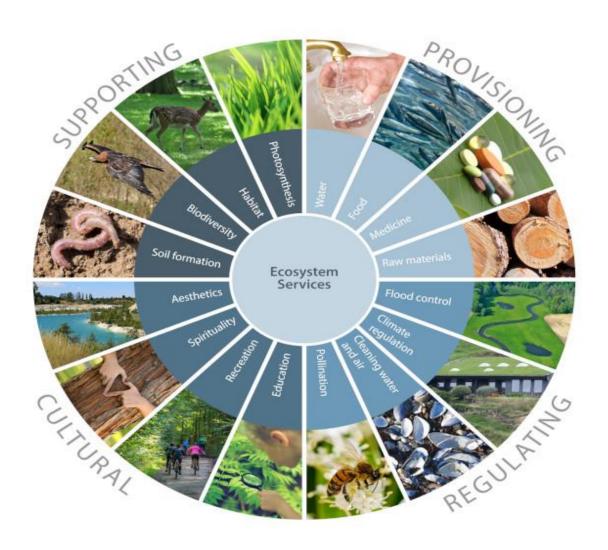








ENVIRONMENTAL AWARENESS CURRICULUM MODULES FOR SECONDARY SCHOOLS IN LIBERIA



November 1, 2020

 $Cross-Cutting\ Capacity\ Development\ Project/Environmental\ Protection\ Agency/\ (EPA)$

Republic of Liberia









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FOREWORD

In 2020, the EPA in consultation with the Ministry of Education (MOE) developed an "Environmental Awareness Curriculum/Modules for Secondary Schools in Liberia". The decision for such an intervention was based on a realization that the pace of environmental education and awareness required additional catalyst the logic was, if the EPA succeeded in making environmental protection, education and awareness an issue, and a subject matter for schools, teachers, students and school administrators, they would become members of the global community advocacy teams. The first step was therefore to develop a user friendly curriculum that secondary school teachers would utilize for pedagogy to grades 10th through 12th.

According to Articles 7 of Chapter 11 of the constitution of Liberia, which came into force and effect on January 6, 1986, may be interpreted to provide for full public participation of all citizens in the protection and management of the environment and natural resources of Liberia. The Bill of Rights and the constitution of Liberia guarantee every person in Liberia the right to life, and by extension, the right to clean and healthy environment that support life in pursuance of social and economic development, but without undermining the eco-system' renewal and resupply processes which is the underpinning of sustainable development.

In today's global village, the core contents of our environmental curricular modules is sustainable land development, biodiversity and climate change which have taken center stage as the major global environmental protection issues and these are the issues for which the EPA was established. It is this realization that spurred the development of the 17 sustainable development goals (SDGs) which contains a significant number of goals (Goals 6, 7 & 11-17) on environment. In Liberia, new challenges emerged over the last three decades (1990 -2020) that demand collective action of the total population.

While it is true that the devastation of the "civil war years" which took a significant toll on the environment and socioeconomic fabrics is history, the need for proactive action: mitigation and adaptation remain dire and immediate. Overtime, the EPA has approached the challenges in several diverse ways. Since its inception the EPA has been in the trenches in compliance with national and global calls to protect the environment. Consequently, it has implemented myriad









of activities aimed at protecting the ecological niches and national biodiversity via workshops, capacity development seminars and advocacy.

At the recent National Adaptation Plan (NAP) project on January 13, 2021, it was urgently stressed the need to align development plan with the sustainable management of the environment, since everything is impacted by climate change. We also noted the need for a more realistic inclusion of environment and climate change into the country's development plan because "climate change has massive and compelling effect on everything we do."

The development of a pedagogical instrument, and training of teachers to deliver its content is a milestone not only for the EPA but for the Ministry of Education and all communities over the length and breadth of Liberia. We strongly believe as we have always, that there is a gap of knowledge among the population and within various communities, regarding how the environment, utilized and protected. We are therefore hopeful the Environmental Awareness Curriculum Modules document will make the anticipated difference.

Professor Wilson K. Tarpeh Executive Director/CEO Environmental Protection Agency









1.0 INTRODUCTION

On August 6, 2020 the Diversified Educators Empowerment Project (DEEP) entered a contract agreement with the Environmental Protection Agency (EPA) of Liberia to design curriculum modules for environmental awareness education for secondary schools in Liberia. The key reason for the process is to create awareness over the use and protection of the environments as laid out by The Three Rio Conventions¹.

Led by CEO and Lead Consultant Moses Blonkanjay Jackson, DEEP is a non-governmental agency specialized in general developmental initiatives implementation including general education management. DEEP is presently involved with curriculum development, teacher training, project evaluation and community mobilization.

1.1 Divisions of the Curriculum

The curriculum is divided into two components, (1) The Curriculum Framework, and (2) The Pedagogic Details or the Teaching and learning pathways. The framework is a profile of the pedagogic details, and serves as the snapshot of the content and process or the road map.

The four modules also serve as guide to the pedagogy as each is focused on a specific environmental awareness topic or construct. While the modules may have different numbers and nomenclatures, the contents are interrelated and serve as basis for each other.

1.2 Features of the Curriculum

The curriculum is not scripted whereby teachers would be regimented to step-by-step procedure in delivery and assessment which usually yields ingurgitation (memorization) and regurgitation (vomiting). Alternatively, the curriculum offers opportunities for teachers and students to be

¹ The Three Rio Conventions derive directly from the 1992 Earth Summit. Each instrument represents a way of contributing to the sustainable development goals of <u>Agenda 21</u>. The three conventions are <u>intrinsically linked</u>, operating in the same ecosystems and addressing interdependent issues.









innovative in ensuring conceptual and deep learning occurs as prescribed by the universal design for learning (UDL).²

As a first step, a document review was conducted. The information gleaned from the review was used to inform the scope and sequence of the curricular modules. The scope in this case is the set of courses or topics that contains the curriculum; the sequence directs the pedagogy, taking into consideration the positioning of the delivery of prerequisites and advanced contents. Following the document review, a framework was developed that served as the platform for teachers and students. The framework is a concise picture or snapshot of the whole curriculum. It therefore explicated the essence and arrangements of the scope and sequence.

The process then culminated by the full curricular details. Contained in the details are the topics to be learnt under each module, the instructional materials, and resources to be referenced. Handouts and activities for students and learners with the assessment methods form part of the details of the curriculum.

As best practice, the curriculum has an "Author's Perspectives" and a foreword from the sponsors of the project which, though placed at the beginning of the document, was constructed last.

2.0 PROFESSIONAL CONSIDERATIONS

The curriculum developers adopted four considerations in the design to be in sync with best practice. By considerations, the document is infused with professional standards which guide the development of regular curricula. The considerations are Horizontal, Vertical, Continuity, Integration, and Articulation, Balance.

² Universal Design for Learning (UDL) is an approach to teaching aimed at meeting the needs of every student in a classroom. It can be helpful for learners, including those with learning and attention issues.









2.1 Horizontal Consideration -Breadth and depth of the content

The first consideration of the curriculum developers was the extent to which the document should be detailed, or the extent of the breadth and depth of the curricular contents. The developers therefore organized all contents, topics, learning experiences comprising the educational plan. This aspect basically responds to the horizontal organization of the substance of the curriculum

2.2 Vertical Consideration - cumulative and continuous learning

The second consideration is the to deal effectively with the curricular elements so that the curriculum fosters cumulative and continuous learning. The developers hence had to decide how content and experience will occur and reoccur so that students have opportunities to connect and enrich their understanding of the curriculum presented or experienced.

This vertical relationship among curricular areas therefore draws on two of several learning principles:

- a. Simple to complex learning-indicates that content is optimally organized in a sequence going from simple subordinate components to or elements to complex components depicting interrelationships among components (easy to hard).
- b. Prerequisite learning-similar to part to whole learning. Works on assumption that bits of information or learning must be grasped before other bits of learning can be comprehended.

2.3 Continuity -Vertical manipulation or repetition of curriculum components.

Reappearance in the curriculum of certain major ideas or skills about which educators feel students should have increased depth and breadth of knowledge over the length of the curriculum; give students opportunities to revisit concepts and skills.









2.4 Integration -Linking of knowledge and experience

This is essentially a design feature to bring into close relationship all the hits and pieces of the curriculum in ways that enable the individual to comprehend knowledge as unified, rather than as atomized. Integration allows learners to acquire unified view and in-depth understanding of the subject matter.

2.5 Articulation -Interrelatedness of various aspects of the curriculum

Vertical articulation depicts the relationship of certain aspects of the curriculum sequence to lessons, topics or course appearing later in the program's sequence. I.e. Design introductory ninth-grade algebra so that concept in algebra class are related to key concepts in a geometry course. Horizontal articulation is the association between or among elements occurring simultaneously. Interrelationship between eight-grade English Social studies and eight grade English. Correlation

2.6 Curricular Balance

Balance means giving appropriate attention to each aspect of the design so that distortions do not occur. In this balanced curriculum, students have opportunities to master knowledge and to internalize and utilize it in ways that are appropriate for their personal, social, and intellectual goals.

3.0 TEACHERS' GUIDE

This environmental awareness curriculum is a set of modules designed for students and teachers of secondary levels of 10, 11 and 12 grades in Liberia. As a curriculum, it serves as a pathway or road map that directs pedagogy in environmental issues. Firstly, it serves as roadmap for teachers to teach topics on environmental awareness. Second, it is serves as pathway for learning and creating awareness among a huge percent of the Liberian population comprised of youth.









3.1 Structure of Curriculum

The curriculum is comprised of modules. Each modules addresses a particular intended learning outcome (ILO) which are summative aspects or "take away" or what is expected to be acquired at the end of the teaching and learning period. The ILOs are in turned supported by learning objectives (LO) which are specific goals for teaching or learning content of a particular topic or concept during a particular sitting.

3.2 Duration of Pedagogy

The duration of the module contents varies across the topics or contents due to priorities or depth as determined by the scope and sequence. While a topic or content may require 45 minutes, another would require 90 minutes or more. The durations are designed in this manner because some pedagogical engagements require group and individual activities that are complex while others are simply didactic lectures and responses.

