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Environmental awareness of tertiary students in Nueva Ecija, Philippines: Basis for an action plan on pollution prevention and climate change mitigation

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Abstract

In an institutional context, universities are areas also considered as mini-cities because they constitute several direct and indirect environmental impacts because of their high population density. It is one of their prime mandates to be actively instrumental in the sustainability movement, and must transcend environmental issues, including improper waste management and pollution. The environmental issues and challenges, as well as sustainable environmental practices on pollution prevention and climate change mitigation of the Nueva Ecija University of Science and Technology were assessed. These data were collected through self-structured, yet validated and reliability-tested survey instruments. These data served as a basis in the development of an action plan on pollution prevention and climate change adaptation of the University. Based on the results of the study, it can be concluded that student-respondents have excellent familiarity on the concepts of climate change and pollution, while satisfactory familiarity on solid waste. The proposed action plan on pollution prevention and climate change mitigation, with emphasis on sustainable resource utilization, solid waste management, energy conservation, environmental presentation, zero waste and circular economy, biodiversity conservation, and socio-civic action, is hereby recommended to be adapted by the University to deepen the understanding, and commitment, and to promote behavior change among its constituents towards a more safe, sound and sustainable University.

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Introduction

In an institutional context, universities are areas also considered as mini-cities because they constitute several direct and indirect environmental impacts because of their high population density (Alshuwaikhat and Abubakar, 2007). Bulk generation of wastes can be seen among the classrooms, hallways, overflowing trash cans, and canteen. This pressing concern of solid waste management is causing negative impact to the immediate surroundings of these academic institutions in particular, and the environment in general. In the 2020 Waste Analysis and Characterization Study (WACS) conducted in Nueva Ecija University of Science and Technology- Gen. Tinio St. Campus, it was found out that most waste generated by the University are organic wastes, including kitchen and food wastes, accounting for almost 30%, while paper accounted for almost 20%. According to the report released by the Global Methane Hub, 1/3 of all foods produced go to waste. When these food wastes decompose, it generates methane, which is a greenhouse gas that is 86 times more powerful than carbon dioxide. With this, food waste systems account for almost 58% of global methane emissions. This scenario exacerbates the negative impacts of climate change both in the global and local contexts.

With the enactment of various environmental laws in the country, including Republic Act 9003 (*Ecological Solid Waste Management Act*), Republic Act 8749 (*Philippine Clean Air Act*), Republic Act 9275 (*Philippine Clean Water Act*), Republic Act 6969 (Nuclear and Hazardous Waste Control Act), and Republic Act 9512 (National Environmental Awareness and Education Act), these serve as the blueprint and guide of the of the country in achieving a safe and sound environment. In addition to these environmental laws, environmental policies are being drafted by educational institutions to be implemented within their campuses. Higher Education Institutions (HEIs) play a vital role in establishing sustainable development and clean environment through instruction, research, extension and training programs. It is one of their prime mandates to be actively instrumental in the sustainability movement, and must transcend environmental issues, including improper waste management and pollution. This emphasizes the importance of environmental education which focuses on knowledge, attitude, and abilities related to the environment. According to Alshuwaikhat and Abubakar (2007), Universities are areas also considered as mini-cities because they constitute several direct and indirect environmental impacts because of their high population density. In fact, university students, teachers and staff in several city regions around the globe make up around 10% of the population (Ransom, nd). This made him also mention that Universities are physical sites for educating the workforce of tomorrow and are partners in mobilization of all resources to deliver long term goals. Higher Education Institutions (HEIs) play a vital role in establishing sustainable development and clean environment through instruction, research, extension and training programs. Furthermore, the study is also anchored on the provisions of Republic Act 9512, or the National Environmental Awareness and Education Act of 2008. This law mandates that educational institutions, in coordination with relevant government agencies, shall integrate environmental education in their academic curricula, and must initiate environmental programs to increase and deepen the environmental literacy of the students.

This study was conducted to describe the knowledge of the students, including their environmental issues and challenges faced inside the University, and describe their sustainable pollution prevention and climate change mitigation practices. The final output of the needs-based assessment is an action plan, which might be an input for the development of a comprehensive pollution control and climate change mitigation manual of the University.

