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An Ecocritical Assessment of Environmental Representation in Burundi's Secondary School English Curriculum

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Abstract

This study examined the place that the English curriculum of the Secondary school in Burundi reserves to the teaching of the values of nature conservation, environment protection and climate change to educate learners about the importance of environment to advance humanity. It identified key environmental issues that should constitute the English curricula from the Middle School to the Upper Secondary to impart learners' significant knowledge on the preservation of nature and environment to fight against natural disasters and climate change. The collection of data consisted in a selection of themes on environment and the related reading texts suggested in the English textbooks designed for the four "tracks" under study. These tracks were: Sciences Track, Languages Track, Pedagogical Track and the Middle school that was regarded too as an additional Track to the study. Only themes that discuss nature conservation, environmental issues and climate

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change where they selected to constitute the essential data for analysis. In the end, the study remarked that contents related to environmental issues have been neglected while designing the contents. Only 16.4% of the contents discuss matters related to nature and environment. They are profoundly lacunar and limited to empower learners with significant ethical knowledge about the protection and advancement of nature and environment. Even the environmental themes provided in the textbooks treat superficial issues that give little knowledge about the contemporary acute natural threats. However, the study noted that a new technical vocabulary emerges from the themes to upgrade learners' communicative competences in English. In the end, the study establishes a list of topical subjects that should be integrated into the English curriculum to update pedagogical contents to reach a sustainable environmental education.

Introduction

In any field of learning, education is a process. It starts softly with the basic knowledge that will evolve progressively to set up a solid foundation that shall take the learner to a higher stage of knowledge after a considerable period of learning. *Ecology, nature and environment* are concepts that are unfamiliar in the realm of early learning in many educational systems across the globe. In his treatise on the relation between literature and ecology, Glotfelty (2002) argues that "ecocriticism is the study of the relationship between literature and the physical environment" (p.65). Nature and environment have been feeding literature and arts for ages. Yet, they have received little attention to understand why writers, filmmakers, singers, painters, sculptors and ceramists bring in their works elements found in nature and environment to achieve perfect imagination and creativity.

Modern literary studies, however, try to approach the use of nature and environment to understand their contribution particularly in relation with the fight against global warming and the protection of nature and environment. Ecocriticism finds meaning within this perspective. In some situations, nature and environment are utilized by writers and artists to represent the

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moral and cultural feelings of an individual or a community. Hence, an ecocritical reading can help a reader understand the world in its cultural, social, spiritual and physical existence and thereby promote humanity within its holistic ensemble.

Putting very simply, Ecocriticism is a critical literary thinking that examines the representation of nature and environment in arts and literature. It analyses the interconnection between life and nature—particularly how nature and environments are treated to represent the human struggle in a world at the mercy of human wickedness. Many writers and artists use nature to show the beauties as well as the vicissitudes of life; the abundant use of flowers like “the roses” in poetry illustrates this case. Hence, flowers of various sorts and plants of all kinds, mountains and valleys, the sun, the stars and the moon, trees, water and rain, rivers, lakes and oceans, birds, sea animals, earth animals, stones, humans, natural seasons, winds, clouds, day, night...are used by poets, novelists, playwrights, filmmakers, musicians, painters and sculptors to represent man’s struggle to promote love, unity, equity, mutual respect and social dignity at the center of human existence. Ecocritical studies, therefore, suggest natural ways, practical solutions and cultural wisdom that man should valorise to preserve life, nature and environment.

This study examined the English curriculum taught in the Secondary schools in Burundi. Upon a meticulous analysis of the contents of the English textbooks, the study explored the importance that education in Burundi reserves on the nature conservation and environment to promote national awareness about the consequences of global warming and the natural disasters that are threatening humanity. It thus examined the importance that the English curriculum of the Secondary school in Burundi attributes to the environmental education to raise collective consciousness about the preservation of nature and environment.

The concepts *ecology*, *nature* and *environment* are three associated terms that entertain close similarities despite some differences. They are central to any ecocritical thinking to understand the world around us. *Nature* is located at the centre of the trio to give meaning to any ecocritical study. It is the comprehensive world of the living and non-living organisms that surround us—man himself included. Nature makes humans, animals and plants’ lives possible. But human action is deceptive. While ecology as a science takes interest in the natural relationships between living organisms such as predation, pollination, mating or desertification and the relations between these organisms and the milieu which is housing them, environment represents the three natural realms where the living and non-living organisms find home. These realms are: the land, the aquatic world of oceans, lakes and rivers and the atmosphere.

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When an element of nature is born, it takes time to grow as time goes on. Any element of nature is born either from real parents or out of the vestiges of dead matter through parthenogenesis. That is why nature is life itself; it conditions life on earth in many ways. Human treatment of nature defines the future of life for both the living and non-living matters. When man's actions grow loose, nature and environment react bitterly. As a consequence, life on land and under water is threatened by terrible destructive natural disasters that emanate from human irrational management of nature and environment.

Education on environment is very important to prepare humanity to reserve an effective control of nature. Knowledge about the conservation of nature and the protection of environment contributes significantly to the advancement of the respect of the values of the promotion of the environment in its diverse forms. Life on land is different from life under water; it is still different from the life in the atmosphere [birds, insects] and the "life" of the ozone layer. The ozone layer deserves greater attention: it is the umbrella that protects humanity against several world catastrophes. Global warming with its destructive threats is a case in point. Burundian learners need be introduced to the primary principles on environment. Early environmental education to young generations is useful to assist them grow nature-sensitive to keep the environment safe and protected.

