Impact of Project Helping Our environment by Making useful Ecobricks (H.O.M.E) in Kasiglahan Village National High

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ABSTRACT

The **Project H**elping **O**ur environment by **M**aking useful **E**cobricks **(H.OM.E.)** aimed to improve the cleanliness and orderliness of Kasiglahan Village National High School in solid waste through the use of Ecobricks. An Ecobrick is plastic bottles packed to a set density with used, clean, and dry plastics to achieve a building block that can be used over and over again. Ecobrick is one of the solutions to plastic pollution all over the world. Ecobricks making aims to teach people, not only students, to learn how to refuse the single used plastic and to recycle those that are already used.

The researchers got the idea of making Ecobricks to help segregate single - used plastics that are used in schools and in the community. All Science Teachers asked the students to make one Ecobrick (500 ml plastic bottle and 250 g to 350 g of used, cleaned plastics).

Quantitative method of research was used to gather relevant data which can be used for the purpose of the project. The completed project was utilized in the construction of the school's MRF (Materials Recovery Facility), with 576 pieces of 1.5 L (Coke and Sprite) and 614 pieces of 500 mL (Nature's Spring) Ecobricks bottles, which were used to segregate solid wastes. The result of the project helped the students to be aware of the effects of single - used plastics in the environment and it helped the school to thrive in cleanliness and orderliness of solid waste management. 1,599 pieces of Ecobricks with 686.4 Kg were logged at GoBrik.com.

The project focused in solid wastes particularly in single - used plastics that were found in school and community, and make them as useful as other materials.

KEYWORDS

Ecobricks, Materials Recovery Facilities (MRF), single-use plastic, and solid waste

INTRODUCTION

The or YES (**Y**nares **E**co **S**ystem) To Green Program is a flagship program of Governor Rebecca "Nini" A. Ynares, Governor of Rizal Province, Philippines. This program was launched last 2013 at the Ynares Center, Antipolo City. It aims to address environmental issues of waste management, clogged water tributaries, deforested mountains and watersheds, and declining livelihood opportunities.

The said project has three components namely: GREENING the environment, CLEANING the environment and RECYCLING.

In line with this, the Kasiglahan Village National High School came up with project L.I.N.K (**L**ittering **I**s **N**ot o**K**) under C.I. (Continuous Improvement in Schools) last February of 2015. The aim of the said project was to change students' psyche about waste disposal and

enhance provisions of needed facilities for proper disposal of waste in the school. The project was implemented from 2016 – 2017. The C.I Core Team sought for the help of various departments to come up with different activities (SLOGAN/POSTER Making contest, Dance Contest or Movie Presentation) that will encourage students in proper disposal of their garbage. As a result, in school year 2017 – 2018, there was an implementation of *"Basura Mo, Iuwi Mo"* that was agreed upon by all teachers.

In School Year 2018 – 2019, the Youth for Environment in Schools Organization (YES-O) of Kasiglahan Village National High School came up with another project that was related with waste management/segregation awareness, the Project H.O.M.E or **H**elping **O**ur environment by **M**aking useful **E**cobricks. This project is still being implemented up to this present school year 2023-2024.

An Ecobrick is a plastic bottle packed to a set density with used, clean and dry plastic to achieve a building block that can be used over and over again. It started last 2013 when Russell Maier, a professional Artist from Paris, who visited Philippines and became one of the residents in Northern Mountain Province for 4 years. He observed that the indigenous people from the place burn the plastics and throw them to the rivers where children are swimming and fishing, so he came up with the idea where he inserted the used plastics in the plastic bottle and the rest was history.

Ecobricks is a solution to plastic pollution all over the world. Its main purpose is to lessen the plastic that is being dumped everywhere. It is only by refusing to buy products that are non-biodegradable, non-recyclable and eventually poisonous, that we can shift our living into harmony with the circles of life.

In line with this, Kasiglahan Village National High School, Youth for Environment in Schools Organization (YES-O) adapted the idea of making Ecobricks to help segregate plastics that are used in schools and in the community. The said organization thru Project H.O.M.E (**H**elping **O**ur environment by **M**aking useful **E**cobricks), aims to teach the students/community: (1.) To pack and set a density with cleaned and dried, used plastics to make a reusable building block in a clean and dry plastic bottle; (2.) To enable anyone, anywhere to take personal responsibility for their plastic; and (3.) To make modular furniture, garden space, walls and even full-scale buildings.

