



### Keywords

Environmental Education,  
Community's Sustainability,  
Environmental Sustainability,  
Environment,  
Uganda

Received: December 2, 2017

Accepted: December 11, 2017

Published: January 8, 2018

# Sustainable Environmental Education Is a Panacea for Community's Sustainability in Uganda

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### Citation

Oluwole Olusegun Akiyode, Katongole Hadijjah, Anne Tumushabe. Sustainable Environmental Education Is a Panacea for Community's Sustainability in Uganda. *American Journal of Environmental Policy and Management*. Vol. 4, No. 1, 2018, pp. 1-8.

### Abstract

The continuous rapid technological advancement of the world with its socio-industrial advancements is indispensable for the present age, but its attendant consequences need knowledge, awareness, environmental behaviour, development of sustainable policies and consistent community action to encourage human and environmental sustainability. Also, natural disasters such as earthquakes, floods, and landslides occur unexpectedly in different parts of the world. Hence, the sustainable management of all environmental concerns in a community will require the understanding of the same, sustainable actions and sometimes community's preparedness. Therefore, these make sustainable environmental education crucial for every society. This study aims to analyze the importance of sustainable environmental education for community's sustainability and advancement in Uganda. It reviews the literature on environmental education for sustainable development on the basis of communicating the definition of environmental education and its objectives in the Tbilisi Declaration of 1977. The study examines the challenges of the environment in Uganda linking them to the need of sustainable environmental education that will support human environment, livelihood sustainability, environmental sustainability and community sustainability.

## 1. Introduction

Education for Sustainable Development is essential for human and environmental sustainability in this present day. It's also crucial to the sustenance of the rapid technological advancement of the world and may be indispensable in ameliorating and mitigating the negative consequences of globalization, socio-industrial change and development. Thus, the United Nations (UN) declaration of the years 2005 to 2014 through the Resolution 57/254 of December 2002 as the 'Decade of Education for Sustainable Development' [1]. This UN declaration may be indispensable in this new century to encourage the increase of knowledge, information, and learnings that will support the preservation of the world from the adverse implications of growing advancements in science and technology and hearten the sustenance and enjoyment of the benefits of growing developments by man.

Most of the definitions of environmental education have their foundation in the Tbilisi Intergovernmental Conference on Environmental Education organized by United Nations

Education, Scientific and Cultural Organization (UNESCO) and United Nations Environmental Programme (UNEP) in 1977 which is referred to as Tbilisi Declaration. Environmental education is the acquisition of knowledge about the environment in order to encourage human beings to manage their surrounding in a sustainable manner that will support future existence. It could also be seen as an education that attempts to increase people's awareness of their environment and the outcome of human activities towards the environment [2]. It allows individuals to discover environmental issues thereby engaging in problem-solving, and further take action to improve the environment [3].

Environmental Education could also be expressed as a learning process that is expected to increase peoples understanding and awareness about our environment and its associated challenges thereby developing the necessary skills and expertise to tackle the challenges with the aim of fostering attitudes, motivation and commitments that will make informed decisions and take accountable action [4, 5]. The Tbilisi declaration advocates the objectives of environmental education as awareness, knowledge, attitudes, skills, and participation [4], which are the integral and focal point of most of its definitions.

The main objective of environmental education is people's active participation in working towards the cure of environmental problems which is multifaceted [6] Thereby, environmental attitudes, behaviours, and actions are expected to be influenced by environmental awareness and knowledge. Thereby, environmental education is apparently indispensable in the development of positive attitude to the sustainable management of the environment.

