



# AWARENESS, ATTITUDE AND PARTICIPATION OF GRADE 10 LEARNERS TOWARD ENVIRONMENTAL CONCERNS: BASIS FOR AN ACTION PLAN

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**Abstract :** This study focused on the awareness, attitude, and participation of Grade 10 learners toward environmental concerns in Schools Division Office I Pangasinan as basis for an action plan during the School Year 2023-2024. It made use of descriptive method with questionnaire as the research instrument. There were 90 Grade 10 learners randomly selected as respondents of the study. The data gathered were properly recorded, tallied, tabulated and interpreted using the SPSS for windows. The study found out that generally, Grade 10 learners have satisfactory performance in Science, parents are high school undergraduate, self-employed, with minimum family monthly income, have mass media like television, radio, and cellular phone at home, and participated in different environmental activities. The Grade 10 learners are moderately aware towards environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems. They also show positive attitude towards environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems. The respondents also moderately participate in environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems. The researcher recommended that environmental education should be intensified in the K to 12 curriculum and should be integrated in all subjects areas especially in Science to promote their higher awareness, develop a highly positive attitude and encouraged high level of participation of students towards environmental concerns especially along terrestrial, aquatic and aerial. Considering the result of the study, the educational system with its present curriculum, should provide students with varied interesting school activities that are suited to them to attain a higher level of awareness, develop a highly positive attitude towards environmental concerns, and enhance their level of participation especially along terrestrial, aquatic and aerial ecosystem. The school should provide access over facilities and information relating to environmental concerns to achieve a higher level of awareness, highly positive attitude, and high level of participation of students towards environmental concerns. The school and the community led by the school officials and community leaders should engage in pro-environmental activities such as environmental campaigns, fun run, beautification program, Earth Day celebration and others to encourage students to ensure high participation level especially along terrestrial, aquatic, and atmospheric ecosystem.

**Keywords:** awareness, environmental concerns, attitude

## INTRODUCTION

Solving the environmental problems that we are facing today requires holistic approaches to analysis and decision-making. Issues such as global climate change, land use change resulting from increasing human population, and long-term anthropogenic impacts on global biogeochemical cycles cannot be considered as isolated problems or individual research topics. To address the full implications of our decisions across local, national, and global scales and multiple human generations we must adopt a broad, systems perspective that incorporates social, environmental, and economic aspects. The U.S. National Research Council has referred to these as “the three pillars of sustainability” (National Research Council, 2011). Recently the concept of ecosystem services, defined as the benefits people obtain from ecosystems, has been used to show how humans benefit from the natural capital provided by the earth (MEA, 2005).

In reality, ecosystems comprise biotic and abiotic components that cannot exist independent of one another, and together provide beneficial services to humans. The term air-ecosystem service is used throughout this discussion to emphasize that the integrated, co-dependent nature of this relationship must be considered. We begin by defining what is meant by the term “air-

ecosystem service.” This is followed by the exploration of a conceptual model detailing the tightly coupled nature of one specific air-ecosystem service; clean air. A crucial step towards the economic valuation of ecosystem services is the quantification of services using metrics that can be linked to economically valued benefits. A regional air quality model that quantitatively defines many aspects of the response of a tightly coupled atmosphere-biosphere system is used to illustrate connections between human behavior and preferences and the underlying ecological processes and functions leading to the production of clean air ecosystem services. This example is followed by a discussion of clean air-ecosystem services in the context of environmental economics and management. (file:///C:/Users/bsf/Downloads/AMAD-12-003%20COOTER\_ET\_AL\_SUBMIT\_V2%20(2).PDF).

The world today is vastly different from what it was before urbanization and industrialization had taken its toll on the world. Since the turn of the new millennium the issue of the environment has suddenly evolved into a widespread issue which is greatly discussed throughout the world. No longer are humans living in a world where the environment is serene or stable but much rather becoming unrecognizable and diminishing before our eyes. The plants, trees and flowers are life forms which God has created for us to enjoy its beauty but it is now solely up to us and many other organizations to protect preserve and respect how fragile our environment really is (Zambrano, 2014).