Research Problem

Nature and environment are source of life. They are interconnected. Environment and ecology cannot have meaning outside nature. The air humans breathe and the life they hold are gifts from the environment and nature; the life of the aquatic, terrestrial and atmospheric biodiversities is also possible thanks to environment and nature. The animate and inanimate—plants and animals, each in its own individuality—owe life to nature and environment. Hence, it is essential to teach learners the meaning and the importance of nature and environment and the related ethics of their preservation since the early years of education for the better future of humanity.

This ecocritical assessment of the English curriculum of the Secondary school in Burundi examined the place reserved to the teaching of nature and environment to raise students' awareness about nature and environment to participate to their effective protection and promotion. This environmental consciousness from the early schooling is very important since it establishes a foundational stone to the environmental education to reach the community's collective cognizance against the rampant destruction of environment that is becoming a national concern in Burundi as time passes.

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Research Objectives

The study achieved the following objectives:

1. The investigation and analysis of the themes and contents of English curriculum taught for sustainable environment at the Secondary school in Burundi
2. The assessment of the contribution of the current English curriculum to environmental education
3. The identification of topical environmental themes useful for environmental education to raise collective awareness about the preservation of nature and environment

Research Questions

To achieve its objectives, the study was guided by the following questions:

1. What proportion of curriculum content addresses environmental sustainability?
2. What environmental themes exist in Burundi's English curriculum?
3. How adequately do these themes support environmental education?

Research Methodology

Population

This research on language and environment education was a qualitative study that interrogated the contribution of the environmental education imparted to learners through the environmental themes integrated in the English curriculum of the secondary school. First, the study analysed the environmental knowledge that learners benefit from the environmental training. Second, it looked at how the teaching of nature and environment feeds language in the process of learning English as a foreign language (EFL).

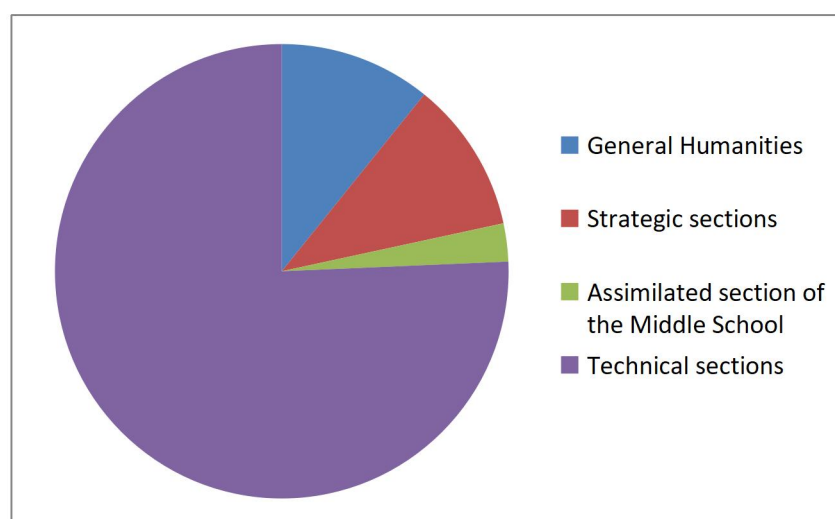
In the educational system of Burundi, the Secondary School is subdivided into two stages: the Basic school (Primary and Middle school combined) that starts from Grade₁ to Grade₉ and the Post-Basic school (Upper Secondary) which spans to four years depending on the nature of the field of learning. The Middle Secondary—technically called Fourth Cycle of the Basic School—comprises three grades: Grade₇, Grade₈ and Grade₉. The Upper Secondary is very large. It comprises a lot of tracks (fields) of learning. Some tracks have a learning cycle of three years while others have four. These tracks are: Sciences Track, Languages Track, Pedagogical Track, Economics Track, Law Track, Math-Statistics Track, Social and Human Sciences Track and a variety of several technical tracks such as: Computer sciences, Business and Administration,

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Paramedical studies, Agriculture, Veterinary sciences, etc. In all, there are 28 technical tracks, 4 tracks of general humanities and 4 strategic tracks (Economics, Judiciary, Pedagogy, Math-Statistics). Hence, the total population of the study covered 36 tracks of the Upper Secondary School and 1 assimilated track constituted by the 3 grades of the Middle School (Primary).

Table₁: Categories of tracks existing in the Upper Secondary school in Burundi with the Middle School

Sections	Number	Percentage [%]
General Humanities	4	10.8
Strategic tracks	4	10.8
Assimilated track made of the Fourth Cycle i.e. Middle School (Grade ₇ , Grade ₈ and Grade ₉)	1	2.7
Technical track	28	75.7
Total	37	100%



Graph₁: Representation of the sections reflected in the table above

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Table2: Learners' enrollment per field of knowledge: 2024-2025

Track	Number of schools in which the track is present	Boys	Girls	Total	Percentage
Languages	146	35018	38900	73918	42.6
Sciences	128	36800	35289	72089	41.5
Pedagogy	56	3787	4647	8434	4.86
Human and Social Sciences	37	3124	2118	5242	3.02
Economics	26	313	492	805	0.46
Law	30	520	580	1100	0.63
Paramedical Science	12	397	512	909	0.52
Agriculture	10	589	276	865	0.49
Veterinary Sciences	3	251	128	379	0.21
Math-Statistics	25	1450	1160	2610	1.50
Mechanics	8	556	299	855	0.49
Electricity	6	200	149	349	0.20
Electronics	11	525	245	770	0.44
Plumbing	4	265	93	358	0.20
Masonry	5	220	86	306	0.17
Woodworking/ Carpentry	4	256	43	299	0.17
Computer Sciences	31	736	985	1721	0.99
Management and Administration	21	510	380	890	0.51
Commerce and Administration Techniques	8	142	466	608	0.35
Others	6	510	300	810	0.46
TOTAL	286	86169	87128	173297	100%

Source: <https://datatopics.worldbank.org/education/burundi>

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The Languages Track and Sciences Track are the largest tracks that have a lot of pupils in the Upper Secondary School. The Languages Track takes the lead: it houses 73918 learners while the Sciences Track counts 72089 pupils. This represents respectively 42.6% for Languages Track and 41.5% for Sciences Track. Alone, the two tracks have 146007 pupils over a total population of 173297 learners. This represents 84.1% of all the students attending the Upper Secondary. The Pedagogical Track is the third track in pupils and in schools where it is present. It lodges 8434 pupils, that is, 4.86%.