In Sub-Saharan Africa, only very few countries are placing little attention on environmental education. Environmental education has the potential of granting knowledge that will support actions that will encourage sustainable interventions to environmental concerns. It contributes to the disaster risk reduction (DRR) strategy thereby making man to understand the nature of hazards in its society and how to exempt from it and sometimes cope with them [7]. Hence, environmental education is expected to encourage environmental conservation and sustainable development. Though, empirical studies relating to the costs and benefits of diverse forms of education in the areas of environmental conservation and sustainable development is limited now, but there is a need for urgent critical assessment these procedures in order to fine-tune policies that will encourage environmental education [8]. On this note, this study assesses the level of environmental education in Uganda "vis-à-vis" the environmental challenges common to the country. It examines the evolution of environmental education relating it to Uganda's governmental policies on environmental sustainability. In the end, it expounds the roles of environmental education as a driver of environmental attitudinal change that will support a durable community sustainability.

## 2. Methodology

The study reviews the literature on environmental education on the basis of communicating the definition of environmental education and its objectives in the Tbilisi Declaration of 1977. It further identifies through historical analysis the issues and challenges of the environment in Uganda and relates them to the need of sustainable environmental education that will encourage sustainable community.

## 3. Environmental Education as a Propellant of Knowledge

Education is important for technological advancements and socioeconomic development of the world. It is also essential for the improvement of community's strategies in the sustainable management of negative consequences associated with every development. The concerns mostly created by the technological advancements, natural resource exploitation and unsustainable management of nature given resources in different phases of lives at some of the times yield negative consequences that are globally common to man and its environments such as climate change and environmental insecurity.

These negative implications from technological advancements may need knowledge of the development and its environment to generate actions that will encourage environmental sustainability. Though, there are inherent difficulties in demonstrating a causal relationship rather than an association between receiving environmental education and ensuing changes in knowledge levels, attitudes or behaviours [9]. However, it has been difficult to draw a conclusion concerning the relationship between environmental education, knowledge and individual action [10].

Nevertheless, the ultimate goal of environmental education everywhere in the world is to boost knowledge that will encourage actions that will foster a better environment, preventing environmental damage and encourage human livelihood and community sustainability. Though, studies world over has not been able to agree on the mode and effective way of inculcating environmental education that will yield expected knowledge and attitude that will encourage environmental actions for sustainable communities [10, 11, 12].

Generally, children, environmental education has always been given the nod because children are the future of tomorrow and once an attitude is instilled in them, it may not be easily changed [10, 13]. Also, there is yet to be a conclusive information that the child-orientated environmental education may influence adult knowledge and eventually the behaviour of the household [10]. Therefore, we may not override the pertinent understanding of the

parents' attitude influencing the children environmental attitude though intergenerational transmission of antecedents of environmental attitude may be limited [14].

Pe'er, Goldman and Yavetz (2007) in a research study on the assessment of environmental knowledge, attitude and behavior of beginning students in teacher training colleges in Israel found a significant positive relationship between the level of the students' mothers' education and the environmental knowledge and environmental attitude of students [15].

A Study published by Damerell et al. (2013) compared children on wetlands lessons to the one, not on the lessons suggested that education is a major foundation of environmental knowledge for children [10]. The study further realized that parents having children that had gone through wetlands lessons had significantly higher knowledge in wetlands without perceiving it than the parents whose children were not on wetlands courses [10]. The study further confirmed the assertion of Vaughan et. al. (2003) who demonstrated through a pre-test, post-test methodology that Costa Rican school children taught a one month lesson on the natural history and conservation of scarlet macaws (*Ara macao*) improved on 71% of test questions related to the taught subject matter and the knowledge learnt by the children from the lesson learnt were transmitted to the parents and neighbours [11, 16, 17].

Other methods of education though may not be formal training or lessons might create an understanding which could always support environmental attitudes and actions. This is because human values of its environment may be sensitized through this training which may inspire the understanding of the need for environmental preservation in order to support the societal values for now and the future. For example posters, stickers videos, theatrical presentation and workshops were used in a study in the Union of the Comoros to demonstrate the benefit to human beings of the ecosystem services provided by the critically endangered fruit bats in which the study analysis showed an increased in the knowledge of the bats in their seed dispersal roles which led to among others the development of policy and legislation and increased conservation [18].