The daily lives which humans carry on about every day are also a factor influencing on our environment and global warming. By driving cars that have a thirst for petrol we are releasing carbon dioxide and furthermore impacting on the world's climate. In Australia environmental impact has always been evident. Land clearing especially in places such as Queensland has caused land to lay dry and lifeless where all forms of life is destroyed. By clearing land we are not only affecting our climate but are also destroying animal habitat and the usage of the land. Senseless actions by commuters in Australia, emitting tons and tons of lethal gases vulnerable to the atmosphere are starting to take its toll on our climate. We are seeing a harsher climate and at the same time less rain. If we want to preserve our world we must take a stance on this issue and take action for what is right, not carrying on the actions that will lead to a desolate, destroyed Earth (Zambrano, 2014).

Environmental Education is the first step towards the achievement of environmental literacy and offers long-time solution to environmental problems. It is a process that provides learners with awareness and knowledge about the environment (typically including the relationship of humans to the natural world, and fosters the development of skills, attitudes and motivations to enable learners to make informed decisions and take responsible action that incorporate environmental considerations. The ultimate goal or outcome of environmental education is the creation of environmentally literate citizens. Environmental Education is described in Wikipedia as the organized efforts to teach about how natural environments function and how human can manage their behaviour and ecosystems in order to live sustainably within the school system (Zambrano, 2014).

The Tbilisi declaration (1977) noted the unanimous accord in the important role of environmental education in the preservation and improvement of the world's environment. In most parts of the world, environmental education has been one of the major concerns to address the present environmental problems.

The Philippines is considered one of the richest countries in term of natural resources and biological diversity. Almost half of the Philippines total land is densely forested with species-rich ecosystem. It is one of the rare lists of nations that as an entire country is both a hotspot and mega diversity area. In fact the Philippine forests as a whole are habitat for over 6000 plant species and also numerous animal species including the Philippine Eagle and the Visayan warty pig, which are already endangered (Philippine Daily Inquirer, 2011). The country's seas has one of the "world's best coral reefs". It forms an ocean region that has long been recognized as the world's center of marine biodiversity. Together with Papua New Guinea and Australia, the country forms the "Coral Triangle" so-called because of the abundance of its coral reef life. There are 400-500 species in 90 genera of reef-forming corals which are believed to exist in this region ([www.oneocean.org/flash/philippine\\_biodiversity.html](http://www.oneocean.org/flash/philippine_biodiversity.html), 2013).

However, we can see the major change that are evidently occurring in our environment. Next to Singapore, the Philippines have the second lowest forest coverage area in Southeast Asia with only 24 percent. The country's coastal and marine areas are destroyed because around 40 percent of the total coral area is in poor condition. Although the Philippine biodiversity is considered as one of the richest in the world, it is also one of the most threatened (Ignacio, 2013). According to Ignacio (2013), there is a decline of natural resources and biodiversity. Approximately, two-third of the country's original mangroves have been lost, 400 plant and animal species are currently threatened with extinction.

A contributing factor to the different environmental problems is the lack of awareness and knowledge towards environmental concern as well as man's attitude towards his environment. In many countries, lack of environmental knowledge, awareness and attitude at all levels impedes addressing environmental problems in decision-making (Economic Commission for Latin America and the Caribbean, 2002).

Environmental education (EE) is the first step towards the achievement of environmental literacy and offers long-time solution to environmental problems. It is a process that provides learners with awareness and knowledge about the environment, and fosters the development of skills, attitudes and motivations to enable learners to make informed decisions and take responsible actions that incorporate environmental considerations. The ultimate goal or outcome of environmental education is the creation of environmentally literate citizens.

In the Philippines, initiatives and efforts focused mostly on environmental education are being done to address environmental problems. In fact as early as 1977, the Department of Education Culture & Sports (DECS) started integrating environmental education subjects in the school curriculum at all levels and the various government agencies started public information activities to stimulate awareness and encourage involvement in environmental protection ([feed.org.ph/...environmental\\_education.Philippines](http://feed.org.ph/...environmental_education.Philippines)). One of the most important groups who play an important role in saving and protecting the environment are students. Considering the fact that they are regarded as the most powerful stratum of society, students understand the need for protecting environment and they are prepared to fight against the contamination of atmosphere as "today's student is tomorrow's citizen". With their efficient skills of interaction with other parts of the society, they communicate about need for protecting environment. Students, therefore, can play a pivotal role in changing the scenario of protecting environment ([wiki.answer.cam](http://wiki.answer.cam), 2011).