Material and methods

Research design

The descriptive method of research was employed in this study as this method examines variables in naturally occurring situations by describing and interpreting the state in which these variables are found (Calderon and Gonzales, 2004).

This method is analogous to a fact- finding body wherein the adequate and accurate interpretation of data is at stake. Descriptive research answered the needs of the study since the study described the environmental issues and challenges faced by Nueva Ecija University of Science and Technology and the status environmental and sustainable practices employed by the University in terms of pollution prevention, and climate change mitigation.

Research locale

The study was conducted in Nueva Ecija University of Science and Technology Sumacab and Gen. Tinio Campuses, Cabanatuan City, Province of Nueva Ecija.

The Nueva Ecija University of Science and Technology (NEUST) started in the year 1908 as Wright Institute, and later converted into Nueva Ecija Trade School in year 1929, Central Luzon School of Arts and Trades (1953), Central Luzon Polytechnic College (1964), and now as NEUST, a specialized University, by virtue of Republic Act 8612.

The University operates in six (6) campuses, and various academic off-campuses, spread in the Province of Nueva Ecija (NEUST, 2018). NEUST Sumacab and Gen. Tinio St. Campuses are both located in Cabanatuan City, province of Nueva Ecija, Philippines, one of the chartered cities in the country today. This city is an inseparable part of the Rice Granary of the Philippines, and has contributed a lot in the social, economic, physical, political and cultural aspects. Today, Cabanatuan City is a metropolis city with more than two hundred thousand inhabitants (Cabanatuan City, 2020).

Sample and sampling procedure

Voluntary sampling of non-random sampling techniques was employed in the study. The samples consisted of the students from various programs of the University both distributed randomly in Gen. Tinio St. Campus and Sumacab Campus.

Research instrument

A self-developed research instrument was used in this study, consisting of four (4) parts. Part I of the instrument gathered demographic data from the respondents. Part II described the level of awareness of the students on environmental concepts such as on climate change, solid waste management and pollution control and prevention. The third part was about the environmental issues and challenges faced by the students inside the premises of the University, while the last part (Part IV) gathered data on the sustainable practices employed by students on climate action, solid waste management, and pollution control and prevention. The research instrument underwent validity and reliability test, which both resulted to a highly valid and reliable, and fit to use in the study.

Four point scales were also used to indicate the level of awareness on environmental concepts, degree of agreement on the environmental issues and challenges faced by students inside the University, and the frequency of employment of sustainable environmental practices. The following scales are presented on the table that follows:

Procedure of the study

This research complied with the following procedure of gathering the data: (i) literature and studies pertinent to the study were reviewed; (ii) the research instrument was developed to fit the needs of the study; (iii) validity and reliability of the research instruments were also established to ensure ethical standards of research; (iv) permission from the Dean/Vice President for Academic Affairs was sought; (v) participation of the respondents was solicited through an online survey form, where participating respondents were asked to answer the research instrument of the study; (vi) the data gathered was subjected to statistical treatment in order to extract meaning from the information gathered; (vii) conclusions were drawn and recommendations were made based on the results of the study; and (viii) finally, an action plan was developed which might serve as an input in the development of a Comprehensive Pollution Control and Climate Change Mitigation Manual of the University.

Data analysis

Descriptive statistics were used in the analysis of the data gathered through frequency distribution, percentile, ranking, and weighted mean. The level of familiarity/awareness of the respondents on environmental concepts was determined using the scale presented in the matrix that follows:

Scale	Verbal Description	Verbal Interpretation
3.26 – 4.00	Very Familiar	Excellent Familiarity
2.51 – 3.25	Familiar	Satisfactory Familiarity
1.76 – 2.50	Somewhat Familiar	Poor Familiarity
1.00 – 1.75	Not at all Familiar	No Familiarity

Meanwhile, the degree of agreement of the student-respondent on environmental issues and challenges faced inside the University was determined using the scale presented in the following matrix.

Scale	Verbal Description	Verbal Interpretation
3.26 – 4.00	Strongly Agree	High Level of Agreement
2.51 – 3.25	Agree	Moderate Level of Agreement
1.76 – 2.50	Disagree	Low Level of Agreement
1.00 – 1.75	Strongly Disagree	No Agreement

Lastly, the frequency of employment of sustainable environmental practices of students was determined using the scale presented in the following matrix.