Also, informal environmental education or learning may be outside formal or school classrooms setting such as include research in museums, botanical gardens, zoos and field centers, etc. are prime to building up of attitudes and corresponding environmental action [19]. This helps learners to see the proofs and effects of environmental degradation and mismanagement thereby exploring and develop their personal environmental knowledge, awareness, skills, attitudes, behaviours, and beliefs [19, 20]. Therefore, the need of environmental education cannot be overemphasized for instilling and nurturing of conservation attitudes expected to encourage environmental protection and sustainable communities through workable and supportive environmental actions that will be created and generated by the understanding of our immediate environment.

For example, a study utilizing informal training in Florida

peninsula published in 2002 with the aim of conservation of manatees in the water of the Tampa Bay Florida peninsula where boat collisions with manatees were accounting for about one-quarter of the death of manatees annually expresses a correlation between attitudes and environmental education [21]. The study found the boaters indicating supports for environmental education than stringent policy such as speed and wake limits, increased patrol and no entry areas because the boaters have acquired knowledge of conservation, thereby becoming more sensitive and supportive to environmental protection [21].

In Uganda which is our case for this study, the scientists and educators at Disney's Animal Kingdoms since 2004 have been working with National Forestry Authority of Uganda, Ugandan Ministry of Education and Sports and Goodall Institute, Uganda on the Kalinzu Forest Reserve (KFR) in the Bushenyi district in Western Uganda to relate knowledge of environmental education to the issues of environmental conservation and sustainability.

Kalinzu Forest Reserve in Bushenyi district in western Uganda has been noted for inhabiting six primate species which include black and white *Colobus* monkeys, Chimpanzees and Olive Baboons. In the recent study which is a follow-up evaluation of data gotten through comparing performance from primary five students in fourteen schools outside Kalinzu Forest Reserve for thirty days, one year and two years after initial engagements on environmental education, the study demonstrated that knowledge gained in the program is not transient [22]. The researchers further affirmed that people cannot exhibit environmental responsibility behavior without adequate understanding and information about their environment and that the first step in reducing the impact of humans on the environment is to provide them with adequate information of the same though knowledge may not guarantee appropriate environmental behaviours [22].

#### **4. Environmental Education as a Booster for Awareness**

Environmental education is expected to boost learners' awareness in order to make them sensitive towards the environment and its resources thereby driving them to take the corresponding action towards environmental preservation and conservation in their communities. Though, this study agrees with Blumstein and Saylan that there has not been good data on the level public awareness and knowledge of environmental issues pertaining to preservation and conservation of environment [23].

Nevertheless, there has been increased legislation and policies that are expected to forestall growing environmental degradation in different parts of the world. However, some of the studies conducted world over on the impact of environmental education on learners' attitudes and practices have shown progressive and promising stake towards justifiable environmental attitudinal change which always

yields corresponding actions that will encourage preservation and conservation of the environment.

For example in New Zealand where a national research project examined the implications of implementation of curriculum innovation on environmental education by way of guidelines document rather than a compulsory curriculum statement, the study identifies the main student outcomes which were 91 percent of the 235 respondents were the achievement of understanding, knowledge, and awareness about the environment [24]. The study also establishes that about 61 percent of the respondents developed attitudes and values towards the environment but less than 30 percent of the respondents eventually took actions for the environment

Environmental knowledge and awareness are indispensable to sensitizing residents of every community to accept a sustainable environmental policy that is expected to bring about enduring sustainable community. In a study conducted in India on a willingness to pay for improved waste management in Silchar Municipal Area in Cachar District, Assam, India, it was suggested by the researchers that willingness to pay by the household heads has a corresponding relationship to the level of formal education of the household heads [25]. This was based on the understanding that the level of formal education of the societies determines the level of the knowledge and awareness of the society's environmental issues and consequences and the needs to remedy them.