Students' environmental knowledge or awareness is one of the best indicators for showing national civilization (Aminrad, Zakaria and Hadi, 2011). It reflects many aspects of environmental status such as personal consideration and behaviour, public capacity, and the local citizens attitude towards sustainable society as whole (Kaiser, 2003).

#### Environmental Knowledge and Awareness



Environmental knowledge and awareness is described by the Pachamama Alliance (2012) as the understanding of the fragility of the environment and the importance of its protection. One way of becoming an environmental steward is promoting environmental awareness and participating in creating a brighter future for the children. Teaching the people like our friends and family that the physical environment is fragile and indispensable is an integral way of fixing the problems that threaten the environment.

According to Bharambe (2013), students themselves must bring about a positive change & improve their own surroundings and communities by taking the responsibility and become proactive community-minded citizens.

Meanwhile, Yarkandi and Yarkandi (2012) believe that education is a tool that helps people to understand and solve the environmental issues.

According to Hassan and Ratnakar (2012) environmental problems can be best tackled if proper knowledge and awareness towards environment is developed.

One of the major challenges in environmental education is changing people's attitude to be more environmentally friendly. Environmental education should start from earlier of age on younger generation because they are future leaders. Next challenge is creating awareness on the importance of the environment which achieved with technology and also through electronic and printed media (Aminrad, 2012).

The level of environmental knowledge in a population can be very difficult to measure but exposure to the natural environment or a particular place is a strong factor in determining concern for that environment can be measured as an indicator of the potential for increased environmental knowledge. Similarly, environmental programs can help reduce the impacts of human actions on the environment. (State of the Environment, Northwest Territories, 2012).

Environmental attitudes as described by Ugulu et.al (2013) apply to general feelings toward ecology and the environment, feelings and concern for specific environmental issues, and feelings toward actions to give remedies to environmental problems. It is also defined as personal responsibility representing the individual's sense of obligation towards the environment, either in general or to a specific aspect.

### Statement of the Problem

This study sought to assess the level of awareness, attitude and participation of Grade 10 learners of Schools Division Office I Pangasinan relative to environmental concerns during the school year 2023-2024.

Specifically, it sought to answer the following sub-problems:

1. What is the profile of Grade 10 learners of Schools Division Office I Pangasinan in terms of the following:
  - a. academic performance in Science during the school year 2023-2024;
  - b. parents' highest educational attainment;
  - c. parents' occupation;
  - d. family monthly income;
  - e. form of mass media available at home, and
  - f. activities attended/participated related to environmental issues?
2. What is the level of knowledge of the Grade 10 learners relative to environmental issues along:
  - a. terrestrial ecosystem;
  - b. aquatic ecosystem; and
  - c. atmospheric ecosystem?
3. What is the level of attitude of the Grade 10 learners towards the aforementioned environmental issues?
4. What is the level of participation of the Grade 10 learners in activities being conducted to address the aforementioned environmental issues?
5. Based on the findings, what action plan involving the participation of the Grade 10 learners can be proposed to enhance the level of their awareness, attitude and participation relative to the aforementioned environmental concerns?

### METHODOLOGY

This chapter presents the method and procedure to be employed to answer the research problems identified in the study. More specifically, it discusses the research design, sources of data, the instrumentation and data collection, and tools for data analysis.

#### Research Design

Considering the aim of the study which is to determine the level of awareness, attitude and participation of Grade 10 students towards environmental concerns along terrestrial, aquatic and atmospheric ecosystem, the researcher used descriptive method of research. Descriptive method of investigation which is used to obtain information concerning the current status of the phenomena and to describe what exists with respect to variables or conditions in a situation (Key, 1997).