Sampling

Out of the 36 tracks found in the Upper Secondary School in Burundi, only 3 tracks were selected. These are: Sciences Track with two sub-tracks (Math-Physics Track; Biology/Chemistry-Earth Sciences); Languages Track and Pedagogical Track. The study also added the ending three grades of the Basic school (Grade₇, Grade₈ and Grade₉) to constitute a representative sample of 4 "tracks" that reflect the important features and qualities of the population under study.

There are many factors that motivated the choice of this sample. First, the three grades of the Middle School constitute the foundational base by which every learner across the world must pass before they are admitted to the Upper Secondary. Even learners who fail to continue education to the Upper Secondary need preliminary education on environment. That is why the Fourth Cycle of the Basic School, which is the Middle Secondary School, was selected.

Besides, the 2 tracks of General Humanities of the Upper Secondary School i.e. Sciences Track and Languages Track were selected because they house the highest population of students attending the Upper Secondary school in Burundi. The Pedagogical Section was added to the sampled tracks because it is a track established in many schools nationwide after Languages and Sciences tracks. In fact, the 3 tracks were selected to constitute the sample of the study because they represent a vast learning population of around 85% of the pupils attending the High secondary school nationwide. In short, a representative sample of the 4 "tracks" was constituted out of a population of 37 tracks to guide the study.

Data collection and analysis

Basing on the English textbooks used in the sampled tracks, the collection of relevant data for the study targeted the themes and the related texts that discuss environmental issues.

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In the course of analysis, the study examined the types of nature and 'environments' developed in the textbooks. The selected themes in relation with nature conservation and environment protection were analyzed to check if they respond effectively to the basic needs of the young learners of the secondary school. In addition, the analysis examined the vocabulary used in the texts under study to explore the contribution of environmental education to language learning.

Related Literature Review

Environmental education is an important factor to the socioeconomic development of a society. To achieve the objectives of the two first Sustainable Development Goals of the United Nations (UNDP, 2015) whose action centers on the eradication of poverty and hunger, environmental education plays a crucial role. This education imparts scientific as well as societal knowledge to communities to know how to positively interact with the environment and nature. With progressive education on environment, community members acquire basic knowledge regarding the conservation, the protection and the inclusive strengthening of nature and environment to fight against global warming and other anthropogenic disasters such as desertification and water pollution.

In its report on environment and climate change, the organization MDG Achievement Fund (2013) holds that "the notion of the environment...has gone from strictly natural resource preservation efforts to more contemporary notions that sustainable development should be people-centered yet at the same time it should be in harmony with the environment..." The report highlights that "...sustainable development incorporates economic, social, and environmental variables in an integrated manner." (p.6)

People cannot speak of development in whatever form it may be without taking into account the environment around. Nature is unpredictable. It becomes what we make of it. It is the source of social and economic stability to achieve transformative ways to advance humanity. Hence, basic knowledge in sustainable development for every nation must include duties that address the valorization of nature and environment.

The lack of observation of environmental obligations results in climate change that births terrible natural disasters which later cause human devastations. Examining the effects of human action on earth, Singh (2022) cautions people against the dangers of climate change which originate from a deliberate lack of respect of environmental laws. He explains:

Climate change refers to the observable consequences of the ongoing warming trend. [It] is often measured...in temperature, rainfall, snowfall, and wind patterns. Climate change is

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caused by humans burning vast amounts of fossil fuels (coal, oil, and natural gas), as well as deforestation. (p.8)

High temperatures caused by climate change cause oceans to melt. The deep melting of the ice causes appalling rise in sea level. This situation generally results in devastating floods that leave humans and their surroundings homeless. When these temperatures become heatwaves in some countries especially during summer, they cause dangerous diseases that wipe out human and animal lives. This is the case of Western Europe. Uncontrolled rainfalls that cause massive landslides threaten human life in areas where land is not strongly stable. These rainfalls are generally accompanied by violent winds in form of tornadoes and hurricanes that destroy everything they meet. Human deforestation and massive consumption of fossil energies result principally in the massive emissions of dangerous greenhouse gases like CO₂, N₂O and CH₄. These gases are responsible for the destruction of ozone layer and the neighboring zones including land. All these challenges can be avoided thanks to a steady education on the values of nature and environment.