The curriculum presents exceptional ease of delivery due to cognizance that will be the first time that some teachers could be administering its contents. Each module contains instructional materials including prototype of lesson plans and lesson notes to guide the delivery. While a new teacher might be tempted to remain scripted, there is opportunity for innovation during the delivery.

3.3 Instructional Materials

Learning materials are also available throughout the modules including activity sheets, glossary of relevant terms and "deep learning" pointers. In addition to the curricular content, teachers and students can access the curricular framework to follow the trend and thinking of the developer of the document. It clearly shows the progression in the delivery of the content.

The intent of this curriculum module is not to be presented as a full fledge certificate course in









Environmental Studies; however, the depth of knowledge is adequate to glean content for such a venture, and to design certificated workshop course contents.

3.4 Sample Teaching Strategy

i. Enhanced Lecture

Steps:

- Know your students and have plans to follow with specific objectives
- Emphasis must be placed on the objectives during the lecture
- Write key words on the chalk board that capture the main idea while talking to students to focus
- Engage the students, ask questions for students to answer, prompt them for further details or clarity base on their answers on what you want them to focus on
- Plan an activity for students to do some application of what you just lectured about
- Have a conclusion of the lesson

ii. Demonstration

Steps:

- This is where the teacher performs an instructional activity or process as students observe.
- The aim of the demonstration is to provide students with a concrete illustration of what they are expected to do, how they can best do it, and how they can tell when they have used the skill or ability correctly.
- Demonstration should be followed by giving students an opportunity to practice the skill either individually or in groups.









iii. Independent Practice

Steps:

- Students receive "teacher –led" instructions in small groups, collaboratively
- Review steps, formats, definitions etc. to make instructions clear.
- Students complete task independently.

iv. Free write

Steps:

- Ask student to write as much as they can about a topic for about 5-10 minutes
- Students should not worry about mechanism and spellings, only their Ideas
- Provide opportunity for students to share their ideas.

v. Quick write.

Steps:

- Tell the students you want them write very briefly about topic you will give them. They are
 to write without stopping during the allotted time.
- State the topic
- Time the students as they write. (It may help to give them extra minute.)
- Invite students to share what they wrote.

4.0 BACKGROUND

In line with the mandate given in the Treaty of Amsterdam that environmental protection requirements must be integrated into Community policies, the network of environmental authorities, whose principal objective is to ensure that the environment is taken into account in the measures financed by the Structural Funds, proposes to make the environment an integral part of the schemes co-funded by the European Social Fund over the next programming period (2000-2006).









This environmental awareness module, which will be included in all the training programs co-funded by the European Social Fund (except for those specifically on the environment), marks the first step in this strategy.

We often think that global environmental problems are beyond our control. We feel powerless and are overcome by apathy; we give up and feel that all we can do is to leave it to politicians and technology to find solutions.

However, a large proportion of these problems stem from our consumption and production patterns, where we play the leading role and, therefore, bear prime responsibility. We must accept this responsibility and become involved in seeking solutions in our walks and ways of life. But before we can change things we have to know them and before we can know them we have to understand them.

For this reason, there is a need for a teaching method dealing with real environmental problems and developing in students an ability to make things better and contribute to saving the planet. In this context, trainers play the key role of fostering the learning process and steering it in a direction enabling the students themselves to develop the attitudes and acquire the knowledge needed to attain this end.

We urge trainers to join in attaining the objective set, for the good of mankind, our countryside and our environment. All of us will gain in terms of quality of life.

5.0 OBJECTIVES

The objectives for this secondary school environmental curriculum modules are divided into two components, General and Special. The General Objectives are the overall skills or knowledge









intended or expected to be acquired by the students after participating in a set of lesson activities; the Specific objectives are the skills and knowledge intended or expected to be acquired by taking a particular lesson.

5.1 GENERAL OBJECTIVE (GO)

As determined by the EPA, the general objective of the proposed Consultancy is to develop an Environmental Awareness Module/Curriculum Mainstreaming the Rio Conventions (Climate Change, Sustainable Land Management, and Biodiversity) into Secondary Liberian Schools to develop concern and awareness among secondary Liberian student.

5.2 SPECIFIC OBJECTIVES (SO)

The specific objective of environmental education module is to clearly show to Liberian secondary school students the economic, social, political and ecological interdependence of the modern world, in which decisions and actions by different countries can have international repercussions and help students to develop skills required for making discriminations in form, shape, sound, touch, habits and habitats. Further, to develop ability to draw unbiased inferences and conclusions.

5.3 INTENDED LEARNING OUTCOMES (ILO)

The intended learning outcomes are the sum products of the outcomes. They can be considered the key pedagogic indicators (KPI). As KPI the ILOs show visible signs or future measurability of the learning, skills or knowledge acquired from the teaching. ILOs therefore state how learners will apply the new skills. They also declare what learners will be able to do when they complete exit the immediate learning environment.

The ILO of the whole environmental curriculum module can therefore be summed as follow: At the end of the module lessons, Liberian students in secondary school grades 10th, 11th are motivated and equipped with information to conduct environmental awareness advocacy on behavior change









and consumption patterns thereby promoting sustainable development.in Liberia.

5.3.1 Module I- ILO Survey of environmental concepts and terminology

At the end of the module lessons, students will be able to demonstrate and articulate understanding of the concepts of basic environmental concepts and terminology

5.3.2 Module II- ILO Causes of principal environmental problems and threats to planet Earth

At the end of the module lessons, students will be able to name and articulate how certain human and natural factors cause problems and threats to their environments.

5.3.3 Module III-ILO Institutional and social responsibilities to the environmental crisis

At the end of the module lessons, students will demonstrate awareness of the three Rio

Conventions, other global and national protocols, and actions taken towards mitigating environmental problems and problems and threats to their communities.

5.3.4 Module IV-ILO Spotlight on the Environmental Protection Agency (EPA)

At the end of the module lessons, students will be able to explain the current status and mandates of the Environmental Protection Agency (EPA) of Liberia









6.0 PEDAGOGIC RECOMMENDATIONS FOR TEACHERS

6.1 KWL Process

It is recommended that all module lessons should follow the KWL format for teaching and learning as follow:

K-KNOW

Teachers should introduce activities to assess what students KNOW about the topic to be discussed. It is recommendable to start with the students' own previous experience, knowledge and everyday life.

W-WANT STUDENTS TO KNOW

Teachers should introduce what the teacher wants them to know

L-LEARN

Teachers should teach or introduce activities designed towards what students will learn at the end of the lesson session

It is recommended that environmental awareness present throughout the course, permeating the entire educational process.

It is recommended that to attain the objective of environmental awareness, question-and-answer methods and active participation should be used wherever possible.

6.2 ABC Sample Lesson Plan Format

The ABC lesson format is approved by the by the Ministry of Education of Liberia for all teachers to utilize as









follow:

Lesson Plan Activities Stage 1

A ANTICIPATION

Activities or formative assessment activities that will make students ANTICIPATE the learning before the class starts.

Lesson Plan Activities Stage 2

B BUILDING KNOWLEDGE

Activities that teachers introduce the acquisition of new knowledge or the learning the teacher plans to deliver

Lesson Plan Activities Stage 3

C CONSOLIDATION

Activities that teachers introduce to consolidate or reinforce the instruction and the learning; the summary and/or assessment of the learning that is supposed to take place during the session.









7.0 IMPLEMENTATION STRATEGY

7.1 MODULE I: Survey of Environmental Concepts & Terminology

7.1.1 MODULE I Lesson Objective

To introduce students to key basic environmental concepts and terminology

- (1) To draw a distinction between various concepts and terms commonly used in connection with the environment:
 - (a) Clarification of concepts such as nature, ecology, environment, natural environment, flora, fauna, etc.
- (2) Sustainable Land Management Concepts: To understand the relationship between the environment and economic and social development:
 - (a) principal characteristics of the current development model: economic growth, international inequalities, unlimited consumption, population and resources;
 - (b) consequences of the current development model: degradation of living conditions and the environment;
 - (c) towards a sustainable development model;
- (3) Introduction to development of advocacy and awareness campaign planning on environmental protection.









Grade Level: 10th

Duration: 180 minutes and 1 hour (See Appendix X: Module II framework)

7.1.2 MODULE I Instructional materials

7.1.2a Instructional Framework 1.2a: Survey of Environmental Concepts and Terminology

MODULE # I	PEDAGOGICAL DETAILS		
TOPIC	Distinction between various concepts and terms commonly		
	used in connection with environment: Sustainable Land		
	management (SLM)		
INTENDED LEARNING	At the end of the module lessons, students will be able		
OUTCOME	to demonstrate and articulate understanding of the		
	concepts basic environmental concepts and terminology		
PEDAGOGICAL POINTER	Environmental		
	awareness is to		
	understand the		
	fragility of Food production Food productio		
	our environment and the importance of its protection.		
	Promoting environmental awareness is an easy way to		
	become an environmental steward and participate in		
	creating a brighter future for our children.		
GENERAL OBJECTIVE	To introduce students to basic environmental concepts and		
	terminology		
CONTENT DESCRIPTION	Lesson activities on distinction between various concepts and		









	terms commonly used in connection with the environment
	Lesson activities on the relationship between the
	environment and economic and social development
	Introduction to the development of environmental awareness
	advocacy on relevant environmental issues
PROPOSED LEVEL	Tenth (10 th) Grade
DURATION	180 minutes (Minimum two sessions of maximum 90 minutes
	each)

7.1.2b Instructional Material # 1.2b: Environmental Concepts & Terminology

HANDOUT # 1.2b	BASIC ENVIRONMENTAL CONCEPTS AND TERMINOLOGY
ENVIRONMENT	Animate and inanimate surroundings in which beings live. It includes human beings, animals, plants, objects, water, soil, air and interrelations between them plus aesthetic, natural science and cultural history values.
ECOSYSTEM	Clearly distinguishable unit within the biosphere, for example a wood, pond or river together with the associated plants and animals (biotic community). Self-regulating system sustained by the interactions between the abiotic (non-living) and biotic (living) factors.
ECOLOGYh	Study of the relationships between living organisms and their abiotic









	surroundings (environment)
FLORA	Community of plant species living at a particular site.
FAUNA	Community of animal species living at a particular site.
HABITAT	Dwelling place of a species of plan
	animal.
BIODIVERSITY	Variety of life on earth. This can be described in terms of genes, species
	and ecosystems.
POLLUTION	Any type of impurity, material or physical influence (such as noise or
	radiation) in a specific environment above normal levels which could
	endanger or damage the ecosystem.
POLLUTANT	Undesired substance in any environment which prevents or disturbs
	organisms' life and has an adverse effect on materials and the
	environment itself.
EMISSION	Discharge of gases, liquids or particles into the water, soil or air.
IMPACT	Effect of a given act on the environment.
DISCHARGE	Flow of liquid, solid or gaseous wastes into the environment.
WASTE	Any substance or object which the owner disposes of or intends
	or is under an obligation to dispose of.
RECYCLING	Return of waste products or components thereof to industrial activity
	to save raw materials and energy.
RENEWABLE ENERGY	Energy obtained from inexhaustible or renewable sources.
	Renewable energy harnesses the wind (wind power), water
	(hydroelectricity), sun (solar energy), etc.