Scale	Verbal Description	Verbal Interpretation
3.26 – 4.00	Very Frequently	Always Employed
2.51 – 3.25	Frequently	Frequently Employed
1.76 – 2.50	Rarely	Sometimes Employed
1.00 – 1.75	Never	Never Employed

Result and discussion

Level of awareness of students on environmental concepts

Awareness on climate change

Table 1 shows the level of awareness of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus on environmental concepts, specifically, on climate change.

As can be seen from the table, a grand mean of 3.30, with a verbal interpretation of "Excellent Familiarity", was obtained. This indicates that student-respondents have a high level of awareness and familiarity on climate change concepts. This result is similar to the findings of Magulod (2018) in which he has found out that students of Cagayan State University have a high level of awareness and Barreda (2018) where she has noted that students of Partido State University have much awareness on climate change issues.

Table 1. Level of awareness on climate change.

Climate Change Concepts and Issues	WM	VI
1. Climate change is the long-term change on climate	3.30	EF
2. Climate change causes changes in weather over days and months	3.36	EF
3. Climate change results to inconsistent weather patterns	3.32	EF
4. Climate change causes melting of snow caps and glaciers	3.11	SF
5. Climate change causes excessive chances of rain and flooding	3.40	EF
6. Climate change results to sea level rise	3.32	EF
7. Climate change causes increased number of typhoon entering the Philippine Area of Responsibility	3.27	EF
8. Climate change causes increased temperature and chances of drought	3.39	EF
9. Climate change impacts our physical and mental health negatively.	3.12	SF
10. Your simple action could contribute to preventing and mitigating the impact of climate change	3.40	EF
GRAND MEAN	3.30	EF

Meanwhile, the students of Batanes State College, even though they are always hit by typhoons, have a moderate level of awareness on climate change issues. This is explained by the fact that the residents of Batanes are mostly used to this, thus they perceived the normality of such meteorological events (Castillo & Nozaleda, 2022). Meanwhile, among the 10 indicators, indicator 5 (*Climate change causes excessive chances of rain and flooding*), and indicator 10 (*Your simple action could contribute to preventing and mitigating the impact of climate change*) obtained the highest weighted mean of 3.40, with a verbal interpretation of "Excellent Familiarity". This is further substantiated by the results of the study of Lopez & Malay (2019), where they revealed that respondents of their study are more aware that climate change causes increased chances of flooding brought about by typhoons and strong rains.

Awareness on solid waste

Table 2 presents the level of awareness of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus on solid waste.

Table 2. Level of awareness on solid waste.

Solid Waste Concepts and Issues	WM	VI
1. Solid wastes are any discarded materials from institutional, commercial or domestic sources.	3.17	SF
2. Improper disposal of waste may result to environmental problems such as clogging of drainage, pollution and contamination	3.55	EF
3. Improper disposal of waste may result in health problems such as cough, dizziness, and cases of dengue, and malaria.	3.44	EF
4. Improper management of waste exacerbates climate change.	3.32	EF
5. The Philippines has Republic Act 9003 or the Ecological Solid Waste Management Act of 2000.	2.72	SF
6. Republic Act 9003 mandates the proper segregation of waste into compostable, recyclable, residual and special wastes.	2.81	SF
7. Republic Act 9003 prohibits the littering, throwing and dumping of wastes in public areas.	2.75	SF
8. Republic Act 9003 prohibits the burning of waste in open and public areas.	2.79	SF
9. An ecological solid waste management system is the solution for the solid waste problem.	3.06	SF
10. The participation of everyone is essential in solid waste management.	3.40	EF
GRAND MEAN	3.10	SF