The United Nations Inter-Agency Secretariat for the Strategy for Disaster Reduction (UN/ISDR) and the United Nations Environment Program (UNEP) (2004) reveal that "environmental protection and planning reduce our vulnerability to disaster, and it increases our capacity to recover from a disaster after it has occurred. If the appropriate measures are implemented timeously they can reduce or even eliminate the risk of a disaster occurring in the first place" (p.8). The environmental education reduces cases of risk of disasters. For instance, the threat of climate challenges and vulnerability generated by desertification or water and air pollution can be avoided thanks to good education to environment and effective planning strategies of human actions. This environment "made up of the earth, water, atmosphere and biosphere" must be handled carefully to transform it into a home (p.8). The UN/ISDR and UNEP report maintains that "environmental protection requires the adaptation of indigenous skills and the learning of new ways to avoid increasing dependence on outside support. It illustrates the paradox that learning new methods and adapting old ways can be a key to securing the future of indigenous cultures." (p.8)

Education is key to development. Basic sensitization starts from home. Local education about the importance of planting trees particularly in the prairies, steppes and mountains, the elimination of plastic bottles and polythene bags, digging canals on high lands and agricultural soils, educating people about the dangers of deforestation, forest fires particularly in dry season, fighting against poaching...are some of the basic knowledge that can be easily given and received to indigenous communities without sweat to advance the nature

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conservation and the protection of environment. The implementation of these tasks requires simple procedures that demand limited financial costs and simple technical intellect.

For instance, it is important to teach learners that "Climate change is a driver of displacement forcing people to leave their homes. At the same time, climate change can impede or prevent human mobility, sustainable development, and access to rights and thereby have an impact on displacement dynamics" (Danish Refugee Council, 2021, p.5). Focusing on recent climate disaster in the northern part of Burundi (Kirundo), where repetitive droughts brought many families to flee to Tanzania in 2016 and the following years, learners and even uneducated communities can easily understand the severe consequences of deforestation. Famine that brought unprecedented poverty until people migrated to neighboring countries—Rwanda and Tanzania—originated from the lack of precipitations.

In any case, people should know that "when the environment becomes degraded, all forms of life are threatened" (UN/ISDR and UNEP, June 2004, p.13). We cannot not eradicate poverty and reach "Zero hunger" if we do not valorize the protection of environment in all its forms. The biosphere in which man is at the center needs particular human effort to preserve its survival. For every event that calls for human action, "we need to ensure that our activities do not damage the diversity and integrity of nature, and that resources are used in a sustainable manner" (Ibid. p.13). The education given to pupils in the early years of schooling and to local communities shall prepare them to know that "effective management of the environment is essential if we are to reduce the impacts of natural disasters and the risks associated with environmental degradation in Africa" (Ibid. p.13). This is an important dynamic for humanity which aspires to promote ethical managements of nature, ecology and environment for an effective future of mankind.

Antoine (2020) examines the role of law in the valorization of environment. Considering the acute threats that the biosphere and its diverse ecosystems are experiencing mostly because of human ignorance, he advises that

...no one is entitled to destroy life slowly by contaminating the sources and basic necessities of life — water, air, space, fauna and flora — or to tamper with any of the elements that contribute to our present and, a fortiori, our future wellbeing and happiness. [...] the environment...conditions everything, and the definition and proclamation of...humanity's rights and duties in relation to the environment can no longer be postponed. (p.520)

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Knowledge of the law that protects environment in its multiple forms is very important. Local laws as well as international ones must be taught to community members and learners to know the principles they should observe to preserve environment. This knowledge about the environmental law would reduce some risks that actually occur unwillingly.

For instance, a lot of people from local communities in many African countries do not know the dire consequences of deforestation. The idea that trees (vegetation) contribute significantly to the mechanism of precipitations, that planting trees can bring solution to desertification, is a fact is totally unknown to many uneducated local populations. Knowledge about the environment shall contribute to the reduction of desertification and the related consequences.

Besides, while pupils are learning the laws, the rules and the principles on how the world should be protected and promoted at ecological level, they also acquire a new vocabulary that expands the learners' communicative competences in English.

In all, knowledge about nature conservation since the early years is important to protect and make our environment grow. Learners obtain a significant impetus that shall solidify collective awareness about man's obligations vis-à-vis the conservation of nature. The acquired knowledge will help avoid or at least reduce the causes of biodiversity loss under threat of human ignorance and irresponsibility that generate irrational destructive actions that result into the destruction of humanity (Wulf & Schuster, 2024, p.5).

Analysis, Results and Discussion

The representation of *nature* and *environment* in English textbooks of the Middle Secondary School

Presentation of the pupils' textbooks

In accordance with the new reform in the educational system of Burundi since 2014, the Middle secondary school corresponds to the Fourth Cycle which starts from Grade₇ to Grade₉. In this cycle of learning, locally referred to as *Fourth Cycle of the Basic School*, the English subject has four hours per week. In Burundi, English is taught along with French, Kirundi and Kiswahili in those classes. For every term, the content materials to teach for these four languages are compiled in one textbook. Therefore, there are three textbooks for the three terms that compose a school year: Tome₁ for the first term, Tome₂ for the second term and Tome₃ for the third term.

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Structure of the contents in the pupils' manuals

In the Fourth Cycle of the Basic school (Middle Secondary school) respectively in Grade 7, 8 and 9, only 3 themes on environment have been suggested. Their title is "Environment." The themes have been developed into 6 texts:

- Let's start on Saturday
- The international Day of trees
- Smoke is harmful!
- A visit to Kigwena nature reserve
- Water pollution
- I'm afraid of the lion