In a like-minded research study carried out in Gorka municipality in Nepal, it was realized that the household head was statistically at 5 percent level having a positive coefficient with environmental awareness variable of a positive coefficient with statistical significant at 1 percent which depicts that the household heads support a willingness to pay for improved waste collection service because of his/her awareness of the adverse implications of waste on the environment [26]. Hence, the total years of formal education accomplished by the household heads in the two localities (Assam in India and Gorka in Nepal) had a positive influence on the households' willingness to pay for improved waste collection services at the time the studies. Thereby, from this two studies above, it could be seen that the increase in the level of environmental awareness by the people in a community may encourage the appreciation and need for sustainable environmental management in the society.

Also, awareness created through information is sometimes a veritable key to households' willingness to pay for electricity. In a study where the researcher utilizes a contingent valuation method (CVM) in relating information to valuations of electricity in the United Kingdom, the researcher finds that information has effects on the valuation of electricity [27]. In a likewise study in Ghana linking improvement of electricity supply to a willingness to pay, it regarded secondary and tertiary levels of education as significant factors that influences households willingness to pay for improved electricity [28].

## 5. Evolution of Environmental Education in Uganda

The UNESCO implemented 'Basic Education Integrated into Rural Development (BEIRD) project at Namutamba Primary Teachers College in 1970 could be regarded as the origin of environmental education in Uganda and was intended to integrate students with their physical and biological environments according to the assessment report of the Intergovernmental Authority for Development (IGAD) [29]. Thereby, environmental science or science of nature was formally taught to pupils and students in schools in Uganda. Nevertheless, there was a new dawn and refocusing when the National Environment Action Planning (NEAP) originated in Uganda in the early 1980s through World Conservation (IUCN) visitation to Uganda to propose National Conservation Strategy (NCS) [30]. Moreover, the process development for National Environment Action Planning (NEAP) in Uganda began in 1991 [30]. This further enlivens the country with the needs for environmental conservation, protection, consciousness, and also pushes for the needs for sustainable policies and Acts that will encourage environmental management and community sustainability.

Also, the Agenda 21 of the 1992 United Nations Conference on Environment and Development (UNCED) which was an agreement of the Rio Brazil Global conference was a veritable thrust that supported and encouraged the needs for a more focused, firmed and progressive environmental management procedures and environmental education packages in different parts of the world which include Uganda. Agenda 21 further heartened the initiation of the national policy for the sustainable management of the environment in the country through the promulgation of a statute called the National Environmental Management Statute No 4 of 1995. Also, Johannesburg World Summit on Sustainable Development in 2002 further boosted the need of environmental education for citizenry for it highlighted the need of knowledge and awareness as a veritable key in the plan for the achievement of sustainable development [31, 32].

Thereby from 1995, Uganda continued to enact Acts and laws that support the growth of environmental management and environmental education in the country. Some of the sustainable environmental management laws enacted in Uganda include "The National Environmental Act, Cap 153 of May 1995 which parts of its policy thrust included the promotion of public awareness through formal, non-formal and informal types of education on issues pertaining to the environment and ensures that environmental awareness should be in the integral parts of education [33]. While "The National Forestry and Tree Planting Act, 2003 in its policy thrust also support the facilitation of greater public awareness of the cultural, economic, and social benefits increasing and conserving sustainable cover [34]. Other environmental inclined policies of the country including Water Act, Wildlife Act, and the Local Government Act, etc. [35]. All these are supportive of a sustainable environmental management of the

country's environmental concerns

Though in Uganda at present, the involvement of learners to issues of ecological sustainability, social justice and good governance in primary and secondary school could be regarded as poor [36]. Nevertheless, most of the tertiary institutions in Uganda have laudable environmental protection and management courses for the development of environmental professionals, researchers, and practitioners that will encourage human, society and community sustainability. Though, the process of informal education is currently slow but has continued to generate positive implications in developing environmental behaviours and actions at different levels.