In this study, the level of awareness, attitude and participation of Grade 10 learners towards environmental concerns were determined. Profile of Grade 10 learners of Division of Pangasinan I in terms of academic performance in Science during the previous school year, parents' highest educational attainment, parents' occupation, family monthly income, forms of mass media available at home, and activities attended/participated related to environmental concerns; level of awareness of the Grade 10 students relative to environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystem; level of attitude of the Grade 10 students towards environmental concerns; and level of participation of the Grade 10 students in activities being conducted to address the environmental concerns will be considered the determining factors in measuring the level of awareness, attitude and participation relative environmental concerns were the variables.

#### Instrumentation and Data Collection

The main data-gathering instrument of the study was a questionnaire-checklist. The questionnaire focused on the level of awareness, attitude and participation of Grade 10 students towards environmental concerns.

Part I determined the profile of Grade 10 students of Division of Pangasinan I in terms of academic performance in Science during the previous school year, parents' highest educational attainment, parents' occupation, family monthly income, forms of mass media available at home, and activities attended/participated related to environmental concerns.

Part II determined the level of awareness of Grade 10 learners relative to environmental issues along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystem.

Part III focused on the level of attitude of the Grade 10 learners toward environmental concerns.

Part IV determined the level of participation of the Grade 10 learners in activities being conducted to address the environmental issues.

The instrument was presented to the adviser and members of the research committee for corrections and initial improvements. The content validity of the instrument was tested by presenting it to the experts whose field of specialization is related to the nature of the study.

The researcher sought permission from the Schools Division Superintendent of Pangasinan I to allow the researcher to administer the conduct of the study.

Conduct and administration of the questionnaire to the identified respondents was done personally by the researcher.

**Tools for Data Analysis**

The data that were gathered were analyzed and interpreted using the appropriate statistical tools based on the problem raised.

To answer sub-problem 1 on the profile of Grade 10 learners of Division of Pangasinan I, frequency and percentages were used using the formula below.

Frequency Count & Percentage

$$\text{Percentage} = \frac{F}{N} \times 100$$

Where:

F = Frequency

N = total number of respondents

To answer sub-problem 2 on the level of awareness of the Grade 10 learners relative to environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystem average weighted mean was used using the formula and mean rating below.

Average Weighted Mean

$$\frac{\sum WM}{I}$$

Where:

$\sum WM$  = Weighted Mean

I = no. of items/indicators

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Aware (VA)
4	3.41 – 4.20	Aware (K)
3	2.61 – 3.40	Moderately Aware (MA)
2	1.81 – 2.60	Slightly Aware (SA)
1	1.00 – 1.80	Not Aware (NA)

To answer sub-problem 3 on the level of attitude of the Grade 10 learners towards environmental issues, average weighted mean was used.

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Highly Positive (HPA)
4	3.41 – 4.20	Highly Positive (PA)
3	2.61 – 3.40	Positive (P)
2	1.81 – 2.60	Moderately Positive (MP)
1	1.00 – 1.80	Slightly Positive (SP)

To answer sub-problem 4 on the level of participation of the Grade 10 learners in activities being conducted to address the environmental concerns, average weighted mean was used.

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very High Participation (VHP)
4	3.41 – 4.20	High Participation (HP)
3	2.61 – 3.40	Moderate Participation (MP)
2	1.81 – 2.60	Low Participation (LP)
1	1.00 – 1.80	

**RESULTS AND DISCUSSION**

This chapter deals in the presentation, analysis and interpretation of the data gathered relative to sub-problems in the study. Included in the presentation were the awareness, attitudes and participation of Grade 10 learners on environmental concerns affecting terrestrial, aquatic and atmospheric ecosystems.

**I. Profile of Grade 10 Learners****Table 1a. Academic Performance in Science during the School Year 2023-2024**

Academic Performance	Frequency	Percentage
Outstanding (90 and above)	11	12.22
Very Satisfactory (85-89)	24	26.67
Satisfactory (80-84)	36	40
Fair (75-79)	19	21.11
<b>Total</b>	<b>90</b>	<b>100</b>

It can be seen in Table 1a that most of the Grade 10 learners with 36 or 40% have an academic performance in Science during the School Year 2023-2024 of 80-84 or Satisfactory. This is being followed by 85-89 or Very Satisfactory performance with 24 or 26.67%. There are also 19 or 21.11% who have fair performance or 75-79. On the other hand only 11 or 12.22% have an outstanding performance or 90 and above. This indicates that the Grade 10 students have satisfactory performance in Science.