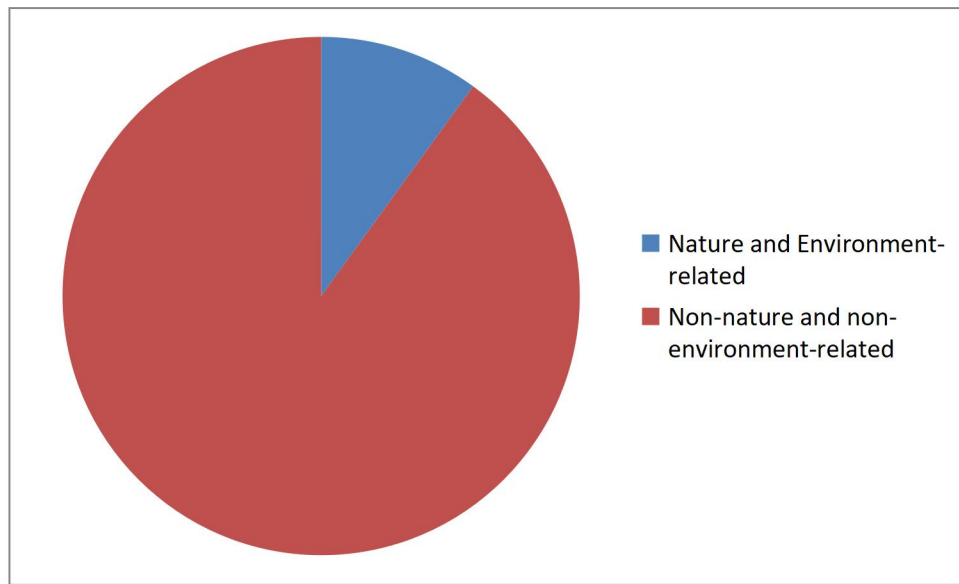
In this Fourth Cycle of the Basic school, 30 themes developed in 56 texts have been designed to constitute the major articulations of the English textbooks. However, out of the 30 themes that constitute the English curriculum, only 3 themes in relation with nature and environment have been provided. These themes are developed into 6 texts that discuss superficially issues in connection with nature and environment. This represents 10% of the curriculum learnt over a learning cycle of three years. The typically environmental themes represented in the suggested texts for study are:

- Nature conservation
- Water pollution
- Air pollution

Table3: Contents distribution of the English curriculum in the Middle School with regard to nature conservation and environment protection

Themes	Number	Percentage [%]
Nature and Environment-related	3	10
Non-nature and non-environment-related	27	90
Total	30	100

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Graph₂: Representation of nature and environment as reflected in the table above

Examining the contents that constitute the curriculum of the Basic school, the study noted that there is an acute imbalance in the contents design. Lessons in relation with nature and environment have been profoundly neglected while designing the curricula. A situation of 3 themes (10%) that introduce nature and environment out of a volume of 30 themes reveals that environment has not been reserved a significant space in the course design. This has a negative impact on the future of the learners and mankind. They will grow almost ignorant with regard to the values of the protection and promotion of environment.

As consequence, the contemporary challenges of global warming like: desertification, glacier melting which is responsible for oceanic devastating floods, violent and destructive hurricanes, air pollution that causes the destruction of ozone layer and a lot of diseases...will increase and cause more atrocious disasters never seen before.

After Primary education, Middle school is a foundational learning stage that every learner worldwide must go through before joining the Upper Secondary School. This implies that Middle school education is the base of learning. At this period, it is important to teach the young learners the different principles and ethics about environmental education since the early years of schooling. This will help learners grow culturally and scientifically nature-conscious and environment-caring for the future of humanity. Informative contents that treat nature conservation and environment protection are very important for learners of the Middle school to get scientifically prepared to the defense and promotion of environment.

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The representation of *nature* and *environment* in English textbooks of the Upper Secondary School

Languages Track

Presentation of the English textbooks used in the track

The Languages Track is one of the several tracks that compose the Upper secondary school in Burundi. The main objective of the Track is the promotion of the teaching of languages that are basically used in Burundi. These languages are: French, English, Kirundi and Kiswahili. The Languages Track comprises a learning cycle of three years: First Year Languages, Second Year Languages and Third Year Languages. Regarding the teaching of the English subject in this Track, there is a pupil's manual that runs across the school year for every Grade. Each pupil's manual has a corresponding elaborate Teacher's Guide that helps the teacher prepare lessons efficiently. In all, there are three pupil's manuals with three Teacher's Guides that constitute the English textbooks for the whole track.

Structure of the contents in the teacher's guides

For the whole cycle of learning in the Languages Track which spans over three years, 29 themes developed in 156 texts have been designed to constitute the major articulations of the contents of the English textbooks. However, out of the 29 themes that constitute the English curriculum, only 1 theme in relation with nature and environment has been designed. This theme is developed into 4 texts that discuss superficially issues in connection with nature and environment. The theme title is "Environment pollution" with only four texts suggested for study for the whole cycle:

- Water pollution
- Land pollution
- Air pollution
- Chemical pollution

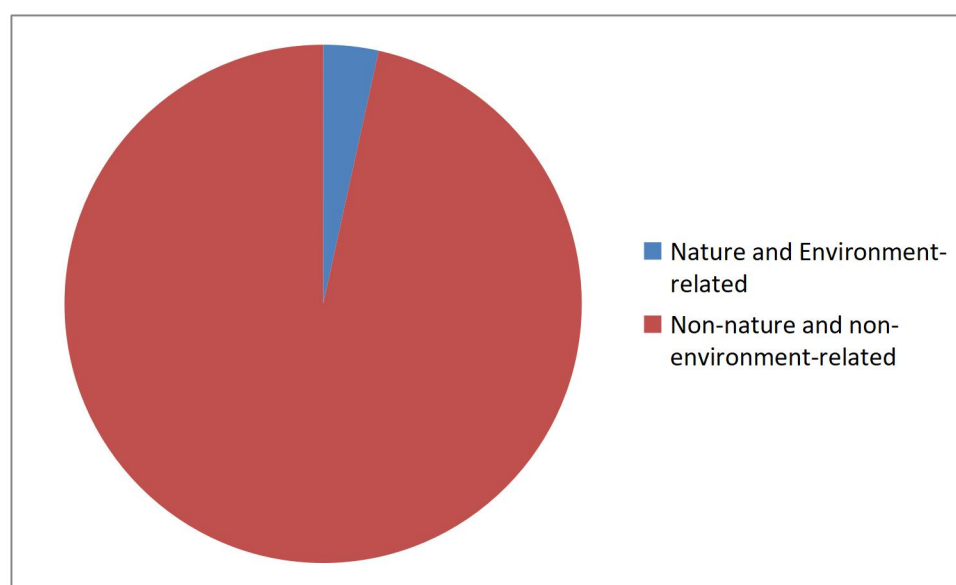
This represents 3.4% of the curriculum designed for a learning cycle of three years. A deep analysis of the English textbooks designed for the Languages Track revealed that lessons in connection with environment, nature and climate change have been given little consideration. Even the four texts suggested for study are generally taught in a literary way rather than in a technical manner that would impart important environmental knowledge about the conservation and protection of nature and environment. Like the English textbooks conceived