Though, there has been a proliferation of non-governmental organizations (NGO) on environmental concerns and growth and supports from international non-governmental Organization (INGO) in different parts of the country with the scope for conservation and environmental protection. The participation of these organizations in different levels have informally continued to engage and build the citizenry and community's environmental knowledge and awareness in different areas depending on the focus and intent of the organization.

## 6. Environmental Issues in Uganda

Uganda has its own environmental challenges that will always require sustainable management in order to preserve the future. The management of this challenges demands awareness, knowledge, attitudes, skills, and participation which are the basis of sustainable environmental education that is necessary for community sustainability. However, most of the present day environmental challenges in the country are due to lack of understanding of some of the ecological facts of life necessary for sustainable processes [37]. Thereby, this makes the need for environmental education and awareness to be indispensable to the community and societal sustainability and growth. Some of the notable challenges may need a proactive environmental education that will create citizenry's knowledge, awareness and attitude. These include the understanding of the processes of sustainable solid waste management, the implications of water insecurity, the consequences of deforestation to the society, the need for preservation of biodiversity and the understanding of risks associated with natural disasters and its management, etc.

### 6.1. Knowledge and Natural Disaster in Uganda

Public knowledge, understanding, attitudes, skills, and participation is always essential for the effective management of the natural disasters. History points to Uganda as a seismic hazard-prone country because several seismic activities at a different time in the country resulted in earthquakes and tremors which have quite not been too fatal. Uganda's most hazardous earthquake occurred on March 20, 1966, in Toro leading to the death of about 150 people and injured 1,300

[38]. Some of the recent earthquakes in Uganda include the 5.7 magnitude earthquake that shook different parts of the country which include the capital city Kampala on 10<sup>th</sup> September 2016 [39]. Also, there was an earthquake with a magnitude of 5.3 with epicenter at Kilembe in Kasese District around Lake Edward region in Western Uganda in July 2017 [40]. Three tremors shook Uganda in July 2013 which according to the European Mediterranean Seismological Centre (EMSC) was of a magnitude of 5.7 and classified dangerous [41].

Nevertheless, Knowledge of disaster, risk, management, and reduction is still at the teething stage for the majority of the public. Thereby, the majority of the citizenry may not have the understanding of what to be done in case of any dangerous or hazardous seismic occurrence. Also, most buildings and constructions in many parts of the country are not putting into consideration the seismic nature of the country when conceiving, designing and drawing the plans.

Also, landslides like earthquakes is a natural occurrence or disaster whose implication at most of the times is fatal. Some parts of Uganda are susceptible to landslides. Most of the landslides in Uganda are precipitated by torrential rains which are accompanied by floods. This is common to the mountainous or hilly side of Eastern Uganda around Mt Elgon Region. In June 2012, landslide induced by torrential rain buried three villages in Bududa district of the region killing over four hundred persons and displaced five thousand people [42, 43]. The havoc caused by landslides continue unabated in the Mt Elgon region of Uganda. In the recent times precisely August in 2017, three villages were destroyed by a landslide in Bulcheke Sub-County of Bududa district of the region which led to the displacement of about 200 families [44]. While seven people were also buried by a mudslide in Bufupa parish in Masaba Sub-County in Sironko [45].

As mentioned earlier, public knowledge and understanding of natural disaster are paramount to its management. Public understanding and knowledge of the hazardous nature of landfills may enhance decision for the relocation of some of the villagers from the mountainous and hilly sides of Uganda without them minding their ancestral homes as suggested severally by Uganda's government.

Also, the development of coping strategies for the villagers that still consider staying in this risky areas without minding the danger of any eventful natural disaster may be essentially adopted through knowledge, understanding, and awareness of research suggested coping approaches. Osuret et al. (2016) in a study conducted through focus group discussion in three districts in Bududa, Manafwa, and Butalejja suggested the adoption of good farming methods, indigenous weather forecasting, and preparedness as part of the coping strategies in the Mt Elgon landslide-prone areas [46].