**Table 1b. Parents' Educational Attainment**

Father's Educational Attainment	Frequency	Percentage
College Graduate	3	3.33
College Undergraduate	19	21.11
High School Graduate	23	25.56
High School Undergraduate	28	31.11
Elementary Graduate	11	12.22
Elementary Undergraduate	6	6.67
<b>Total</b>	<b>90</b>	<b>100</b>
Mother's Educational Attainment	Frequency	Percentage
College Graduate	6	6.67
College Undergraduate	16	17.78
High School Graduate	34	37.77
High School Undergraduate	15	16.67
Elementary Graduate	10	11.11
Elementary Undergraduate	9	10
<b>Total</b>	<b>90</b>	<b>100</b>

**Fathers' Educational Attainment.** The educational attainment of their fathers show that majority of them are high school undergraduates with 28 or 31.11% while 23 or 25.56% are high school graduates. Out of 90, there are 11 or 12.22% who are elementary graduates. There are also 19 or 21.11% who are college undergraduates. It is also reflected in the table that there are only 3 or 3.33% who are college graduates. The result shows that most of their fathers reached up to high school level only because most of them are living near the coastal area where there is a high percentage of poverty.

**Mothers' Educational Attainment.** Most of the respondents' mothers are high school graduates with 34 or 37.77% while 16 or 17.78% are college undergraduates. It can also be noted that 15 or 16.67% are high school undergraduates. Some 6 or 6.67% are college graduates, 10 or 11.11% are elementary graduates and 9 or 10% are elementary level.

**Table 1c. Parents' Occupation**

Fathers' Occupation	Frequency	Percentage
Government Employee	5	5.56
Private Employee	21	23.33
Self-Employed	35	38.89
Overseas Filipino Workers	2	2.22
Unpaid Family Workers	27	30
<b>Total</b>	<b>90</b>	<b>100</b>
Mothers' Occupation	Frequency	Percentage
Government Employee	9	10
Private Employee	19	21.11
Self-Employed	34	37.78
Overseas Filipino Workers	4	4.44
Unpaid Family Workers	24	26.67
<b>Total</b>	<b>90</b>	<b>100</b>

It is revealed in the data that most of the respondents' fathers are working as self-employed with 35 or 38.89%. Next is unpaid family workers with 27 or 30%, private employee with 21 or 23.33%, government employee with 5 or 5.56% and 2 or 2.22% Overseas Filipino Workers.

On the other hand, the mother of the respondents' mothers are working as self-employed with 34 or 37.78%. There are also 24 or 26.67% who are unpaid family workers, 19 or 21.11% private employee, 9 or 10% government employee and 4 or 4.44% Overseas Filipino Workers.

**Table 1d. Family Monthly Income**

Family Monthly Income	Frequency	Percentage
Php20,001-P30,000	12	13.33
Php10,001-20,000	21	23.33
Php10,000 and below	57	63.34
<b>Total</b>	<b>90</b>	<b>100</b>



**Monthly Family Income.** The table shows that out of 90 respondents, 57 or 63.34% have parents' monthly income of Php10,000 and below. Php10,001-20,000 had 21 or 23.33% while Php20,001-P30,000 had 12 or 13.33%.

This indicates that parents, despite the economic crisis the family is faced with, they could still manage to send their children to school. The below average socio-economic status is not a hindrance to good performance. Even a student who belongs to a low socio-economic status can still perform just like any one who belongs to high/above average socio-economic status.

The income of the parents is more important for children at some ages than at others. This is in agreement with the study of Jencks and Meyer (1997) that children from families with low SES have a better image of themselves and do better in academic performance if they do attend school.