As can be seen from the table, a grand mean of 3.20, with a verbal interpretation of "Satisfactory Familiarity" was obtained. This result implies that student-respondents have a satisfactory familiarity indicating a moderate level of awareness on the concepts and issues of solid waste. This result is similar to the findings of Molina and Catan (2021) in which they have found out that high school students in Zamboanga State College have a moderate level of awareness on the concepts of solid waste. Meanwhile, the table also shows various indicators of solid waste concepts. As can be seen from the above, indicator 2 (Improper disposal of waste may result in environmental problems such as clogging of drainage, pollution and contamination) obtained the highest weighted mean of 3.44 verbally interpreted as "Excellent Familiarity". This indicates that student-respondents of Nueva Ecija University of Science and Technology have a high level of awareness on the negative repercussions of improper waste management on the environment. However, it can also be gleaned that indicator 5 (The Philippine has Republic Act 9003 or the Ecological Solid Waste Management Act of 2000), indicator 7 (Republic Act 9003 prohibits the littering, throwing and dumping of wastes in public areas), indicator 8 (Republic Act 9003 prohibits the burning of waste in open and public areas), obtained the lowest weighted mean of 2.72, 2.75, and 2.79, respectively, all verbally interpreted as "Satisfactory Familiarity". These findings imply that student-respondents have a lower awareness of the provisions of Republic Act 9003, or the Ecological Solid Waste Management Act of 2000. This result is substantiated by the study of Barloa, Lapie and Dela Cruz (2016) where they have revealed that students of Laguna State Polytechnic University have satisfactory knowledge and attitude, however, have lesser satisfactory practice on waste management.

Awareness on pollution

Table 3 shows the level of awareness of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus on pollution concepts and issues.

Table 3. Level of awareness on pollution.

Pollution Concepts and Issues	WM	VI
1. Pollution is the contamination of the components of the environment (air, water, soil)	3.49	EF
2. Pollution negatively affects our environment as it disrupts the natural function of the ecosystem.	3.42	EF
3. Pollution affects the quality of life by causing health issues such as respiratory diseases (asthma, lung cancer, etc.)	3.50	EF
4. The Philippines has Republic Act 9275 or the Philippine Clean Water Act	2.81	SF
5. The Philippines has Republic Act 8749 or the Philippine Clean Air Act	2.80	SF
6. Air Pollution comes from various sources such as burning of fossil fuels, emission of smokes, and volcanic eruptions.	3.41	EF
7. Water pollution is the effect of discharging foreign materials into the water bodies.	3.35	EF
8. Soil pollution is the result of excessive use of fertilizers and improper dumping of waste.	3.25	SF
9. Pollution enhances the global climate problem.	3.41	EF
GRAND MEAN	3.27	EF

As can be seen from the table, a grand mean of 3.27, verbally interpreted as "Excellent Familiarity" was obtained. This implies that student-respondents have a high level of familiarity on pollution concepts and issues. Meanwhile, the lowest weighted means were obtained by indicator 5 *(The Philippines has Republic*

Act 8749 or the Philippine Clean Air Act), and indicator 4 (*The Philippines has Republic Act 9275 or the Philippine Clean Water Act)*, obtaining a weighted mean of 2.80 and 2.82, respectively. This finding revealed that student-respondents are slightly familiar on pollution laws such as RA 8749 and RA 9275. This finding is similar with the findings of Alimen, Oberanio & Villanueva (2020) where they have found out that Marine Engineering students from John B. Lacson Foundation Maritime University in Iloilo, Philippines were aware of the Clean Air Act and its influence in the preservation of the environment, as they indicated that this act protects our environment from air pollution. Meanwhile, student-respondents from Camarines Norte State College in Camarines Norte, Philippines, are mostly aware on RA 9003 (Ecological Solid Waste Management Act of 2000), than RA 8749, and RA 9275, thus it is hereby recommended to intervene with the limited knowledge on these environmental laws to enhance their awareness (Ezaki & Vargas, 2021).

Environmental issues and challenges faced inside the University

Issues and challenges on climate change

Table 4 shows the degree of agreement of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus about the issues and challenges brought by the impact of climate change.

Table 4. Level of agreement of experienced effect of climate change.

Issues and Challenges on Climate Change	WM	VI
1. Inconsistent weather pattern	3.01	MLA
2. Rising temperature	3.14	MLA
3. Increased number of typhoon	4.03	HLA
4. Excessive rain and flooding	2.99	MLA
5. Excessive drying and wilting of vegetation	2.61	MLA
6. Excessive sweating	2.91	MLA
7. Nausea and vomiting	2.58	MLA
8. Skin rashes	2.78	MLA
GRAND MEAN	3.01	MLA