SUSTAINABLE	A term which first appeared in the Brundtland report entitled "Our
DEVELOPMENT	common future" (United Nations World Commission on Environment
	and Development, 1987) which defined it as development that meets
	the needs of the present without compromising the ability of future
	generations to meet their own needs.
POLLUTER PAYS	The principle, enshrined in Article130r of the Maastricht Treaty, that
PRINCIPLE	anyone causing pollution must pay for the resultant damage to the
	environment. In line with this principle, persons responsible for a
	pollution incident must pay the costs of all measures necessary to end
	it or reduce it to a legally admissible level.
Reference	https://www.epa.ie/footer/a-zglossaryofenvironmentalterms/

7.1.2c Instructional Material # 1.2c Environment and Economic & Social Development

HANDOUT # 1.2c	RELATIONSHIP	BETWEEN	THE	ENVIRONMENT,	ECONOMIC	AND
	SOCIAL DEVELO	PMENT				

Awareness of environmental problems has changed enormously in recent years. From a minority concern for species and habitats in the middle of the 20th century, today it has turned into a central issue in a global debate on the future ofmankind.

It is clear that environmental problems stem from the use made of natural resources by society and that pollution is the result of inefficient production methods and literally









unsustainable lifestyles.

Over and above this reality, there is the social and environmental situation in other countries which still have great wealth in terms of biodiversity but whose citizens live in misery. This therefore takes us on to social issues: justice, efficiency and democracy.

Cooperation between states is therefore essential, first to end poverty as a *sine qua non* for sustainable development and, second, to avoid and repair environmental degradation on the planet by pooling know-how and technology.

At the same time, at national level states must shape efficient environmental policies setting out the environmental objectives and priorities. As clearly stated in Article 6 of the Amsterdam Treaty, these policies must be integrated in all other sectoral policies with the objective of reflecting environmental concerns in all areas of society.

Reference: https://www.researchgate.net/figure/Relationship-between-social-economic-and-

ecological-environmental-development

7.1.2d Instructional Material #1.2d Introduction to advocacy and awareness campaign planning on environmental protection.

HANDOUT #	‡1.2d			Using Advocacy to help protect the environment
Definition	and	concept	of	What is advocacy?
Advocacy				Advocacy is about influencing people, policies, structures
				and systems in order to bring about change. It is about
				communicating with those in power and persuading them









to act in more just and equitable ways. At the core, it is about building relationships. It is about tackling the root causes of poverty and promoting justice. Advocacy can be done by, with, or on behalf of, those affected by injustice. Anyone can carry out advocacy work – it should not be left to professionals or experts.

Example of Advocacy

An example of an advocate is Queen Esther in the Bible. The people asked her to represent the Jews before the King because she had the relationship with him. She had the potential to influence him for the greater good. Like her, we can influence people in power when we have a relationship with them and the potential to influence them.

Environmental Advocacy

Example of Environmental Advocacy:

If a community is suffering because of environmental pollution by a local factory, or by waste disposal, it may be appropriate to address the problem through advocacy work. Advocacy work at the local level would involve influencing the decision-makers through showing them the impact of the pollution, and asking them to stop the pollution. This can be done positively by explaining the health benefits of no pollution. At the national level, advocacy might involve asking for changes to the laws related to pollution by industry.

Advocacy Opportunities

Advocacy involves action or processes that can









complement other development work. It is critical in relation to environmental issues because many environmental problems cannot simply be addressed by good development practice within communities.

As climate change is a global problem, governments around the world are working together to find solutions. Development organizations can support national governments by carrying out research and collecting data related to local impacts of climate change. There may be opportunities for some organizations to attend international meetings to talk to delegates from many different countries about the problem of climate change.

Sand mining in Liberia, garbage disposal sites, air pollution caused by defective vehicles, etc.

Advocacy and sustainable management of natural resources

Issues

Good management of forests, fresh water, pastures, soils and other resources is essential if communities are to develop in ways that do not damage their natural environment. There is increasing competition for land, wood for fuel or for timber (industry and export) and for water for drinking, agriculture and industry. These challenge efforts to manage the natural environment so that it does not become depleted and damaged.









Advocacy

When deciding to carry out advocacy in relation to this issue, it is very important that the causes of a particular problem impacting a community or country are fully analyzed (see Section 4). Usually, government responsibility for resource management is divided between different departments and administrative levels. Understanding the most effective way to use advocacy is therefore very important. Sometimes resource management issues can result in conflict between local people and large multinational companies, with government sometimes taking the side of the companies. Resource management issues can also cause conflicts within communities as people struggle for scarce resources such as water or land.

Problems related to natural resources are usually interconnected – what happens to forests affects water supplies and soil qualities and so on. Communities may only experience impacts in relation to one resource, but the resources in other communities may also be affected.

Getting involved in advocacy on natural resource management

Advocacy on natural resource management can be an effective area of advocacy work for local communities who may be affected by problems such as the management of surface or ground water, or deforestation. Severe problems arising due to drought and floods, as well as ongoing issues, such as the distribution of water between small farms and commercial enterprises, could be addressed.

- Consider how to develop the capacity of communities that feel strongly about such issues and help them to speak out.
- Consider also how to work with other stakeholders such as people from environmental
 or conservation organizations. Although they may have a different perspective, they
 bring valuable expertise related to managing resources and preserving biodiversity.









- Be aware that the ore complex the issue, the more stakeholders there tend to be. This
 may also mean many conflicting priorities, so be careful when deciding who to work
 with.
- Once you have identified the issues on which to advocate and the causes of the problem, consider the following questions:
- Does the government have national laws to protect forests or land ownership? Or to
 protect and manage lakes, rivers and groundwater? If not, can we campaign for laws to
 be put in place?
- If there are laws, do the authorities have the capacity to implement them and effectively manage natural resources? Is advocacy needed for more funding from government or better regulation about how money is spent? Is there potential to help local authorities understand the issues, so that they can influence the national government about providing the money and spending it wisely?

Advocacy and waste management

Issues

The issue of waste, such as rubbish and excreta, overlaps with natural resource management. If waste is not properly managed it can cause damage to water supplies, reduce soil or air quality waste is not properly managed it can cause damage to water supplies, reduce soil or air quality over time and attract disease carriers such as rats.

Solutions

The best solution to the rubbish problem is to avoid creating it in the first place. However, we all need to produce some rubbish, and disposal of excreta is an issue for every living person.









Waste management is often a challenge. Leaving rubbish on the street can be a health hazard; burning it pollutes the air; dumping it in rivers or lakes pollutes water and can damage fish stocks; and burying it pollutes the soil and the water supply, causing long lasting pollution that is difficult to clean up.

Local and national governments should have clear strategies related to how they deal with rubbish, and how human excreta are processed, to avoid polluting the environment.

Advocacy

Advocacy related to waste management could therefore include ensuring the provision of improved sanitation facilities, or ensuring the safe collection and disposal of rubbish. We can also advocate for a reduction in the amount of rubbish people need to throw away by challenging shops on the amount of packaging (especially plastic) they produce and by encouraging people to recycle their rubbish.

There is often a need for local level education to raise awareness of the need for effective and safe sanitation. We can raise awareness of the need to address the problem of sanitation and encourage advocacy at local and regional level.

Getting involved in advocacy on waste management

When thinking about getting involved in advocacy on waste management, here are some questions you could consider:

- How is rubbish collected and disposed of locally/nationally? Are there laws governing this, and are they enforced? Who is responsible locally, and are they effective? If not, why not?
- Are people aware of the problems caused by dumping rubbish, and do they need to









be educated about the need to protect the environment from pollution?

- How is human excreta dealt with? Who is responsible, and are there any laws in place?
 Are people aware of the health hazards of open defecation?
- Millennium Development Goal (MDG) 7 is about ensuring environmental sustainability. It includes a target to 'Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation'. Micah Challenge is a Christian Alliance working on the MDGs with national campaigns in many countries.
 Why not work with them to ensure the government improves access to safe water and sanitation (www.micahchallenge.org).

Then develop a plan, identifying your goals and targets and work out what advocacy methods are appropriate.

Module-1 Sample Activity	Activities
	Student advocacy projects on environmental protection
	regarding sectoral policies compliance and everyday life.

SAMPLE OF ENVIRONMENTAL JUSTICE ADVOCACY TOOLKIT

Direct Service	Indirect Service	Advocacy	Research
Clean up a block or neighborhood	Using social media, help spread information to other students about a local environmental advocacy group	Attend a local government meeting and/or write a letter to your legislators	Research a local environmental justice issue (include surveys and collected data) and create a fact sheet









7.2 MODULE II: Causes of Principal Environmental Problems and Threats to the Planet

7.2.1 MODULE II Lesson Objectives

To introduce students to a knowledge and understanding of the causes of the principal environmental problems and threats to the planet

- (1) Introduction to the causes of air pollution: the greenhouse effect; (a) (b) acid rain; the hole in the ozone layer; (c) other forms of air pollution. (d) (2) Introduction to the causes of water pollution: (a) urban discharges; (b) industrial discharges; agricultural discharges. (c)
- (3) Introduction to the causes of soil pollution:
 - (a) urban waste;
 - (b) packaging;
 - (c) industrial waste (non-hazardous, hazardous, toxic and radioactive);
 - (d) agricultural wastes;
 - (e) medical wastes.