Ecobricking is simple, but it's important to start right. This is a long-term habit that we and our community are embarking on.

Statement of the Problem

1. What is the profile of the participants in terms of
   1.1. age,
   1.2. sex, and
   1.3. position?
2. What is the impact of the Project HOME in terms of
   2.1. cleanliness,
   2.2. recycling,
   2.3. creativeness and usefulness, and
   2.4 proper disposal?
2. What is the overall recommendation of the project HOME towards the environment?

METHODOLOGY AND RESEARCH DESIGN

The project employed the quantitative method research design. It assumed that students taught to make Ecobricks would be aware in environmental issues of waste management and clogged water tributaries particularly in single – used plastic which is the main issue around the world right now.

The project was conducted at Kasiglahan Village National High School. It is located in Barangay San Jose, Rodriguez, Rizal, one of the schools in Rodriguez District II, Division of Rizal where most of the students are relocatees of different cities in Manila. Eventually, the project became wider as it was implemented in all Public Junior High Schools in Rodriguez District II.

Below is the list of high quality Ecobricks from GoBrick.com

Table 1
List of High Quality Ecobricks

Plastic Bottle Size	Minimum Ecobrick Weight
500 ml	175 grams
1 000 ml or 1 liter	350 grams
1 500 ml or 1.5 liters	525 grams
1 750 ml or 1.75 liters	613 grams

For the validity of the content, the list of High Quality Ecobricks was validated through www.GoBrik.com.

The conceptual framework of the study adopted the IPO (Input-Process-Output) model which is made up of Input, Process and Output. Figure 1 below shows the paradigm of the study with three diagrams aligned and connected by arrows. The first box was Input which includes the Ecobricks seminar/workshop, and Collection and Segregation of solid waste particularly single – used plastic.

The second box is the Process of proper making and logging of Ecobricks in www.GoBrik.com for validation.

The third box represents the Output, which in this project are the useful materials/modules and structures and the Materials Recovery Facility (MRF) out of Ecobricks, improvement of the solid waste management in schools and community, and the empathy and care for the environment from parents, guardians, teachers and especially for the students.