As can be seen from the table, a grand mean of 3.01, with a verbal interpretation of "Moderate Level of Agreement", was obtained. This indicates that student-respondents have a moderate level of experienced effects of climate change. Meanwhile, indicator only 3 (i*ncreased number of typhoons*) obtained the highest weighted mean of 4.03, verbally interpreted as a "High Level of Agreement", emphasizing that this is the most common effects of climate change experienced by the student-respondents. This is due to the fact that the Philippines is a country ranked as one of the most vulnerable to the impact of climate change. According to the Climate Risk Profile of the Philippines (2017), the country is vulnerable to the negative impacts of climate change such as increased frequency of stronger and devastating typhoons, increasing occurrences of flooding, and sea level rise. In addition, the National Climate Action Plan 2011 - 2028 indicates that the country will experience continuous weather changes, particularly in the amount of rainfall, that will have negative economic, environmental and social impacts of climate change. Furthermore, Castillo and Nozaleda (2018) supports the findings of the study as they have found that their students were aware that climate change can cause increased frequency of natural calamities.

Issues and challenges on solid waste

Table 5 presents the degree of agreement of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus about the issues and challenges brought by the impact of pollution.

Table 5. Level of agreement of experienced effect of solid waste.

Issues and Challenges on Solid Waste	WM	VI
1. Waste thrown improperly	2.97	MLA
2. Limited number of waste bins	2.80	MLA
3. Unsegregated waste	2.92	MLA
4. Overflowing trash bins	2.94	MLA
5. Foul odor of waste	2.82	MLA
6. Limited number of waste collector	2.83	MLA
7. Flies and pests infestation	2.89	MLA
8. Diarrhea and typhoid fever	2.79	MLA
GRAND MEAN	2.87	MLA

Table 5 presents the level of agreement on the experienced effects of student-respondents on improper solid waste management. As can be gleaned from the table, a grand mean of 2.87, verbally interpreted as with "Moderate Level of Agreement", was obtained.

This indicates that student-respondents have a moderate level of experienced effects improper solid waste management. It can also be observed that all the indicators used obtained a moderate level of agreement, emphasizing that the University has enough trash bins and waste workers distributed in various areas of the University, thus there is a limited report on overflowing trash bins. It can also imply that the policies and program of the University in terms of solid waste management is effective, combined with facilities that support proper waste management, leading to lower cases of pest infestation and typhoid/diarrhea fever among its students and employees (Office of the University President Memorandum Order No. 32, series of 2020).

Issues and challenges on pollution

Table 6 presents the degree of agreement of student-respondents from NEUST Sumacab and Gen. Tinio St. Campus about the issues and challenges brought by the impact of improper solid waste management.

Table 6. Level of agreement of experienced effect of pollution.

Issues and Challenges on Pollution	WM	VI
1. Foggy and dusty environment	2.87	MLA
2. Poor air quality	2.98	MLA
3. Reduced sunlight due to suspended particulate matter	2.78	MLA
4. Turbid and muddy water	2.76	MLA
5. No wastewater treatment facility	2.88	MLA
6. Water from faucet is not potable and safe to drink	2.91	MLA
7. Presence of open burning	2.81	MLA
8. Uncontrolled noises from vehicles and construction works.	2.96	MLA
GRAND MEAN	2.87	MLA

Table 6 presents the level of agreement on the experienced effects of student-respondents on pollution. As can be gleaned from the table, a grand mean of 2.87, verbally interpreted as with "Moderate Level of Agreement", was obtained. This indicates that student-respondents have a moderate level of experienced effects on pollution. It can also be observed that all the indicators used obtained a moderate level of agreement, emphasizing that the University premises are not polluted, thus having better environmental quality. This result shows that the University is committed to the achievement of United Nations' Sustainable Development Goals (UN-SDSs), and is serious in its contribution towards the conservation and protection of the environment.

Sustainable Environmental Practices Employed by the Students

Table 7 shows the sustainable environmental practice employed by students in terms of climate action, solid waste management and pollution prevention.

Table 7. Level of agreement of experienced effect of pollution.