**Table 1e. Activities Attended/Participated Related to Environmental Concerns**

Activities Attended	Frequency	Percentage
Tree Planting	67	74.44
Solid Waste Management	59	65.56
“Pera sa Basura” Campaign	38	42.22
“Clean and Green”	49	54.44
Gardening/Beautification	46	51.11
Seminars/Trainings on environmental protection and conservation	18	20

**\*Multiple Responses**

It can be gleaned in Table 1e that most of the Grade 10 students participate in Tree Planting Activity with 67 or 74.44%. This is followed by Solid Waste Management with 59 or 65.56%. Clean and Green with 49 or 54.44%, Beautification and Gardening with 46 or 51.11%, Pera sa Basura Campaign with 38 or 42.22% and Seminars/trainings on environmental protection and conservation. The result show that the Municipality of Sual, Pangasinan where the study was conducted implements different programs and activities on how to protect our environment like the above-mentioned activities.

**II. Awareness of Grade 10 Learners toward Environmental Concerns**

The level of awareness, attitudes and participation of Grade 10 students along environmental concerns such as terrestrial ecosystem is presented on Tables 2a-2c

**Table 2a. Level of Awareness of the Grade 10 Learners Toward Environmental Concerns Along Terrestrial Ecosystem**

Indicators	WM	DE
1. Garbage and trash dumps provide breeding places for disease-carrying animals.	3.56	A
2. Mining activities cause massive landslides.	3.45	A
3. Deforestation disturbs the habitat of wild animals.	3.23	MA
4. Abandoned piles of garbage or open dumps are dangerous to public health.	3.14	MA
5. Pesticide residues are found in the food we eat and can cause cancer.	3.10	MA
6. Inorganic fertilizers contribute to the acidity of a farmland.	3.07	MA
7. Mining exposes toxic substances like asbestos and metallic dust which affect human health.	2.98	MA
8. Use of organic fertilizers increases crop yield without destroying the soil.	2.90	MA
9. Spraying pesticides not only kill pests but also harmless animals.	2.80	MA
10. The use of insecticides causes land pollution.	2.70	MA
<b>WM</b>	<b>3.09</b>	<b>MA</b>

**Legend:**

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Aware (VA)
4	3.41 – 4.20	Aware (A)
3	2.61 – 3.40	Moderately Aware (MA)
2	1.81 – 2.60	Slightly Aware (SA)
1	1.00 – 1.80	Not Aware (NA)

Based from the data in Table 2a, the average weighted mean is 3.09 which is equivalent to a descriptive rating of “Moderately Aware”. From the data, it can be seen that the respondents are aware about garbage and trash dumps provide breeding places for disease-carrying animals it has the highest mean of 3.56. This means that more than 60% of the respondents are aware on this issue.

On the other hand, issue about the mining activities cause massive landslides has the second highest mean of 3.45. It also implies that 40-60% of the respondents know that mining can cause landslide.

Furthermore, some of the respondents have little awareness about the use of insecticides causes land pollution. One reason for this is that since the respondents are studying in a public school, topics about the good and bad effects of insecticides are being emphasized in their science subject.

The result of this study shows that students are aware towards environmental concerns is similar to the findings of Hassan (2013) in his study that learners manifest high awareness on environmental concerns.

**Table 2b. Level of Awareness of the Grade 10 Learners toward Environmental Concerns Along Aquatic Ecosystem**

Indicators	WM	DE
1. Toxic chemicals from factories when carried as run-off to bodies of water are pollutants.	3.71	A
2. Dynamite and cyanide fishing kill even the small fishes.	2.92	MA
3. Mangroves, habitat of young fishes, are destroyed by the irresponsible throwing of solid wastes.	2.78	MA
4. Oil spills from ships harm and kill marine organisms.	2.91	MA
5. Small scale and traditional fishing practices conserve the fish population.	2.65	MA
6. Eutrophication occurs when organic compounds accumulate in bodies of water.	2.67	MA

7. Accumulation of fertilizers that may run-off to rivers, ponds and lakes causes pollution.	2.79	MA
8. The cutting down of mangrove trees for charcoal disturbs the nursery of aquatic organisms.	3.12	MA
9. Collecting corals and shells causes extinction of marine species.	2.88	MA
10. Marine organisms contaminated with pollutants are not to be eaten.	2.65	MA
<b>AWM</b>	<b>2.91</b>	<b>MA</b>

**Legend:**

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Aware (VA)
4	3.41 – 4.20	Aware (A)
3	2.61 – 3.40	Moderately Aware (MA)
2	1.81 – 2.60	Slightly Aware (SA)
1	1.00 – 1.80	Not Aware (NA)

It can be seen from the data on Table 2b that the respondents are “Moderate Aware” on the environmental concerns along aquatic ecosystem as revealed in the average weighted mean of 2.91. Of the fifteen (10) environmental concerns along aquatic ecosystem, it can be noted that the respondents are aware about the negative effects of water pollutants such as toxic chemicals from factories, dynamite and cyanide fishing, and the effects of overfishing. Meanwhile, majority of the indicators along this area were rated moderate aware.