### 6.2. Knowledge, Preservation, and Conservation of Communities in Uganda

Uganda as a nation is rich in biodiversity which the knowledge and needs of their preservation and conservation

are essential for their sustainability. Uganda has a history of biodiversity conservation since the colonial period under the British in the twentieth century which has been sustained till now. Uganda has conservation and protected areas in different parts of the country areas harbouring endangered species which has encouraged tourism that has been a boost to the country's economy. Though the Uganda laws forbid anyone to reside and practice farming or agriculture in the conservation and protected areas, there has been a widespread violation to the statutes and policy of the government initiated for preservation and conservation of some of the areas.

The country biodiversity is embodied in a system having ten national parks, ten wildlife reserves, and seven hundred and ten forest reserves, covering 33,000 km<sup>2</sup> (14 percent) of the country's surface area [47]. This wildlife reserves and national parks constitute the larger part (averaging 1074 km<sup>2</sup>), whereas forest reserves are lesser and quite widely spread (710 sites, averaging 21 km<sup>2</sup>) [47]. This biodiversity is concentrated in the tropical rain forests.

The forest in Uganda has continued to reduce due to industrialization, development and continued use (loss of tree cover is mostly due to demand for timber, charcoal and fuel wood) without sustainable process of afforestation and development. The standing biomass of most of Uganda's ecosystems has been declining with the exception of the larger protected forest which is mostly forest reserves and national parks [48]. From the data of the World Bank-International Development Association (IDA) of 2016, the forest area (percentage of land area) was approximately 23.78 percent in 1990, approximately 19.36 percent in 2000, 13.73 percent in 2010 and 10.36 percent in 2015 [49].

### **6.3. Knowledge, Management of Human Induced Challenges in Uganda's Communities**

Solid waste management has been a challenge in many developing economy urban and peri-urban communities. This is also common to urban centers in Uganda. Uganda still practices mixed waste collection and disposal. Sorting and practice of waste minimization strategies such as source reduction, re-use and recycle are still not yet acceptable to most of the citizenry. Also, there has been a continuous increase in waste and sewage generation in Uganda urban centers because of rapid urbanization being witnessed in many of the urban centers. Uganda is confronted with the rapid urbanization of 5.1 percent per annum and increasing population of 3.3 percentage with the growth of slums and informal settlements [50, 51, 52].

However, the solid waste generated in most of the urban centers such as Kampala city overwhelms the capacity for its collection and disposal [51, 53]. Also, a mechanism to sort and handle potentially hazardous waste from the mixed waste has been lacking in the waste management mechanisms [54]. The hazardous waste in the waste stream getting to disposal site may be deleterious to underground water in case of leaching. Thus, urban citizenry knowledge and awareness of

the needs to sort waste from the source and waste minimization mechanism will be contributory to the effective management of solid waste in the urban centers in Uganda.

## **7. Conclusion**

The study aligns with the notion that environmental education is essential for the development of environmental behaviours. Thereby, it affirms that every nation, including Uganda, will need to encourage sustainable environmental education through sustainable policies, formal and informal knowledge that will build approaches, inspire environmental behaviour that may aid the achievements of community sustainability.

Thus, the formal education curriculum in primary, secondary and tertiary institutions may need to be enriched with more local content. That is, with more of the issues that are common to the country. Formal environmental education is prime in building knowledge and awareness. Also, the informal methodology of education needs to focus on the nations and its regional environmental challenges.

The Government of Uganda should take the lead in creating the community's knowledge, awareness, and preparedness in disaster risk reduction. Uganda's past seismic activities and nature make her vulnerable to earthquakes. It had also witnessed landslides and floods in some of its communities in the recent pasts. Thus, the disaster risk reduction education and approaches should also be supported by the non-governmental organization (NGO) and the international non-governmental organization (INGO). The Government of Uganda will need to be firm in the implementation of sustainable environmental policies and be strict in the enforcement of sustainable environmental laws and statutes, through which knowledge and awareness of environmental issues in the communities can be enhanced.

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