- (4) Introduction to the causes of deterioration of the natural environment:
 - (a) global loss of biodiversity;
 - (b) depletion of natural resources;
 - (c) deforestation;
 - (d) desertification;
 - (e) natural disasters.

SAMPLE GUIDING LESSON ACTIVITY:

Student advocacy projects on environmental protection regarding causes and threats to environment and everyday life

Grade Level: 11th

Duration 360 Minutes (See Appendix XX: Module II framework)

7.2.2 MODULE II Instructional materials

7.2.2a Instructional Framework 2.2a: Causes of Environmental Problems & Threats to Earth

MODULE # II	DETAILS
TOPIC-II	Causes of the principal environmental problems and threats
	to the planet: Natural & Anthropogenic
INTENDED LEARNING	At the end of the module lessons, students will be able
OUTCOME	to name and articulate how certain human and natural
	factors cause problems and threats to their









	environments.
PEDAGOGICAL POINTER	Natural occurrences and increasing human population
	and their anthropogenic activities, such as land use,
	deforestation, industrialization, transportation, solid
	waste generation, and excess waste water generation,
	are changing the natural structure of the planet Earth.
GENERAL OBJECTIVE	To introduce students to a knowledge and
	understanding of the causes of the principal
	environmental problems and threats to the planet
CONTENT DESCRIPTION	Lesson and assessment activities on the causes of air
	pollution
	Lesson and assessment activities on the causes of water
	pollution
	Lesson and assessment activities on the causes of soil
	pollution
	Lesson assessment activities on Anthropogenic pollution
	Introduction to the development of environmental
	awareness advocacy on relevant environmental issues
PROPOSED LEVEL	Eleventh (11 th) Grade
DURATION	360 minutes (Minimum four sessions of maximum 90
	minutes each)

7.2.2b Instructional material #2.2b: Causes of Environmental Problems & Threats to Earth

HANDOUT# 2.2b	Causes of the principal environmental problems and threats to planet
	earth









Discussion Point:

The air is the natural resource on which environmental problems have the most tangible impact. Every day, enormous quantities of polluting gases are emitted into the air. The effects which they can have all over the world vary widely, both at local level (at the emission site) and on global scale. Some of the most representative and, at the same time, most damaging include:

Greenhouse Effect, Water Pollution, Urban Discharges, Industrial Discharges, Discharges From Agriculture Waste,

7.2.2c Instructional Material #2.2c: Introduction to the causes of air pollution

HANDOUT # 2.2c AIR POLLUTION

GREENHOUSE EFFECT

The greenhouse effect is a natural phenomenon in the atmosphere, in which the earth's surface reflects only part of the solar energy coming into contact with it and absorbs the rest.

This absorption has a warming effect, in the form of irradiation of energy to the atmosphere. However, on its way through the atmosphere this radiation collides with other gases which slow it down and prevent the energy from escaping to the outside. Instead, it returns to earth, warming up the planet's surface even further.

This produces the "global warming" effect (approximately 4°C over the last 100 years). This results in thawing of the polar regions, thus raising the average sea and ocean levels which, in









turn, is already beginning to have serious consequences in certain parts of the planet (floods, cyclones, coastal erosion, etc.).

The principal gases causing the greenhouse effect are:

- carbon dioxide (CO₂) from combustion of fossil fuels, emissions from motor vehicles and industry, etc.;
- CFCs and HFCs from aerosols, air conditioning systems, refrigerators, etc.;
- methane (CH₄) from agricultural waste.

Since the sources of these greenhouse gases are known, corrective action can be taken: reduction of emissions by means of filters, use of alternative transport, etc.

ACIDIFICATION: Acid rain

Acids form in the atmosphere when water vapor is mixed with gases emitted by industry. They fall back to earth in the form of rain, leading to acidification of soil and water, loss of farmland, trees and woods, erosion, etc. This phenomenon can occur far from the emission source (the USA is suffering from pollution from Northern Europe). Consequently, the effects are felt over a very wide area.

The principal gases causing acidification are:

- sulphur compounds (SO₂);
- nitrogen compounds (NO).

OZONE HOLE

The upper atmosphere contains abundant supplies of ozone (O₃), the gas protecting the









earth against ultraviolet radiation. The introduction of new man-made compounds such as fertilizers is reducing the ozone concentration in the atmosphere, allowing more ultraviolet rays to penetrate, with grave consequences for plant and animal life and potentially causing skin cancers, genetic mutations, etc.

The principal causes of depletion of the ozone layer are:

- artificial sources of chlorine and bromine, which are present in industrial and household refrigerators, aerosols, etc.;
- oxides of nitrogen (NO_x), found principally in fertilisers.

7.2.2d Instructional Material # 2.2d Introduction to the causes of water pollution

HANDOUT # 2.2d

WATER POLLUTION

URBAN DISCHARGES

Sewage systems (cesspools, septic tanks, sewers), domestic activities, landfills for solid urban waste and spreading of effluent or sewage sludges on land.

INDUSTRIAL DISCHARGES

Pollution by wastewaters, effluent, discharges or storage of solid waste, smoke, raw materials









storage and transport, accidents and leaks.

AGRICULTURAL DISCHARGES

Occurs principally as a result of massive use of chemical fertilizers and pesticides in agriculture. This results in diffuse pollution, in contrast to urban pollution which can be considered point source pollution.

7.2.2e Instructional Material # 2.2e Introduction to the causes of soil pollution

HANDOUT # 2.2e | SOIL POLLUTION

SOIL POLLUTION

This applies to the part of the soil where quality has deteriorated as a result of direct or indirect point source discharges of toxic and hazardous wastes or products. These discharges result in concentrations of certain substances which turn the soil toxic, insalubrious, dangerous or unfit for certain uses.



Today some contaminated sites have been abandoned, while others are still in use, the most important being uncontrolled landfills predating the legislation on toxic and hazardous wastes.

The problems which soil pollution can cause are as diverse as the substances in the landfills. Generally, they can give rise to the following damage and risks:

gravely endanger performance of the basic functions of the soil;









- pollute groundwater, surface water and the air;
- cause poisoning due to direct contact or through the food chain;
- cause fires as a result of explosions, etc.

WASTE

Waste is one of the principal causes of soil pollution. Waste treatment is one of the key points in environmental legislation as the volume of waste generated has been increasing alarmingly over the last 20 years.

There are various types of waste:

URBAN WASTE

This covers waste generated in urban areas in the course of the inhabitants' everyday activities (shops, offices, services, homes, etc.) This is commonly known as "refuse". Estimates suggest that 1 kilogram of waste is generated per inhabitant per day. Given the great quantity of waste generated every day, proper management, i.e. perfectly organized collection, transport and treatment with the support and collaboration of the public (selective collection) is indispensable.

Glass, paper and organic matter (food leftovers) are each collected in separate circuits. That leaves the problem of collection of the different types of plastics and tetrapacks. Rules were recently adopted on these as well in the form of Law 11/1997 of 24 April 1997. This extremely important piece of legislation is the first to impose an obligation to find an outlet other than landfills for these materials.

PACKAGING

Why packaging is bad for the environment?









Plastic packaging is extremely wasteful and impacts earth's ecosystems on which we depend. Due to poor product design and lack of political infrastructure, the majority of plastic waste is sent to landfills or disposed of into the environment.

Are the chemicals used in food packaging harmful to human health?

Synthetic chemicals used in the packaging, storage and processing of foods might be harmful to human health because most of these substances are not inert and can leach into the foods we eat.

<u>INDUSTRIAL WASTE</u>

Industrial installations produce two types of waste:

- inert or semi-urban waste; and
- toxic and hazardous wastes with one or more of the following characteristics: inflammable, irritant, harmful, toxic, carcinogenic, corrosive, infectious, etc. Wastes of this type must be dealt with by an authorized manager who will dispose of them in secure landfills licensed for the purpose.

AGRICULTURAL WASTES

Wastes generated by farming could potentially cause pollution since they contain products which could be dangerous or affect the environment in various ways.

Like urban waste, wastes of this type are not governed by any specific rules. In practice, however, they are treated differently from ordinary municipal waste, in that most of the waste can be re-used on the farms themselves.









MEDICAL WASTES

Hospitals generate large quantities of waste every day (3.5 kg per bed per day), posing the risks of infection (biological medical wastes) and pollution (chemical and radioactive wastes).

Given the variety and danger of medical wastes, every hospital must have an in-house waste management plan so that it can classify each type of waste generated and deal with it appropriately.

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7.2.2e Instructional Material # 2.7 Introduction to the causes of deterioration of the natural environment

HANDOUT # 2.7

NATURAL ENVIRONMENT

"Natural environment

-means all that is created from nature, that surrounds human beings, where they live, and where they conduct their daily lives, work life, and actions, and from which they use elements, such as oil and various other resources, to create their own life,

The natural environment consists of land, water, air, plants, and animals. Thus, natural environment refers to both biotic (plants and animals) and abiotic (land) conditions that exist on the earth



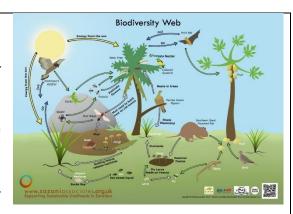






Global Biodiversity loss

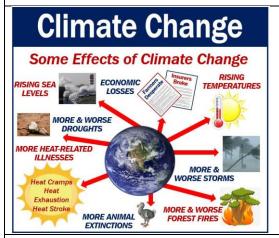
-includes the <u>extinction</u> of <u>species</u> (plant or animal) worldwide, as well as the local reduction or loss of species in a certain <u>habitat</u>, resulting in a loss of biological diversity.



