Kenya (Odeke, 2009) and Namibia (Haindongo, 2013).

The findings indicated that EE exists as topics and sub-topics integrated in school subjects with a varying level of inclusion. This indicates clearly that the approach would work best in promoting environmental literacy when it is infused across the curriculum as opposed to being treated as a separate subject (UNESCO/UNEP, 1976; NAAEE, 2010). There is the increased likelihood that pupils would incorporate learning about the environment in their working knowledge of the world of their context if well designed. This idea has been supported by Hungerford & Volk (2005) that integrating EE in other subjects provides more opportunities to reinforce environmental learning over a substantial amount of time, increasing environmental literacy and encouraging responsible environmental behaviour.

The study also indicated some challenges in implementing EE using the multidisciplinary approach. This concurs with various studies (Palmer, 1998; Drake, 2004; Mappin & Johnson, 2005; McClaren & Hammond, 2005) that have demonstrated that integrating EE in different subjects creates several challenges to education systems. They argued that when EE is integrated in the content of school subjects, pupils fail to develop a clear understanding of what different disciplines or forms of knowledge contribute to an understanding of an environmental topic. In addition, teachers find it difficult to link EE content with some subjects because there seems to be no clear connection.

The implementation of EE in Tanzanian primary schools would have been best applied using the holistic approach to the curriculum, which would permit a number of approaches to teaching because primary education is very flexible and could employ holistic/multiple approaches effectively. Scott and Oulton (1999) proposed multiple approaches with the involvement of various EE practitioners, including teachers, pupils, managers, researchers and people from the community. This has not been the case of EE in Tanzania because it has not been approached in the same way. Such approaches could achieve clearly identified goals suited to the social, cultural, political and philosophical contexts in which education takes place. The findings of the study are in line with previous studies (Makundi, 2003; Ndeskoi, 2007; Haindongo, 2013; Peter & Cheruto, 2013), which established that the EE curriculum lacked a link to real environmental issues at the local level. The findings suggest that deliberate efforts would have to be made to establish a link with local environmental problems in order for the subject to have a lasting impact on the pupils.Generally, the study confirms that the implemented EE curriculum puts more emphasis on teaching about the environment but to a lesser extent as education in the environment and education for the environment, thus making it irrelevant to the intended goal.

Conclusion and recommendations

The implementation of EE in Tanzania's primary schools, via a multidisciplinary approach over different periods of curriculum adaptation (1980s-2010), did not achieve much in addressing the environmental issues, challenges and problems facing the country. The content and way of teaching EE in schools was largely determined and guided by the subject syllabi, which unfortunately, did not substantially conform to the objectives and guiding principles of EE as

originally stipulated. Consequently, this raises doubts about the adequacy of the subject syllabi in addressing the relevant issues and appropriate approaches to curriculum innovation. This is because successful implementation of an innovative and holistic subject in EE requires that attention be given to setting up a system that involves the local community, taking into account the transformative nature of EE. It also requires introducing the use of indigenous knowledge sources in order to inculcate a sense of ownership and cooperation with surrounding communities. The ideal implementation of EE requires a systemic change in the values of the education system, which needs to move away from being examination-driven, as is currently the case, towards being a wider, more critical, creative and innovative base of knowledge.

The study recommends that MoEVT should train teachers about the nature and implications of curriculum change with regard to environmental education in their teaching location. The teacher training programme (whether PRESET or INSET) ought to spell out specific curricular aspects and themes concerning the environment, with which teachers could engage their pupils while at the same time putting them into contact with adults in the surrounding community with whom they could dialogue. It also recommends an immediate review of Tanzania's primary school curriculum to include adequate, relevant and practically oriented EE content, thus arguing for the design of curricula oriented to solving problems as a suitable approach to the provision of EE.

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