**Table 2c. Level of Awareness of the Grade 10 Learners towards Environmental Concerns Along Atmospheric Ecosystem**

Indicators	WM	DE
1. The ozone layer protects us from ultraviolet radiation.	3.76	A
2. CFCs are compounds use in refrigeration, insulation, foams, and other industrial processes.	3.42	A
3. Burning of plastics destroy the ozone layer.	3.32	MA
4. Extreme weather condition like that of typhoon Yolanda is one of the effects of global warming.	3.21	MA
5. Industrial plants that use coal, oil and gas release carbon monoxide.	3.12	MA
6. A human activity that results to global warming is deforestation.	3.11	MA
7. Aerosol sprays, air fresheners, and disinfectants contain substances that increase greenhouse gases.	3.06	MA
8. Carbon monoxide released from factories is poisonous.	2.98	MA
9. Smoke from vehicles contributes much to air pollution.	2.89	MA
10. Chloroflourocarbons (CFCs) contribute to the destruction of the ozone layer.	2.87	MA
<b>WM</b>	<b>3.17</b>	<b>MA</b>

**Legend:**

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Aware (VA)
4	3.41 – 4.20	Aware (A)
3	2.61 – 3.40	Moderately Aware (MA)
2	1.81 – 2.60	Slightly Aware (SA)
1	1.00 – 1.80	Not Aware (NA)

The data in Table 2c reflect the level of awareness of the Grade 10 students towards environmental concerns along atmospheric ecosystem. Based on the data from the said table, the average weighted mean is 3.17 which is equivalent to a descriptive rating of “Moderately Aware”. The item with the highest mean rating is about the importance of the ozone layer to human life. It appears that the respondents are moderately aware about this concern. One reason for this is that in Science subject specifically in Ecology, the importance of the ozone layer is always given emphasis in the discussion. Aside from this issue, the respondents also show awareness on the causes of the destruction of the ozone layer like CFCs, harmful gases that come from industrial plants and factories, and other causes of air pollution.

**Table 3. Summary of Level of Awareness of Grade 10 Learners towards Environmental Concerns**

Environmental Concerns	WM	DE
Terrestrial Ecosystem	3.09	MA
Aquatic Ecosystem	2.91	MA
Atmospheric Ecosystem	3.17	MA
<b>AWM</b>	<b>3.06</b>	<b>MA</b>

**Legend:**

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Aware (VA)
4	3.41 – 4.20	Aware (A)
3	2.61 – 3.40	Moderately Aware (MA)
2	1.81 – 2.60	Slightly Aware (SA)
1	1.00 – 1.80	Not Aware (NA)

It is shown in Table 3 that the level of awareness of Grade 10 learners towards environmental concerns along Terrestrial Ecosystem, Aquatic Ecosystem, and Atmospheric Ecosystem obtained an overall average weighted mean of 3.06 which is described as moderately aware.

## II. Attitudes of Grade 10 Learners Toward Environmental Concerns

**Table 5. Level of Attitude of Grade 10 Learners toward Environmental Concerns Along Terrestrial Ecosystem**

Indicators	WM	DE
1. Plant trees to prevent soil erosion.	2.99	P
2. Organic fertilizers should be used by farmers rather than inorganic fertilizers because these will not cause harm to the soil.	2.95	P
3. Illegal hunting must be strictly prohibited to prevent wildlife animals from being captured.	2.92	P
4. Farmers should minimize using inorganic fertilizers to restore the fertility of the farmland.	2.89	P
5. Reforestation needs to be done to protect and conserve the habitat of wild animals.	2.75	P
6. Mining activities should be properly monitored and regulated.	2.71	P
7. Proper waste disposal should be practiced to avoid scattering of garbage in dumps.	2.69	P
8. There must be strict implementation of solid waste management to prevent occurrence of dreadful diseases.	2.69	P
9. Mining activities must be limited because of its bad effect to the environment.	2.61	P
10. Illegal logging must be prohibited because this practice contributes to the flash floods.	2.49	MP
<b>WM</b>	<b>2.77</b>	<b>P</b>