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for the Middle secondary school, the study observed that there is an open inequity in the contents design of Languages Track. Lessons that discuss environmental issues are few in number and are less impactful with regard to the superficial contents they treat.

Table4: Contents distribution of the English curriculum in the Languages Track vis-à-vis nature conservation and environment protection

Themes	Number	Percentage [%]
Nature and Environment- related	1	3.4
Non-nature and non-environment-related	28	96.6
Total	29	100



Graph₃: Representation of nature and environment as reflected in the table above

Having only 1 theme on environment, i.e. 3.4% out of 29 themes in a period of three years of training, this situation shows that issues related to nature and environment were undervalued in a section that houses almost half of learners of Upper secondary school in Burundi. 3.4% is almost insignificant to prepare the younger generations to the climatic and environmental challenges that the world is facing. This lack of stress on environment may cause serious consequences in the future. It has been indicated that nature conservation and environment

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protection curriculum is lamentably lacunar, almost inexistent. Nothing is almost taught to Languages students about environment. As a consequence, they complete the Secondary school almost ignorant about the basic values for nature protection, climate change and environment promotion. Even the little of the contents that has been suggested is not actually taught within the aims to seriously impart consistent environmental knowledge to learners. The pedagogical preparations found in the teacher's guides focus deeply on textual literary aspects. This curriculum needs to be adapted to meet the current national and world needs.

The Languages Track is the field that accommodates the largest number of learners in the Upper Secondary School in Burundi. Nearly half population of learners nationwide attends this track. This situation implies that once a consistent curriculum on the defense of environment is designed and taught in this section, nearly half of the secondary school graduates shall complete secondary education with required knowledge and competences to disseminate environmental education and ethics in the societies where they were born to raise societal consciousness about environment.

Sciences Track

Presentation of the English textbooks used in the Track

Sciences Track is a field of learning that puts forward the promotion of sciences. It comprises two sub-tracks:

- Math-Physics
- Biology-Chemistry and Earth Sciences

The length of studies covers a period of three years. Concerning the teaching of English, there are three Teacher's guides with three Pupil's manuals respectively that correspond to the three years of learning—each Year of study having its own textbook. Every textbook is subdivided into three "Stages"—a *Stage* being a period of learning that corresponds pedagogically to a term in the field of education. Contents are established into selected themes with texts that reflect the topical issues of human existence in the contemporary age.

Structure of the contents in the teacher's guides

In this Section, 12 themes developed in 43 texts have been designed to constitute the English curriculum for the Track over a cycle of learning of three years. Out of the 12 themes that constitute the curriculum, 5 themes discuss issues related to nature, environment and global warming. These themes are:

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- Environment
- Invention
- Solar energy
- Science and technology
- Global warming

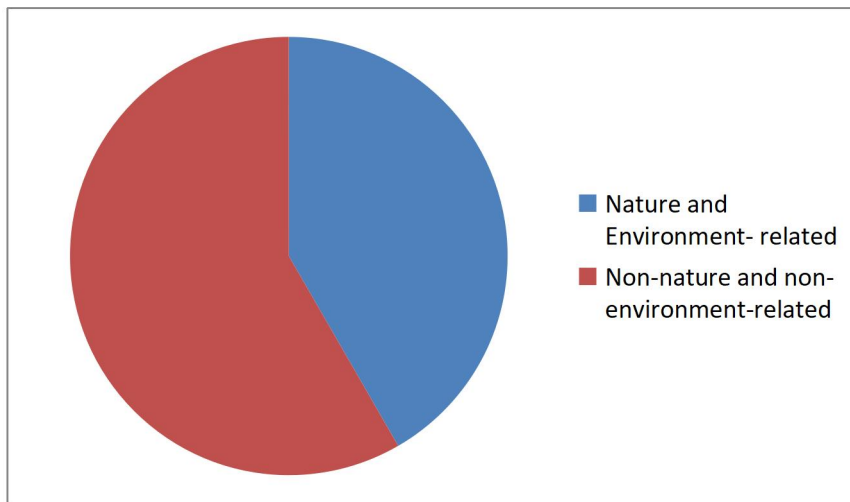
The 5 themes are developed into 15 texts that expose various challenges against environment. These texts are:

- Uses of Oxygen
- Pushing back the desert
- Over 20 years ago the Lake Nyos tragedy
- Radiation
- Weather around the world
- Glazing materials
- Disadvantages of solar energy
- Wind energy
- Tracking climate change
- Drinkable ocean water
- Ocean resources: Fisheries and minerals
- Keeping track of biodiversity
- Climate change
- A Democrat's mission: Save the world
- Climate change: Is Global warming to blame?