The latter phenomenon can be temporary or

permanent, depending on whether the <u>environmental degradation</u> that leads to the loss is reversible through <u>ecological restoration</u>/<u>ecological resilience</u> or effectively permanent (e.g. through <u>land loss</u>). Global extinction has so far been proven to be irreversible.

Even though permanent global species loss is a more dramatic phenomenon than regional changes in species composition, even minor changes from a healthy stable state can have dramatic influence on the <u>food web</u> and the <u>food chain</u> insofar as reductions in only one species can adversely affect the entire chain (<u>co-extinction</u>), leading to an overall reduction in <u>biodiversity</u>, possible <u>alternative stable states</u> of an ecosystem notwithstanding. <u>Ecological effects of biodiversity</u> are usually counteracted by its loss. Reduced biodiversity in particular leads to reduced <u>ecosystem services</u> and eventually poses an immediate danger for <u>food security</u>, also for humankind..



There are five major causes of biodiversity loss: <u>Climate change</u>

Overall, climate is a major factor in the distribution of species across the globe; climate change forces them to adjust. But many are not able to cope, causing them to die out.

Deforestation and habitat loss









Deforestation is a direct cause of extinction and loss of biodiversity. An estimated 18 million acres of forest are lost each year, due in part to logging and other human practices, destroying the ecosystems on which many species depend. Tropical rainforests in particular, such as the Amazon, hold a high percentage of the world's known species, yet the regions themselves are in decline due to humans.

Overexploitation

Overhunting, overfishing and over-harvesting contribute greatly to the loss of biodiversity, killing off numerous species over the past several hundred years. Poaching and other forms of hunting for profit increase the risk of extinction; the extinction of an apex predator — or, a predator at the top of a food chain — can result in <u>catastrophic consequences</u> for ecosystems.

Invasive species

The introduction of non-native species into an ecosystem can threaten endemic wildlife (either as predators or competing for resources), affect h

Pollution

From the burning of fossil fuels (releasing dangerous chemicals into the atmosphere and, in some cases, depleting ozone levels) to dumping 19 billion pounds of plastic into the ocean every year, pollution completely disrupts the Earth's ecosystems. While it may not necessarily cause extinction, pollutants do have the potential to influents species' habits

Depletion of natural resources

Resources depletion refers to the situation where the consumption of natural resources is faster than it can be replenished. The natural resources of a nation can be divided as renewable resources and non-renewable resources. The natural resources contribute at large to the economic development of a nation.

Deforestation

Deforestation is the permanent removal of trees to make room for something besides











forest. This can include clearing the land for agriculture or grazing, or using the timber for fuel, construction or manufacturing. Forests cover more than 30% of the Earth's land surface, according to the World Wildlife Fund.

Direct causes of deforestation are agricultural expansion, wood extraction (e.g., logging or wood harvest for domestic fuel or charcoal), and infrastructure expansion such as road building and urbanization. Rarely is there a single direct cause for deforestation.

Desertification

Desertification refers to the persistent degradation of dryland ecosystems by climatic variations and human activities. It occurs on all continents (except Antarctica) and affects the livelihoods of millions of people, including a large proportion of the poor in drylands.



Desertification reduces the ability of land to support life, affecting wild species, domestic animals, agricultural crops and people. The reduction in plant cover that accompanies desertification leads to accelerated soil erosion by wind and water.

Natural disasters

A natural disaster is a major <u>adverse event</u> resulting from <u>natural processes</u> of the <u>Earth</u>; examples are <u>floods</u>, <u>hurricanes</u>, <u>tornadoes</u>, <u>volcanic</u> eruptions, earthquakes, tsunamis, storms, and other geologic processes. A natural disaster









can cause loss of life or damage property,[1] and typically leaves some economic damage in its wake, the severity of which depends on the affected population's <u>resilience</u> (ability to recover) and also on the infrastructure available.[2]

A natural disaster is a major adverse event resulting from natural processes of the Earth; examples are floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, storms, and other geologic processes.

Module-2 Sample Activity	Student advocacy projects on environmental	
	protection regarding causes and threats to	
	environment and everyday life	









7.3 MODULE III: Institutional & Social Responses to Environmental Crisis

7.3.1 MODULE III Lesson Objective

To introduce students to a knowledge of the institutional and social responses (international and national) to the environmental crisis

- (1) To be able to name and explain the roles and essence of the most important environmental policy programs:
 - (a) international: Rio Conference and fifth Community program;
 - (b) national: water management plan, biodiversity strategy, etc.
- (2) To be able to name and explain the roles and essence Idem on social and public responses:
 - (a) good industrial practice. Environmental quality certificates;
 - (b) idem for agriculture;
 - (c) idem for tourism and sport;
 - (d) idem for households

SAMPLE LESSON ACTIVITY:

Students, individual and group awareness advocacy innovative initiatives and projects on environmental protection regarding causes and threats to environment and everyday life.

Grade Level: 12th

450 minutes (See Appendix XXX Module III Framework)









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7.3.1 MODULE III Instructional Materials

7.3.1a Instructional Framework 3.2: Institutional and Social Responses

MODULE # III	DETAILS		
TOPIC –III	Institutional and Social Responses to the Environmental		
	Crisis		
INTENDED LEARNING	At the end of the module lessons, students will		
OUTCOME	demonstrate awareness of global and national		
	protocols and actions taken towards mitigating		
	environmental problems and problems and threats to		
	their communities.		
PEDAGOGICAL POINTER	The aim of "The Earth Summit" of 1992 was to put the		
	concept of sustainable development at the forefront of		
	our concerns and to seek common action to protect the		
	planet from environmental degradation that even		
	threatens to change the global climate.		
	Key results of The Erath Summit were the Three Rio		
	Conventions with their relevant protocols		
GENERAL OBJECTIVE	To introduce students to a knowledge of various		
	Institutional and Social Responses to the Environmental		
	Crisis		
CONTENT DESCRIPTION	History and achievements of the 1994 Earth Summit;		
	Legal responses and the economic resources currently		
	earmarked for environmental projects;		









	Legal responses and the economic resources currently		
	earmarked for governmental and non-governmental		
	organizations working most directly on environmental		
	issues;		
	Legal responses and the economic resources currently		
	earmarked for the most important environmental policy		
	programs;		
	Legal responses and the economic resources currently		
	earmarked for social and public responses;		
	Introduction to the development of environmental		
	awareness advocacy on relevant environmental issues;		
PROPOSED LEVEL	Twelfth (12 th) Grade		
DURATION	450 minutes (Minimum five sessions of maximum 90		
	minutes each)		









7.3.1b Instructional Material # 3.3 Roles and essence of the most important environmental policy programs-The Rio Conference

The Rio Conference

The Rio Conference commonly referred to as the **Earth Summit** was created as a response for Member States to cooperate together internationally on development issues after the Cold War. Due to issues relating to sustainability being too big for individual member states to handle, Earth Summit was held as a platform for other Member States to collaborate.

What was the aim of Rio de Janeiro 1992?

The primary objective of the Rio 'Earth Summit' was to produce a broad agenda and a new blueprint for international action on environmental and development issues that would help guide international cooperation and development policy in the twenty-first century.

The three Rio Conventions—on Biodiversity, Climate Change and Desertification—derive directly from the 1992 Earth Summit. Each instrument represents a way of contributing to the sustainable development goals of Agenda 21. The three conventions are intrinsically linked, operating in the same ecosystems and addressing interdependent issues.

Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by









organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment.

7.3.1-A Instructional Material # 3.1-A (CBD)

United Nations Convention on Biological Diversity

<u>Convention on Biological Diversity</u>

The Convention on Biological Diversity (CBD) is the international legal instrument for "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources" that has been ratified by 196 nations.

The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from commercial and other utilization of genetic resources. The agreement covers all ecosystems, species, and genetic resources.

Cartagena Protocol

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement on <u>biosafety</u> as a supplement to the <u>Convention on Biological Diversity</u> (CBD) effective since 2003. The Biosafety Protocol seeks to protect <u>biological diversity</u> from the potential risks posed by <u>genetically modified organisms</u> resulting from modern <u>biotechnology</u>.









The Biosafety Protocol makes clear that products from new technologies must be based on the <u>precautionary principle</u> and allow developing nations to balance public health against economic benefits. It will for example let countries ban imports of <u>genetically modified organisms</u> if they feel there is not enough scientific evidence that the product is safe and requires exporters to label shipments containing genetically altered commodities such as corn or cotton.

The required number of 50 instruments of ratification/accession/approval/acceptance by countries was reached in May 2003. In accordance with the provisions of its Article 37, the Protocol entered into force on 11 September 2003. As of July 2020, the Protocol had 173 parties, which includes 170 <u>United Nations member states</u>, the <u>State of Palestine</u>, <u>Niue</u>, and the <u>European Union.[3][4]</u>

Nagoya Protocol

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, also known as the Nagoya Protocol on Access and Benefit Sharing (ABS) is a 2010 supplementary agreement to the 1992 Convention on Biological Diversity (CBD). Its aim is the implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity. It sets out obligations for its contracting parties to take measures in relation to access to genetic resources, benefit-sharing and compliance.

The protocol was adopted on 29 October 2010 in Nagoya, Japan and entered into force on 12 October 2014. As of October 2020 it has been ratified by 128 parties, which includes 127 UN member states and the European Union. The protocol has not yet entered into force in Montenegro.









Concerns have been expressed that the added <u>bureaucracy</u> and <u>legislation</u> could be damaging to the monitoring and collection of biodiversity, to conservation, to the international response to infectious diseases, and to research.

7.3.1-B Instructional Material # 3.1-BUnited Nations Convention to Combat Desertification (UNCCD)

The United Nations Convention to Combat Desertification (UNCCD), adopted in 1994, is the sole legally binding international agreement linking environment and development to sustainable land management.

The Convention's 197 parties work together to improve the living conditions for people in drylands, to maintain and restore land and soil productivity, and to mitigate the effects of drought. The UNCCD is particularly committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation. The UNCCD secretariat facilitates cooperation between developed and developing countries, particularly around knowledge and technology transfer for sustainable land management.