Legend:

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Highly Positive (VHP)
4	3.41 – 4.20	Highly Positive (HP)
3	2.61 – 3.40	Positive (P)
2	1.81 – 2.60	Moderately Positive (MP)
1	1.00 – 1.80	Slightly Positive (SP)

It can be seen from the data on Table 4 that the Grade 10 learners show “Positive Attitude” on environmental concerns along terrestrial ecosystem with an average weighted mean of 2.77. Specifically, the respondents agree positively on all the indicators of terrestrial ecosystem except on the “Illegal logging must be prohibited because this practice contributes to the flash floods” with 2.49 or moderately positive. This result is similar to the findings of Aminrad (2013) that students show lukewarm attitude towards environmental concerns and that the lukewarm attitude of the students were developed through the motivation of the families of the respondents, teachers, media, private reading and school curriculum regarding the environment.

**Table 6. Summary of Level of Attitude of the Grade 10 Learners Toward Environmental Concerns**

Environmental Concerns	WM	DE
Terrestrial Ecosystem	2.77	P
Aquatic Ecosystem	2.65	P
Atmospheric Ecosystem	2.91	P
<b>AWM</b>	<b>2.78</b>	<b>P</b>

Legend:

Point Values	Statistical Limit Range	Descriptive Equivalent (DE)
5	4.21 – 5.00	Very Highly Positive (VHP)
4	3.41 – 4.20	Highly Positive (HP)
3	2.61 – 3.40	Positive (P)
2	1.81 – 2.60	Moderately Positive (MP)
1	1.00 – 1.80	Slightly Positive (SP)

It can be seen in Table 6 that the level of attitude of the Grade 10 learners towards environmental concerns obtained an average weighted mean of 2.78 or positive. Terrestrial ecosystem received a weighted mean of 2.77, Aquatic ecosystem obtained 2.65, while atmospheric ecosystem had a mean of 2.91.

## Conclusions

Based on this study, the following conclusions were made:

- Generally, Grade 10 learners have satisfactory performance in Science, parents are high school undergraduate, self-employed, with minimum family monthly income, have mass media like television, radio, and cellular phone at home, and participated in different environmental activities.
- The Grade 10 learners are moderately aware towards environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems.
- The Grade 10 learners show positive attitude towards environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems.
- The Grade 10 learners moderately participate in environmental concerns along terrestrial ecosystem, aquatic ecosystem, and atmospheric ecosystems.
- An action plan was proposed to enhance the level of awareness, attitude and participation of Grade 10 learners relative to the environmental concerns



## Recommendations

On the basis of the findings of this study and the conclusions drawn, the following are hereby recommended:

1. Environmental education should be intensified in the K to 12 curriculum and should be integrated in all subjects areas especially in Science to promote their higher awareness, develop a highly positive attitude and encouraged high level of participation of students towards environmental concerns especially along terrestrial, aquatic and aerial.
2. Considering the result of the study, the educational system with its present curriculum, should provide students with varied interesting school activities that are suited to them to attain a higher level of awareness, develop a highly positive attitude towards environmental concerns, and enhance their level of participation especially along terrestrial, aquatic and aerial ecosystem.
3. The school should provide access over facilities and information relating to environmental concerns to achieve a higher level of awareness, highly positive attitude, and high level of participation of students towards environmental concerns.
4. The school and the community led by the school officials and community leaders should engage in pro-environmental activities such as environmental campaigns, fun run, beautification program, Earth Day celebration and others to encourage students to ensure high participation level especially along terrestrial, aquatic, and atmospheric ecosystem.
5. Further studies about environmental awareness, attitude and participation must be carried out by future researchers using other variables and wider sample area.

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