Table 5: Contents distribution of the English curriculum in the Sciences Section vis-à-vis nature conservation and environment protection

Themes	Number	Percentage [%]
Nature and Environment- related	5	41.5
Non-nature and non-environment-related	7	58.5
Total	12	100

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Graph4: Representation of nature and environment as reflected in the table above

The 5 themes out 12 represent 41.5%. This distribution is relatively sufficient. There has been balance in contents design. Subjects related to the field of nature and environment have been selected in relation with the contents volume. Learners are exposed to sufficient lessons of English with regard to the protection of environment. But themes that have been suggested in the textbooks are not scientifically developed to satisfy the needs of students. The Sciences Track aims to promote natural sciences. The pedagogical methods provided in the teacher's guides to prepare lessons in relation with the texts that have been suggested do not favor a deep scientific exploration that shall impart considerable knowledge to learners. Issues in connection with greenhouse gases, the CO₂, dangers of fossil energies should also be introduced to open the learners' minds about the dangers that are threatening the world. Since they are science students with physics and chemistry knowledge, they can easily understand such technical lessons.

It is important to mention that the Sciences Track comes second after the Languages Track in terms of the number of students it houses in the Upper Secondary school in Burundi. This is because the two tracks are found in several schools across the country with around 85% of students at national scale. Other sections, particularly technical sections, are found in few schools with relatively limited number of students. The demographic pressure of students found in the two tracks is very indicative. This implies that if the rules, values and ethics about nature conservation and environment protection are efficiently taught in these two sections, a large number of educated Burundians can complete education with significant knowledge about nature and environment. They can later serve to educate the other "environmentally

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uneducated” Burundians about the demands of nature, environment and global warming across the nation because graduates in these tracks are found nationwide.

Pedagogical Track

Presentation of the English textbooks used in the track

The Pedagogical Track is a field of learning that aims at training future teachers of the beginning Basic School (Primary school). While the Languages Track and Sciences Track have each three years of learning, the Pedagogical Track spans on a cycle of learning of four years. Many of the courses taught in this track are related to the art of teaching though some science and language courses are included in the curriculum to reinforce learners’ scientific and linguistic competences. Regarding the teaching of English language, there are four Teacher’s guides with four Pupil’s manuals respectively that correspond to the four years of learning. Like other sections, every textbook is subdivided into three “Stages.” Contents are structured into selected themes with texts that reflect the topical issues of today’s life challenges.

Structure of the contents in the teacher’s guides

The English course taught in this section comprises 22 themes that cover the four years of learning. Out of the 22 themes, only 2 themes discuss issues related to nature and environment: these themes are elaborated in 5 texts only.

A deep analysis of the contents reveals that there is a deep gap in the distribution of the contents between subjects related to environment and subjects that treat other issues of life. This imbalance should be revised because it reduces learners’ knowledge on environmental education. The 2 themes on environment are developed into the following texts:

- Fighting pollution
- Why do we need to save the environment?
- The destruction of the rainforest
- Amazing wildlife facts
- Gentle giants in trouble

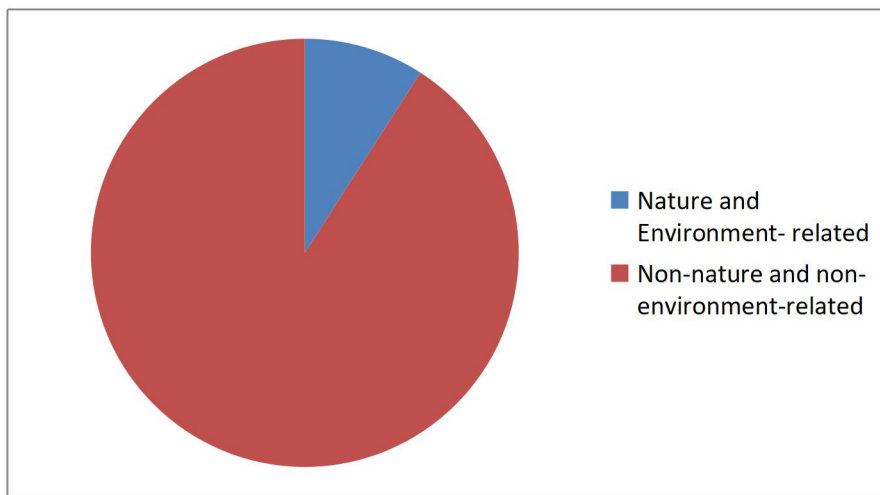
Briefly, the texts reflect four environmental fields:

- Nature conservation and biodiversity
- Preservation of environment
- Pollution
- Deforestation

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Table₆: Contents distribution of the English curriculum in the Pedagogical Track vis-à-vis nature conservation and environment protection

Themes	Number	Percentage [%]
Nature and Environment- related	2	10
Non-nature and non-environment-related	20	90
Total	22	100



Graph₅: Representation of nature and environment as reflected in the table above

Analytically, the 2 themes on environment represent 10% of the total curriculum taught over a learning cycle of 4 years. This is very short and pedagogically incomplete to significantly train learners on environmental issues. But the contents elaborated on these themes are consistent and expose learners efficiently to the environmental matters discussed in a detailed manner. Although they are few in number, these topics are very informative for students. They point directly to the very useful basic notions on environment that should be known to every teacher to later teach them to one's students. But, as it has been observed as a greater challenge in the other textbooks of the other tracks, the way the texts are prepared to be taught in the teacher's guides gives less input to the defense and advancement of environment.