As the dynamics of land, climate and biodiversity are intimately connected, the UNCCD collaborates closely with the other two Rio Conventions; the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), to meet these complex challenges with an integrated approach and the best possible use of natural resources.

The UNCCD aims to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa,









through effective actions at all levels, supported by international co-operation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievements of sustainable development in affected areas.

7.3.1-CInstructional Material # 3.1-CUnited Nations Framework Convention on Climate Change (UNFCCC)

United Nations Framework Convention on Climate Change

The UNFCCC sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Its objectives are to stabilize greenhouse-gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, within a time-frame sufficient to allow ecosystems to adapt naturally to climate change; to ensure that food production is not threatened; to enable economic development to proceed in a sustainable manner.

The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries that have ratified the Convention are called Parties to the Convention. Preventing "dangerous" human interference with the climate system is the ultimate aim of the UNFCCC.

What is the main goal of the United Nations Framework Convention on Climate Change?

United Nations Framework Convention on Climate Change (UNFCCC) One of the three

Rio Conventions, the UNFCCC's ultimate objective is to achieve the stabilization of









greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.

What is the main goal of the United Nations Framework Convention on Climate Change?
United Nations Framework Convention on Climate Change (UNFCCC) One of the three
Rio Conventions, the UNFCCC's ultimate objective is to achieve the stabilization of
greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous
interference with the climate system.

Kyoto Protocol

The Kyoto Protocol is an international <u>treaty</u> which extends the 1992 <u>United Nations</u>

Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce <u>greenhouse gas</u> emissions, based on the <u>scientific consensus</u> that (part one) <u>global warming</u> is occurring and (part two) it is extremely likely that human-made <u>CO₂ emissions</u> have predominantly caused it. The Kyoto Protocol was adopted in <u>Kyoto</u>, <u>Japan</u>, on 11 December 1997 and entered into force on 16 February 2005. There are currently 192 parties (<u>Canada</u> withdrew from the protocol, effective December 2012)[4] to the Protocol.

The Kyoto Protocol implemented the objective of the UNFCCC to reduce the onset of global warming by reducing greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system" (Article 2). The Kyoto Protocol applies to the six greenhouse gases listed in Annex A: <u>carbon dioxide</u> (CO₂), <u>Methane (CH₄)</u>, <u>nitrous oxide (N₂O)</u>, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and <u>sulfur hexafluoride (SF₆)</u>.

The Protocol is based on the principle of common but differentiated responsibilities: it acknowledges that individual countries have different capabilities in combating climate









change, owing to <u>economic development</u>, and therefore puts the obligation to reduce current emissions on developed countries on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere.

History Of Climate Change

History of Climate Change Science

- **1992** The UN Conference on the Environment and Development is held in Rio de Janeiro. It results in the Framework Convention on Climate Change ("FCCC" or "UNFCCC") among other agreements.
- **1995** Parties to the UNFCCC meet in Berlin (the 1st Conference of Parties (COP) to the UNFCCC) to outline specific targets on emissions.
- **1997** In December the parties conclude the Kyoto Protocol in Kyoto, Japan, in which they agree to the broad outlines of emissions targets.
- **2004** Russia and Canada ratify the Kyoto Protocol to the UNFCCC bringing the treaty into effect on 16 February 2005.
- **2011** Canada became the first signatory to announce its withdrawal from the Kyoto Protocol.[18]
- 2012 On 31 December 2012, the first commitment period under the Protocol expired.









7.4 MODULE I: General knowledge of the Environment Protection Agency (EPA)

7.4.1 MODULE IV Lesson Objective

To introduce students to a general knowledge of the environment in their region, province and town

- (1) Survey of the EPA Act
 - (a) Situations that led to the enactment of the EPA Act
 - (b) Discussions over Part II Section 4.1, 4.2, 4.3
 - (c) Research on the local and international features of the EPA Act
 - (d) Lesson discussions on the definitions of terms in the EPA ACT (See Appendix XXX)
- (2) Powers of the EPA
 - (a) Activities over knowledge of Part II, Section 4, 5, & 6
 - (b) Research on organization and administration of the agency; Part III Sections 1-28
- (3) Functions of the EPA
 - (a) Functions of the EPA Part II Section 8
 - (b) National Environmental Policy Council Part II Section 7
- (4) Students individual and group innovative awareness advocacy initiatives and projects on compliance to the EPA ACT.

Grade Level: 10, 11 & 12

Duration: 360 minutes (See Appendix IV Module IV Framework)









7.4.2 MODULE IV Instructional Materials

7.4.2a Instructional Material # 4.2 General knowledge of the EPA Policy

MODULE # IV	DETAILS
TOPIC –IV	General knowledge of the EPA Policy on environment,
	region, province and town
INTENDED LEARNING	At the end of the module lessons, students will be
OUTCOME	introduced to a general knowledge of the environment in
	their region, province and town
PEDAGOGICAL POINTER	Mandates of the Environmental Protection Agency (
	EPA) of Liberia
GENERAL OBJECTIVE	To introduce students to a knowledge of various
	Institutional and Social Responses to the Environmental
	Crisis
CONTENT DESCRIPTION	Survey of the Environmental Protection Act of Liberia
	Situations that led to the enactment of the EPA Act
	Discussions over Part II Section 4.1, 4.2, 4.3
	Research on the local and international features of the EPA
	Act
	Powers of the EPA
	Activities over knowledge of Part II, Section 4, 5, & 6
	Research on organization and administration of the agency;
	Part III Sections 1-28;
	Functions of the EPA
	Functions of the EPA Part II Section 8









	National Environmental Policy Council Part II Section 7	
	Students individual and group innovative awareness advocacy	
	initiatives and projects on compliance to the EPA ACT.	
PROPOSED LEVEL	Twelfth (12 th) Grade	
DURATION	450 minutes (Minimum five sessions of maximum 90	
	minutes each)	

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7.4.2b Instructional Material # 4.3 The Environmental Protection Act of Liberia

HANDOUT # 4.1b	General knowledge of the EPA
CECTION 4 TITLE	

SECTION 1 TITLE

ENVIRONMENT PROTECTION AGENCY ACT OF THE REPUBLIC OF LIBERIA

An Act to establish a monitoring, coordinating and supervisory authority for the sustainable management of the environment in partnership with regulated Ministries and organizations and in a close and responsive relationship with the people of Liberia; and to provide high quality information and advice on the state of the environment and for matters connected therewith.

WHEREAS Article 7 of Chapter II of the New Constitution of Liberia, which came into force and effect on January 6, 1986, may be interpreted to provide for full public participation of all citizens in the protection and management of the environment and natural resources of Liberia.

EPA Mandates

Environmental Protection Agency

The Environmental Protection Agency was established under the Executive Branch of









Government, an autonomous body to be known as the Environment Protection Agency of Liberia in this Act to be referred to as a body corporate with perpetual succession and a common seal.

Powers of the Agency

EPA is the principal authority in Liberia for the management of the environment and shall coordinate, monitor, supervise and consult with relevant stakeholders on all activities in the protection of the environment and sustainable use of natural resources.

The Functions of the Agency

Among several identified powers, the EPA is empowered to co-ordinate, integrate, harmonize and monitor the implementation of environmental policy and decisions of the Policy Council by the Line Ministries; Propose environmental policies and strategies to the Policy Council and ensure the integration of environmental concerns in overall national planning; Collect, analyze and prepare basic scientific data and other information pertaining to pollution, degradation and on environmental quality, resource use and other environmental protection and conservation matters and undertake research and prepare and disseminate every two years a report on the state of the environment in Liberia.

7.4.2c Instructional Material # 4.4 The Environmental Protection Act of Liberia

 "Administrative Law Judge" means one who preside at an administrative hearing with power to administer oath, take testimony, rule on question of evidence, regulate course of proceedings and make agency determination of fact.









- "Agency" means the Environmental Protection Agency established under section (4) of this Act;
- "Aggrieved parties" means any person who is affected by an act or decision and includes both injuriously affected parties and interested parties.
- "Appointed member" means a member of the Council and of the Board appointed by the
 President of the Republic of Liberia;
- "Biological diversity" means the variability among living organisms from all sources
 including inter alia terrestrial ecosystems and aquatic ecosystems and the ecological
 habitants of which they are part and includes genetic diversity within species, between
 species and ecosystems;
- "Biological resources" include genetic resources, organisms or parts thereof, populations, or any other biotic component or ecosystems with actual or potential use or value for humanity.
- "Board" means the Board of Directors of the Agency established under section (12) of this Act.
- "Chairman" means the Chairman of the Policy Council established under section (7) or Chairman of the Board of Directors of the Agency established under section (12) of this Act to be determined from context.
- "Coastal zone" means any coastal areas declared to be a coastal zone under the laws of Liberia and international law;









- "Council" means the Environmental Policy Council established under section (7) of this Act;
- "County Environmental Committee" means the Coordinating Committee established under section (24) of this Act;
- "County Environmental Action Plan" means the plan established under section (13) of this Act;
- "Developer" means the proponent of a development project or activity that is subject to an environment impact assessment proves;
- "Easement" means the right of use over the property of another for a special purpose;
- "Ecosystem" means a dynamic complex of plant, animal, microorganism communities and their non-living environment interacting as a functional unit;
- Environment" means the physical factors of the surroundings of the human beings, indoors
 and outdoors, including land, water, atmosphere, climate, sound, odor, taste, biological
 factors of animals and plants and the social factors of aesthetics and includes both natural,
 built and cultural/historical environment;
- "Environmental audit" means the systematic, documented, periodic and objectives
 evaluation of how ell environmental organization, management and equipment are
 performing in utilizing and conserving the environment and its resources;
- "Environmental Court: means the Environmental Court established under section (33) of this Act;









- "Environmental easement" means a right created over land to make use lawful for the benefit of the environment.
- "Environmental education" includes the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings;
- "Environmental impact assessment" means a systematic examination of a project or activity that may have adverse and/or significant impact on the environment;
- "Environmental inspector" means a person designated under section (200 of this Act;
- "Environmental management" includes the protection, conservation and sustainable use
 of the various elements or components of the environment, and to direct activities of
 persons for sustainability;
- "Environmental monitoring" means the continuous determination of actual and potential effects of any project, activity or phenomenon on the environment whether short term or long term;
- "Environmental planning" means both long-term and short-term planning that takes into account environmental issues;
- "Environmental resources" means both the renewable or non-renewable resources of the air, land and water including the living resources of flora and fauna and their aesthetical qualities;