Sustainable Environmental Practices Employed by Students	WM	VI
1. Turning off the lights and fan when not in use	2.50	SE
2. Using carpooling and public transportation	2.62	FE
3. Walking instead of riding a tricycle/trike.	2.54	FE
4. Avoiding the use of pressurized products	2.48	SE
5. Reading and sharing articles/ books /news on climate change, solid waste management and environmental pollution.	2.46	SE
6. Joining environmental initiatives and advocacy such as IEC campaigns, clean-up drives and tree planting, etc.	2.52	FE
7. Participating in seminars and training on environmental education, climate action and the like.	2.48	SE
8. Being a more conscious consumer by purchasing environmentally-friendly products and clothing made from low-impact fibers.	2.52	FE
9. Calculating my carbon footprint to have my baseline emissions.	2.49	SE
10. Tackling environmental issues in classes to be more informed	2.56	FE
11. Disposing my waste properly	2.57	FE
12. Practicing segregation-at-source.	2.58	FE
13. Avoiding/refusing Single-Use Plastic	2.55	FE
14. Practicing Clean As You Go (CLAYGO)	2.61	FE
15. Composting organic/biodegradable waste	2.55	FE
16. Recycling waste into new products	2.47	SE
17. Bringing lunch boxes, tumbler, and metal-stainless spoon, and other reusable products.	2.54	FE
18. Educating fellow students on proper waste management	2.54	FE
19. Attending seminar-training on waste management	2.52	FE
20. Promoting class policies on cleanliness and orderliness	2.56	FE
GRAND MEAN	2.53	FE

Table 7 presents the sustainable environmental practices employed by NEUST Sumacab Campus and

Gen. Tinio Campus students. As can be seen from the above, a grand mean of 2.53, with verbal interpretation of "Frequently Employed" was obtained. This indicates that student-respondents are frequently employing these sustainable environmental practices to promote and advocate climate action, solid waste management and pollution prevention. Meanwhile, in a closer inspection of the indicators in Tables are indicators obtained a verbal interpretation of "Frequently Employed", while the remaining six (6) indicators obtained a verbal interpretation of "Sometimes Employed". Though these practices did not obtain the highest form of employment which is always employed, this just shows that NEUST students are conscious of various environmental issues, thus, employed practices that could help lessen the negative impacts of these environmental issues. NEUST, as a Higher Education Institution, plays a vital role in establishing sustainable development and clean environment through instruction, research, extension and training programs. It is one of their prime mandates to be actively instrumental in the sustainability movement, and must transcend environmental issues, including improper waste management and pollution. This emphasizes the importance of environmental education which focuses on knowledge, attitude, and abilities related to the environment.

Proposed Action Plan on Pollution Prevention and Climate Change Mitigation

Based on the results of the study, an action plan on pollution prevention and climate change mitigation was developed. This action plan lists the project/program/activities that will be undertaken in order to achieve the desired goal of the study, and as an input to the development of University Pollution Prevention and Climate Change Mitigation Manual. The action plan also lists down the strategies to be undertaken, its expected output, responsible person/office/unit/department of the University, and the time frame required for the undertaking.

Table 8 shows the proposed action plan on pollution prevention and climate change mitigation which outlines the specific activities based on the results of the study. The action plan also anchors on the national and international environmental celebration as a way of institutionalizing the University's active participation in the achievement of sustainable development goals.

Table 8. Proposed action plan on pollution prevention and climate change mitigation.

1. Strengthening walk the talk program	
Activities Involved	University-wide clean-up and green-up drive
Objectives	• Encourage wider participation and active volunteerism of students in cleaning up and greening up their immediate surroundings and environment (parks, gardens, classrooms, hallways, student centers, etc.) • Practice the concept of Clean As You Go (CLAYGO)
Office/Unit Involved	• University Student Government and Local Councils • Office of Student Affairs and Services • Dean's Office • Pollution Control Office • General Services and Building Maintenance Department
Time Frame	• August (start of Academic Year)
Expected Output	• Encouraged active and wide participation of University stakeholders towards a clean and green University
2. Massive Information, Education and Communication (IEC) Campaign	
Activiti/ies Involved	University-wide seminar-training on environmental education
Objectives	• Foster deeper understanding on environmental concepts • Provide volunteerism and encourage wider participation among University stakeholders (administrator, faculty, students, clients, etc) • Influence the students to proactively pursue an environment-friendly University

Office/Unit Involved	• University Student Government and Local Councils • Office of Student Affairs and Services • Pollution Control Office • Center for Environmental Research
Time Frame	• Second Week August (start of Academic Year)
Expected Output	• Fostered deeper understanding and encouraged active and wide participation of University stakeholders towards the achievement of environment-friendly University.