Considering the structure of lesson preparations provided in the teacher's guides, the study discovered that lessons are prepared to satisfy textual literary analysis. The suggested methods to apply while teaching and the architecture provided to prepare lessons do not focus much on

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the scientific stand point. The teaching protocol that has been suggested to teach English not only in the Pedagogical Track but also in the other sections has minimized the scientific side. This dimension is however important because it helps understand the importance of the protection of environment and the obligations that humans must fulfil. Textual teaching is less impactful for learners. For this reason, technical implementation of the information provided in the texts should be valorized to give learners information that is realistic towards the environmental threats and the related positive response that people have to engage. The knowledge received shall galvanize learners—the future teachers—to teach efficiently the challenges against environment once in service and in the community where they live.

Vocabulary Input from Nature and Environment-Related Themes

The teaching of nature conservation and environment protection is not useful for the defense of environment and climate change only; but it also contributes to learners' growth in communicative competences in English thanks to an acquisition of a new vocabulary from the texts and situations designed for the study. New words are generated by the proposed texts. This vocabulary reinforces learners' capacity to communicate. The development of students' learning would improve significantly if the themes related to nature and environment were relatively balanced with sufficiently topical themes. The new vocabulary is mostly constituted by technical nouns and expressions. The following words and expressions are example of the new vocabulary found across the texts on environment:

Single nouns	Noun phrases	Verbs	Adjectives
calao, poacher, baboon, monkey, springbok, pollutant, asthma, heating, gazelle, jackal, niche, ecology, biodiversity, biosphere, pesticides, solvents, wildlife, habitat, chlorofluorocarbon, polythene,	air pollution, indoor air pollution, outdoor air pollution, solid fuels, traditional stove, forest fires, water pollution, brook, domestic water, industrial waste, polluted water, typhoid fever, ozone layer, infantile mortality, petrochemical products, chemical fertilizers, cancer of bowels, human fertility, congenital malformation, harmful pollutants, living organism, global warming, Mother Nature, flora and fauna, climate change, carbon dioxide, sea	to become extinct ...	Paramagnetic ...

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rainforests, desertification, liquefaction, timber, oxides, hydroxides, landslides...	rise, sea levels, greenhouse gases, gaseous chemical elements, stellar carbon cycle, fractional distillation, water electrolysis, diatomic gas, green belt, volcanic eruption...		
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These concepts help develop the existing learner's communicative competences in English both in writing and speaking. Much of the new vocabulary is made of nouns.

Research findings

In all, it was noted that nature and environment themes have been given little attention while designing the different programs of the English curriculum of the Secondary School. Much of the contents in the tracks discusses language issues such as grammar, vocabulary and various aspects of writing even in the advanced years of the Upper secondary school. Themes on environmental education integrated in the textbooks contents are not pedagogically elaborated. They do not focus in depth on what should really be done to keep nature and environment safe from the current challenges. Some themes present less impactful scientific consistency to empower learners with significant knowledge about the defense of environment and the preservation of nature. However, on language ground, the study remarked that the suggested themes on environment and ecology generate a rich technical vocabulary that is quite unfamiliar with learners. Pupils benefit a vast vocabulary made of new words and expressions that reinforce linguistic communicative competences.

Important Environment-Related Subjects for Curriculum Improvement

The defense of nature and environment is imperative to save the world in danger. Although there are many uncontrolled factors responsible for natural disasters which do not emanate from human action such as: earthquakes, volcanic eruptions, hurricanes and tornados, a lot of natural and environmental threats stem from human wickedness and ignorance. To advance environmental education that shall contribute to protect nature, environment and fight against climate change, the following principles should be observed:

-Curricula need to integrate environment contents that treat topical issues the world in general and Burundi in particular are facing.

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-Those curricula should contain contents that impart learners basic useful knowledge on the current issues:

- Reforestation to fight against desertification
- To forbid people cutting trees abusively since they contribute to rainfall
- Digging drains to fight against erosion
- Sensitize local communities on the dangers of non-biodegradable objects like plastic bottles and polythene bags against human health and natural hygiene, the land and aquatic biodiversity, and arable soils
- dangers of pesticides and chemicals in agriculture
- The dangers of forest fires on the biodiversity and agriculture
- The consequences of overfishing and poaching
- The dangers of anarchical extraction of materials for construction from rivers
- Land pollution
- Air pollution
- Indoor air pollution
- Water pollution and the survival of the biodiversity
- Dangers of fossil energies on ozone layer
- The importance of Recycling
- The importance of renewable energies to protect the environment: Solar energy, wind energy
- The greenhouse gases and their consequences on ozone layer, land and human health
- The effects of war on the protection of environment
- National and international laws on environment
- Techniques of the conservation of soil fertility
- The international days for nature conservation and environment preservation

Curriculum designers should have these points in mind while designing a course contents.

Conclusion

Human action has gone loose against nature and environment for ages. Most of natural disasters that are threatening humanity emanate from human recklessness to minimize the risks of self-destruction. Besides, the growing ignorance on environmental education in many local communities weakens the efforts to promote nature and environment. An overall observation of the English curriculum of the Secondary school in Burundi has indicated that themes and lessons related to the defense of nature and environment have been minimized. Few lessons were designed in favor of nature, environment and climate change. Only 16.02% of

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the curriculum of the Secondary school discusses matters related to nature and environment. This rate is very low to impart learners considerable knowledge about the preservation of environment. The imbalance in contents design affects the learning competences in the long run. Students complete the Secondary school without significant knowledge for the defense of environment. Teaching the values of nature, environment and climate change from the early years of education is very important to learners. Progressively, they should grow scientifically conscious and naturally caring about the values and ethics of environment to contribute to the protection and development of the world.

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