- "Environmental restoration order" means an order provided for under section (40) and
 (41) of this Act;
- "Executive Director" means the head of the Agency established under section (16) of this
 Act:
- "Financial year" means the period of twelve months designated by he Government of Liberia as fiscal year;
- "Forests" means the natural resources defined in the National Forestry Law of Liberia;
- "Fund' means the National Environment Fund established under section (45) of this Act; "Genetic resources" means genetic material of actual or potential value;
- "Indigenous" means originating in a particular region or environment and may be used to refer to traditional/local peoples and their practices in respect of their own settings.
- "Intergenerational equity" means that the present generation should ensure that in exercising its right to beneficial use of the environment the health diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- "Line Ministry" means a ministry, agency, statutory corporation or authority in which any law vests or functions for the protection, conservation or management of any segment of the environment or whose activities may have an impact on the environment as defined in this Act;
- "Media specific quality standards" means quality standards for air, water, soil;









- "National Environmental Action Plan" means the plan provided for under section (30) of this Act.
- "Natural resources" include resources of the air, land water, animals and plants including their diversity and aesthetic qualities;
- "Negotiating ministry/agency" means the lead ministry or agency through whom a proposed donor-funded project is to be negotiated and or implemented;
- "Noise" means any sound that is likely to be injurious to human health or the environment;
- "Occupational air quality" means the concentration prescribed under or pursuant to the Environment Protection Law;
- "Occupier" means a person in occupation or control or premises, and in relation to premises different parts of which are occupied by different persons, means the respective persons in occupation or control of each part;
- "Owner" in relation to any premises means-
- The registered proprietor of the premises;
- The lessee, including a sub-lessee of the premises;
- "Ozone layer" means the ozone layer defined in the Vienna Convention for the Protection of the Ozone Layer 1985 the layer of atmospheric ozone above the planetary layer.
- "Person" means any individual, partnership, joint venture, association, or cooperation, trust, estate, government or state, branch, division, instrumentality, authority or agency or any organized group of persons whether incorporated or not.









- "Polluter-pays principle" means generally that environmental management tools such as
 licensing and enforcement are fashioned such that the economic cost of pollution is passed
 on to the polluter and that the cost of cleaning up a segment of the environment damaged
 by pollution, compensating victims of pollution, cost of beneficial uses lost as a result of an
 act of pollution and other costs that are connected or incidental to the foregoing, is to be
 paid or borne by the person convicted of pollution under this Act or any other applicable
 law.
- "Pollution" means an indirect or direct alteration of the physical, thermal, chemical, biological or radio-active properties of a segment of the environment by discharging, emitting or depositing substances or wastes so as —
- To affect any beneficial use adversely;
- To cause a condition which is hazardous or potentially hazardous to public health, safety,
 welfare or, to animals, birds, wildlife, fish or aquatic life or to plants.
- "Practicable" means reasonably practical having regard, among other things, to local
 conditions and knowledge and the term "practicable means" include the provision and the
 efficient maintenance of plants and the proper use thereof, and the supervision by or on
 behalf of the occupier of any process or operation;
- "Precautionary principle" means that where there are threats of damage to the
 environment, whether serious or irreversible, lack of full scientific certainty shall not be
 used as a reason for postponing cost-effective measures to prevent environmental
 degradation;









- "Premises" include messages, buildings, lands, and hereditaments in every tenure and machinery, plant or vehicle used in connection with any trade carried on at any premises;
- "the President" means the President of the Republic of Liberia;
- "Project" includes both project and policy that leads to projects, which have or are likely to have an impact on the environment;
- "Proponent" means a person proposing or executing a project, policy, program or an undertaking specified under section 37 of this Act.
- "Public participation" means, in keeping with the peoples' right to know the potential impacts of decisions being made, the information relating to the right of any person to receive effective notice with relevant information and to review and comment on major decisions with such comments being taken into consideration at the decision making stage; and involves open, ongoing two-way communication, both formal and informal between decision makers and stakeholders those interested in or affected by the decisions.

- "Public record" means a record, memorial of some act or transaction, written evidence of something done, or document, considered as either concerning or interesting to the public, affording notice or information to the public or open to public inspection; any documentation prepared, owned, used or retained by any ministry or agency in pursuance of law or in connection with the transaction of public business;
- "Published notice" means notice that shall be placed in at least one daily newspaper of major national circulation, and/or one newspaper having a district circulation, and shall be broadcast on a popular local station in English and at least one vernacular language relevant to the venue; and shall be disseminated as widely as is practicable by Environmental County officers through the county and district environmental committees, NGOs and CBOs.
- "Regulations" means rules and regulations made under this Act.
- "Standard" means the limits of pollution established under this Act or under the regulations made under this Act or any other law;
- "Sustainable development" means development that meets the needs of the present generation without compromising the ability of future generations to meet their needs by maintaining the carrying capacity of the supporting ecosystems;
- "Sustainable use" means present use of the environment or natural resources which
 does not compromise or impose on the ability to use the same by future generations
 or degraded the carrying capacity of supporting ecosystems;
- "Trust fund" means the Trust Fund established under section 50 of this Act;
- "Waste" means any substance that may be prescribed as waste or any matter, whether liquid, solid, gaseous, or radioactive, which is discharged, emitted or deposited in the environment;

• "Wise use" means sustainable use of natural resources.

8.0 EVALUATION PROPOSAL

The module will be evaluated on the basis of:

- knowledge acquired by the students;
- skills and abilities;
- change of attitudes during the course.

The methods which will be used include the questionnaires, tests, surveys and working classroom or school groups, above all to evaluate the conceptual and procedural content.

- attitude to use of the resources for the course (taking care of material, installations, etc.);
- attitude to waste (volume and final destination);
- attitude to the group as a whole (respect, participation, solidarity, etc.).

What did you find best in the module?

What would you improve?

What effect has this module had on you?

	9.0 AF	PPENDICES	TEACHING AIDS
Appendix A:	Ecos	ystem	
Appendix B:	Prod	luctive Ecosystem	
Appendix C:	Gras	sland Ecosystem	
Appendix D:	Ecos	ystem Services	
Appendix E:	Biod	iversity Web	
Appendix F:	Soil	Functions	
Appendix G-1, 2	Gree	enhouse Effect	
Appendix H-1, 2, 3 & 4	Wat	er Pollution	
Appendix I	Clim	ate Change	

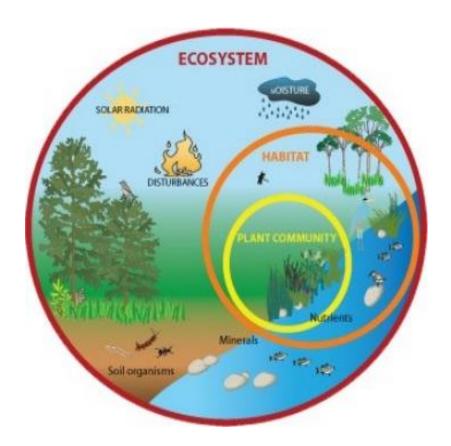
9.1 Teaching Aids

TEACHING AID

APPENDIX A: ECOSYSTEM

ECOSYSTEM at a Glance

An **ecosystem** is a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles and energy flows.

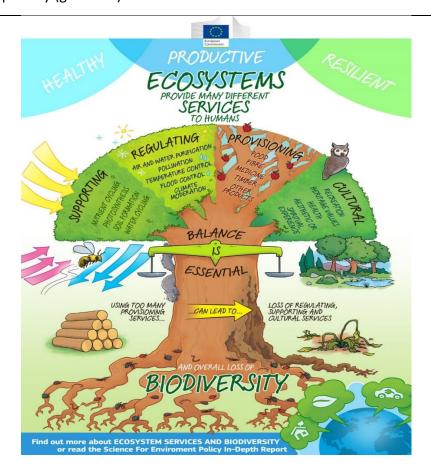


APPENDIX B:

PRODUCTIVE ECOSYSTEM

PRODUCTIVE ECOSYSTEM

In ecology, the term productivity refers to the rate of generation of biomass in an ecosystem, usually expressed in units of mass per volume (unit surface) per unit of time, such as grams per square metre per day (g m^{-2} d^{-1}).

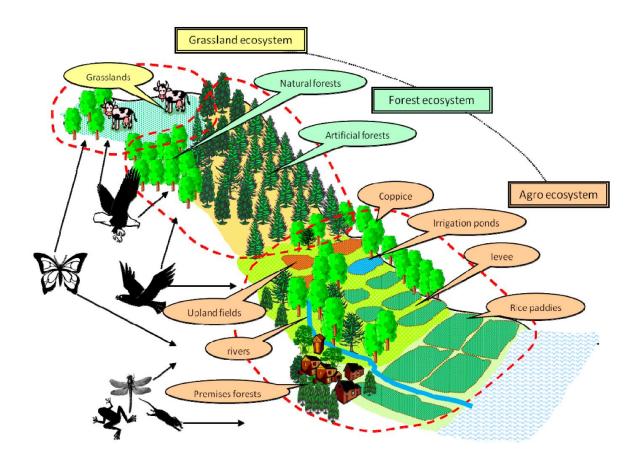


TEACHING AID

APPENDIX C: GRASSLAND ECOSYSTEM

GRASSLAND ECOSYSTEM

Grassland Ecosystem is an area where the vegetation is dominated by grasses and other herbaceous (non-woody) plants. It is also called transitional landscape because **grassland ecosystems** are dominated by the grass with few or no trees in the area where there is not enough for a forest and too much of a forest



TEACHING AID

APPENDIX D: Ecosystem Services

ECOSYSTEM SERVICES

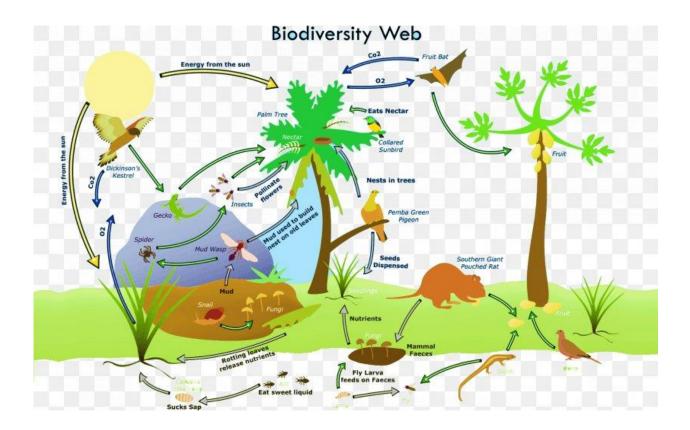
Ecosystem services are the many and varied benefits to humans provided by the natural environment and from healthy <u>ecosystems</u>. Such ecosystems include, for example, <u>agroecosystems</u>, <u>forest ecosystems</u>, <u>grassland ecosystems</u> and <u>aquatic ecosystems</u>. These ecosystems, functioning in healthy relationship, offer such things like natural pollination of crops, clean air, extreme weather mitigation, human mental and physical well-being. Collectively, these benefits are becoming known as 'ecosystem services', and are often integral to the provisioning of clean <u>drinking water</u>, the <u>decomposition</u> of wastes, and resilience and productivity of food ecosystems.