3. Lecture-Film Series on Ozone Layer Protection and Zero Emission

Activiti/ies Involved	• Interactive lecture and film-viewing activity on climate action and preservation of ozone layer in the observance of International Day for the Preservation of the Ozone Layer and Zero Emissions Day
Objectives	• Provide understanding on Montreal Protocol, Vienna Convention for the Preservation of the Ozone Layer • Provide scientific knowledge on the harms of ozone depleting substances • Offer a preview of what the Planet Earth would look like without emission of fuel fuels.
Office/Unit Involved	• University Student Government and Local Councils • Office of Student Affairs and Services • Pollution Control Office • Center for Environmental Research
Time Frame	• August (start of Academic Year)
Expected Output	• Behavioral change of the community and increasing awareness on the danger of depleted ozone layer and high emission of fossil fuels.

4. University-Wide Clean-up Drive

Activiti/ies Involved	• University-Wide Clean-Up Drive in line with the Celebration of the National Clean-up Month (Proclamation No. 244, and World Clean-up Day)
Objectives	• Provide understanding on Montreal Protocol, Vienna Convention for the Preservation of the Ozone Layer • Provide scientific knowledge on the harms of ozone depleting substances • Offer a preview of what the Planet Earth would look like without emission of fuel fuels.
Office/Unit Involved	• NEUST - Environmental Science Society • Pollution Control Office • Center for Environmental Research
Time Frame	• September
Expected Output	• Mobilized the massive voluntary action to support the institutionalization of the clean-up and greening program of the University and the National Government.

5. Seminar-Training on Energy Efficiency and Climate Action

Activiti/ies Involved	• Seminar-training on energy conservation and sustainable climate action in relation to the Energy Efficiency Day and National and International Youth Day for Climate Action
Objectives	• Outline and appreciate the University's Energy Efficiency Policies, and the country's climate change adaptation and mitigation agenda. • Foster leadership and encourage wider and active participation of youth in socio-civic and environmental initiatives. • Strengthen the potential of youth as partners in nation-building.
Office/Unit Involved	• NEUST - Environmental Science Society • University Student Government • Pollution Control Office • Center for Environmental Research
Time Frame	• October- November
Expected Output	• Mobilized the massive voluntary action to support the institutionalization of the clean-up and greening program of the University and the National Government.

6. National Environmental Awareness Month

Activiti/ies Involved	• Interactive lecture and training on environmental awareness in line with the Philippine' National Environmental Awareness Month • Seminar on Environmental Laws (RA 9003, RA 8749, RA 9275, RA 6969) • Slogan-making and poster-making contest • Environmental Quiz Bee • Crafts from Scrap

Objectives	• Disseminate information on current status of Philippine air and water quality, and the country's efforts to combat improper solid waste management. • Promote awareness on the importance and foster a deeper sense of understanding of protecting the environment and the country;s natural resources. • Encourage everyone's participation towards the achievement of sustainable development goals • Strengthen the integration of environmental education on academic curricula.
Office/Unit Involved	• Pollution Control Office • Center for Environmental Research • University Student Government • NEUST - Environmental Science Society
Time Frame	• November
Expected Output	• Promote awareness on the importance of a safe, clean, green and sustainable environment.

7. World Soil Day

Activiti/ies Involved	• Interactive lecture on sustainable management of soil resources in observance of the World Soil Day
Objectives	• Promote awareness on the importance of a healthy soil • Advocate for the sustainable utilization and management of soil resources
Office/Unit Involved	• Pollution Control Office • Center for Environmental Research • College of Agriculture • University Student Government • NEUST - Environmental Science Society
Time Frame	• December
Expected Output	• Promote awareness on the importance of a healthy soil and sustainable utilization and management of solid resources.

8. NEUST: A Zero Waste University

Activiti/ies Involved	• Seminar-training on RA 9003, Waste Analysis and Brand Audit, Organics Management, Waste Recycling and Policy Formulation, in observance of Presidential Proclamation No 760, s. 2014
Objectives	• Increase students' skills and understanding • Increase students' level of participation and commitment • Provide technical skills on waste management systems • Provide technical know-how in crafting policies on solid waste
Office/Unit Involved	• Pollution Control Office • Center for Environmental Research • University Student Government • NEUST - Environmental Science Society
Time Frame	• January
Expected Output	• Capacitate the University stakeholders, specially the studentry towards a sound and efficient solid waste management.

9. Lecture-Film Series on World Wetlands Day

Activiti/ies Involved	• Interactive lecture and film-viewing activity on the world and country's wetlands.
Objectives	• Provide scientific knowledge on the status and conservation efforts for the wetlands • Offer a preview of the important ecological and economic roles of wetlands
Office/Unit Involved	• Center for Environmental Research • Pollution Control Office • University Student Government and Local Councils • Office of Student Affairs and Services
Time Frame	• February
Expected Output	• Behavioral change of the community and increasing awareness on the importance of conserving wetlands.

10. World Meteorological Day

Activiti/ies Involved	• Interactive lecture on weather forecasting and community-based disaster management
Objectives	• Provide scientific knowledge on different hydrometeorological hazards • Provide efficient information and warning system for hydrometeorological hazards • Inform the students to be actively involved in disaster preparedness

Office/Unit Involved	• University Disaster Risk Reduction and Management Office • Pollution Control Office • Center for Environmental Research • University Student Government and Local Councils • Office of Student Affairs and Services
Time Frame	• March
Expected Output	• Be informed on various hydrometeorological hazards, and become prepared and able to act at the right time.
11. Earth Day	
Activiti/ies Involved	• Tree Nurturing Activities
Objectives	• Facilitate the practice of tree nurturing of native plant species in deforested areas in observance of Earth Day • Capacity building on environmental assessment and monitoring (water and soil analysis, biodiversity and social assessment, meteorological and air quality assessment)
Office/Unit Involved	• Department of Environmental Science • Department of Biology • Pollution Control Office • Center for Environmental Research • University Student Government and Local Councils • Office of Student Affairs and Services
Time Frame	• April
Expected Output	• A tree nurturing site that promotes planting of native tree species thus leading to the conservation of deforested areas.
12. Environmental Education and Management Towards Biological Conservation	
Activiti/ies Involved	• Seminar-Training on Biodiversity Conservation, Biodiversity Research
Objectives	• Provide knowledge and instill deeper sense of understanding on the importance of participation of various sectors on environmental protection and biodiversity conservation
Office/Unit Involved	• University Training Department • Pollution Control Office • Center for Environmental Research • Environmental Science Society
Time Frame	• May
Expected Output	• Increased the knowledge and deepened the understanding of the stakeholders and target communities on environmental management and biodiversity conservation.
13. Arbor Day	
Activiti/ies Involved	• Tree monitoring and re-nurturing and activities
Objectives	• Monitor, assess and evaluate the tree nurturing site.
Office/Unit Involved	• Pollution Control Office • Center for Environmental Research • Office of Student Affairs and Services
Time Frame	• June
Expected Output	• Assessment and monitoring report, and re-nurtured native plants.
14. World Environment Day	
Activiti/ies Involved	• Interactive lecture and film-viewing activity
Objectives	• Educate students to be more socially and environmentally-responsible
Office/Unit Involved	• Department of Environmental Science • Center for Environmental Research • Pollution Control Office
Time Frame	• June
Expected Output	• Assessment and monitoring report, and re-nurtured native plants.

Conclusion

Based on the results of the study, it can be concluded that student- respondents have excellent familiarity on the concepts of climate change and pollution, while satisfactory familiarity on solid waste. These indicate that students from Nueva Ecija University of Science and Technology have a high level of awareness on environmental concepts, particularly on

climate change, solid waste and environmental pollution. Meanwhile, the most experienced effects of climate change is the increased number of typhoons entering the Philippine Area of Responsibility, while in terms of solid waste and environmental pollution, all indicators obtained a moderate level of agreement indicating a limited experienced effect. Lastly, a frequently employed interpretation was obtained for sustainable environmental practices employed by students, thus indicating that student-respondents are frequently employing these sustainable environmental practices to promote and advocate climate action, solid waste management and pollution prevention.

Recommendation(s)

The proposed action plan on pollution prevention and climate change mitigation, with emphasis on sustainable resource utilization, solid waste management, energy conservation, environmental presentation, zero waste and circular economy, biodiversity conservation, and socio-civic action, is hereby recommended to be adapted by the University to deepen the understanding, and commitment, and to promote behavior change among its constituents towards a more safe, sound and sustainable University.

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