TEACHING AID

APPENDIX E: BIODIVERSITY WEB

BIODIVERSITY WEB

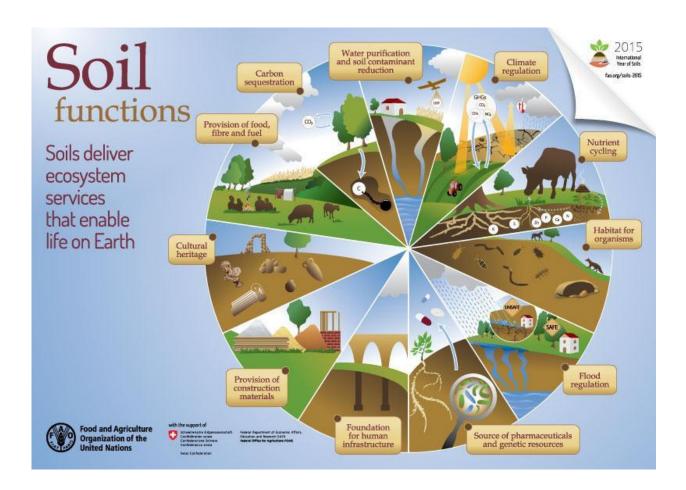


APPENDIX F:

SOIL FUNCTIONS

SOIL FUNCTIONS

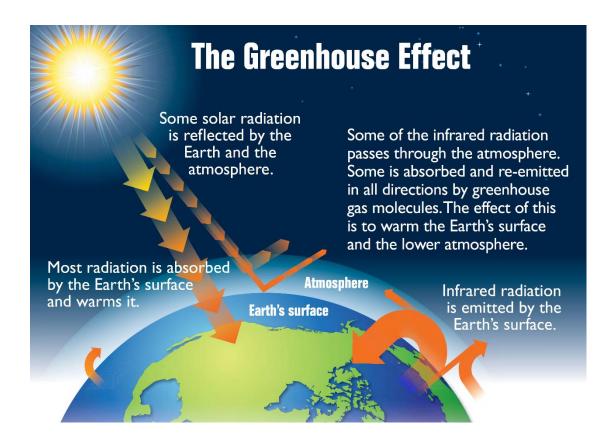
Soil functions reflect the capacity of **soil** to **function** within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation (Mausbach and Tugel, 1995, modified).



THE GREENHOUSE EFFECT

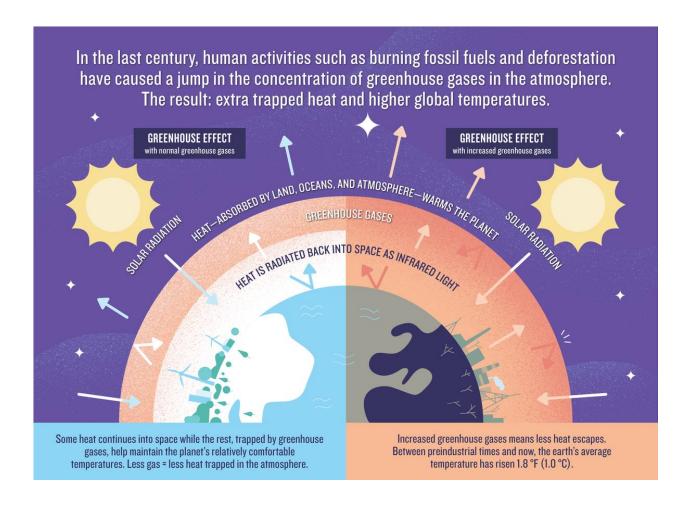
THE GREEN HOUSE EFFECT

The **greenhouse effect** is a natural process that warms the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by **greenhouse** gases. ... The absorbed energy warms the atmosphere and the surface of the Earth.



THE GREENHOUSE EFFECT

THE GREEN HOUSE EFFECT



APPENDIX H-1

WATER POLLUTION

WATER POLLUTION

Water pollution is the contamination of water bodies, usually as a result of human activities. Water bodies include for example lakes, rivers, oceans, aquifers and groundwater. Water pollution results when contaminants are introduced into the natural environment.

Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, **river**, lake, ocean, aquifer, or other body of **water**, degrading **water** quality and rendering it toxic to humans or the environment.





APPENDIX H-3

WATER POLLUTION



APPENDIX H-4

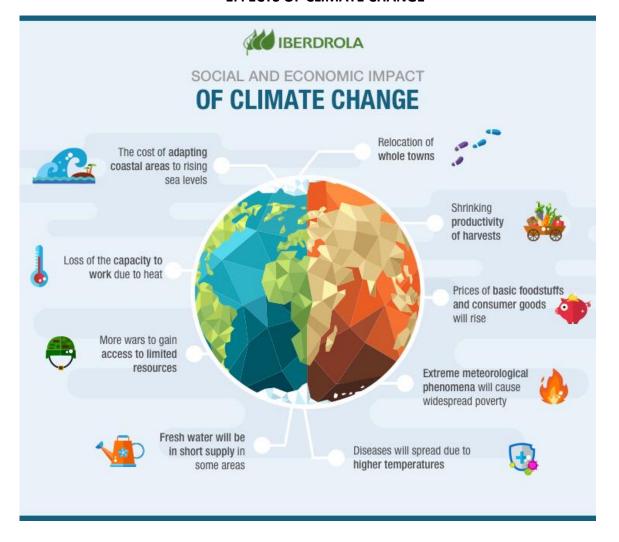
WATER POLLUTION



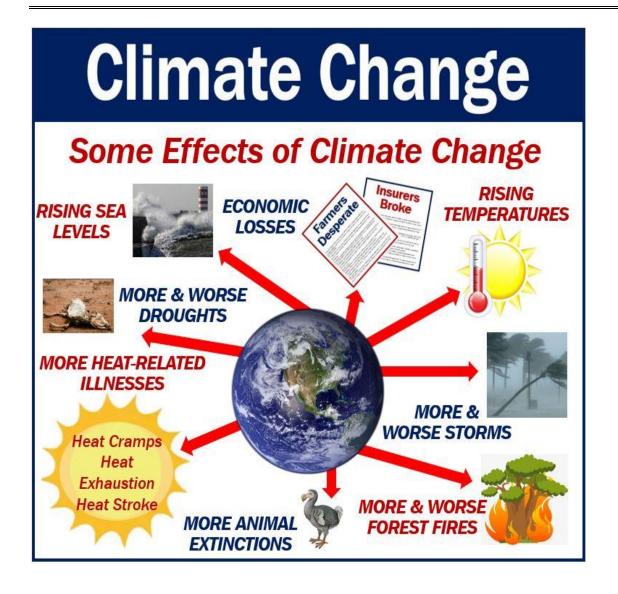
Appendix- I CLIMATE CHANGE

TEACHING AID

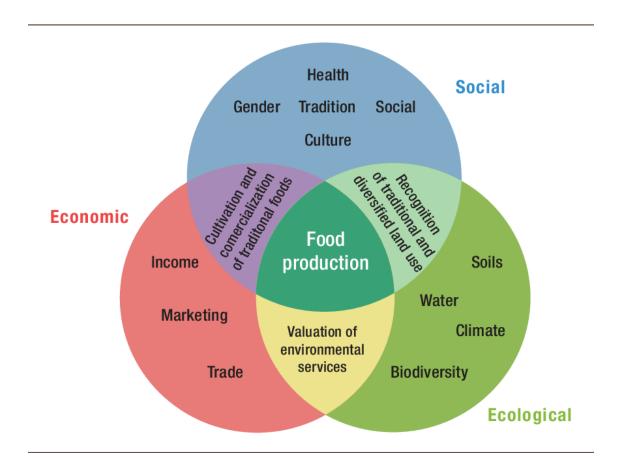
EFFECTS OF CLIMATE CHANGE



EFFECTS OF CLIMATE CHANGE



TEACHING **SUSTAINABLE LAND MANAGEMENT**



TEACHING AID DIMENSIONS OF SUSTAINABLE LAND MANAGEMENT

SOCIAL

- . Building local capacities in SLM management
- Combining local and scientific

knowledge in addressing SLM issues

- Facilitating information sharing and cross-country learning
 - Facilitating multi-stakeholder interaction and action
- Promotion of people- and farmer centered
 research programs

ECOLOGICAL

- Conservation and enhancement of (agro)biodiversity
- Facilitating access to improved genetic resources
 - Rehabilitation of degraded ecosystems

mprovement/management of soil fertility

 Use of appropriate technology in addressing issues of intensification and increasing agricultural production

10.0 BIBLIOGRAPHY AND RESOURCES

https://www.epa.ie/footer/a-zglossaryofenvironmentalterms/

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