Figure 1
Conceptual Framework of the Study

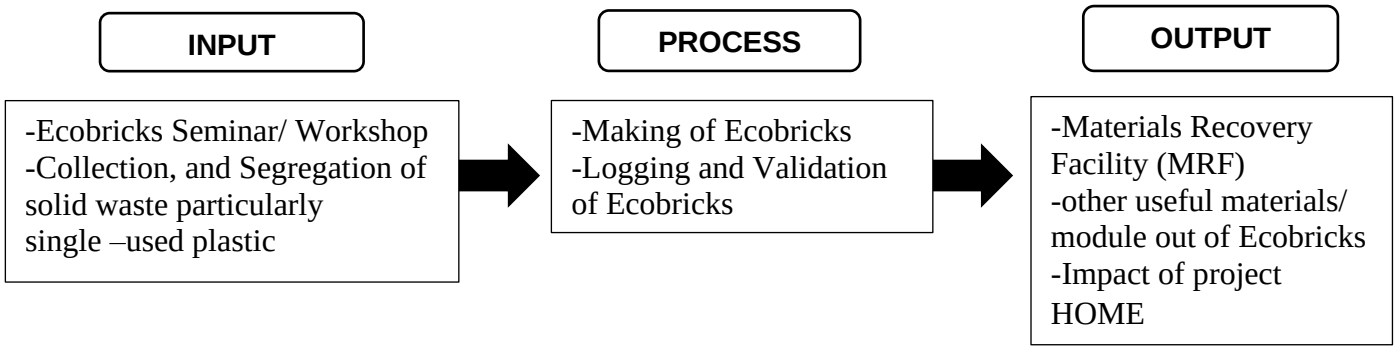
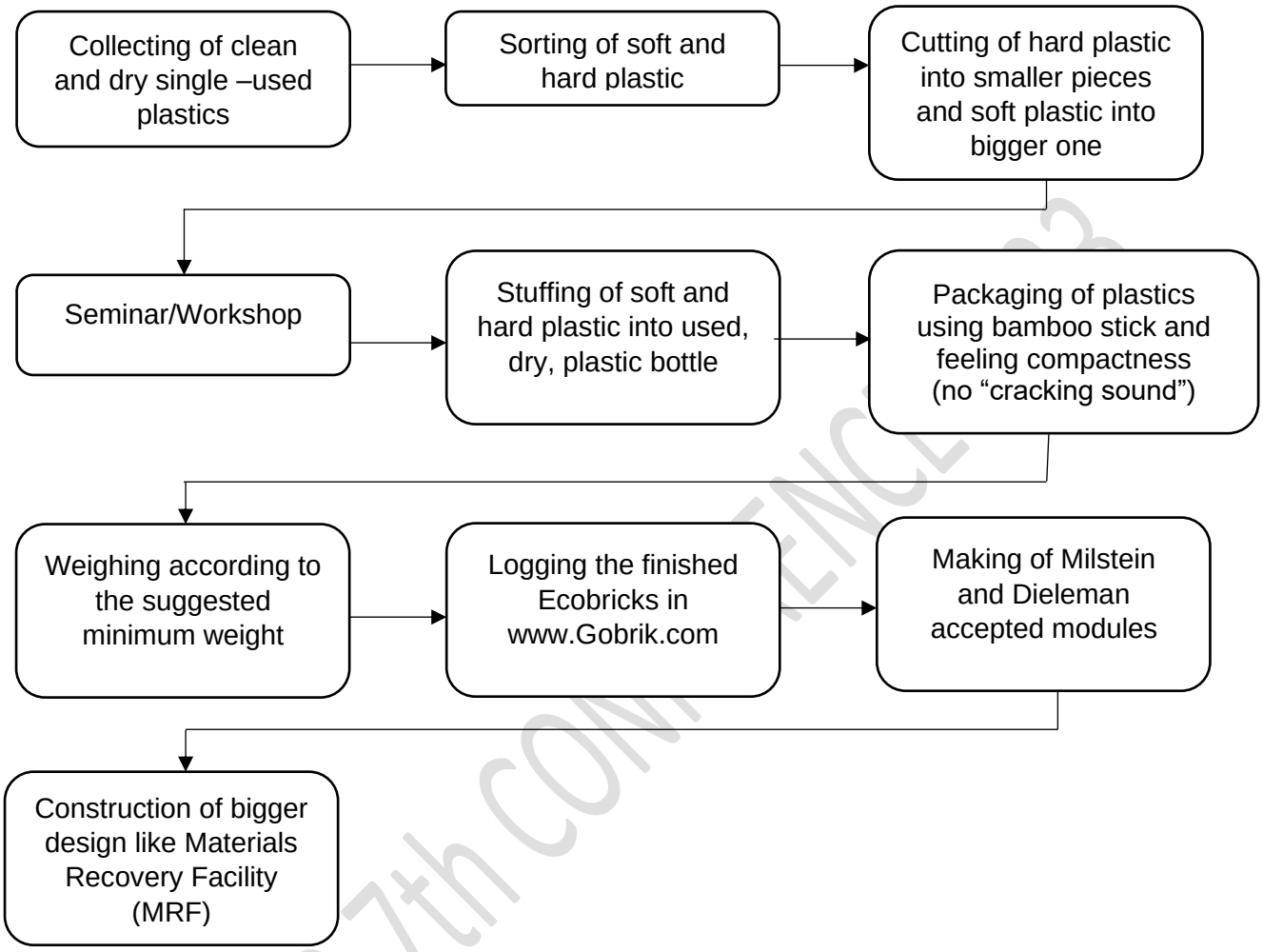


Figure 2
The Flow Chart Showing How the Project was Conceptualize



Presentation, Analysis, and Interpretation of Data

This part includes the presentation, analysis, and interpretation of data that aim to assess the impact of Project HOME (Helping Our environment in Making useful Ecobrick) in Kasiglahan Village National High School.

1. Demographic Profile of the Respondents

The following statistical tools were used to analyze and interpret the data collected:

Frequency Distribution and Percentage. It was used to present and analyze the profile of the respondents.

Weighted Mean. It was used to interpret and analyzed the impact of the Project HOME. The following scale was used:

Scale	Interval	Qualitative Description
4	3.50 – 4.0:	Highly Acceptable/ Recommended
3	3.00 – 3.49:	Acceptable/ Recommended
2	2.00 – 2.99:	Moderately Acceptable/ Recommended
1	1.00- 1.99:	Least Acceptable/ Recommended

T-Test and Analysis of Variance (ANNOVA). They were used to determine if there was a significant difference by the respondent when group according to their profile.

Table 1.
Frequency and Percentage Distribution of the Respondents' Profile

Profile		
Gender	Frequency	Percentage
Male	28	29.78
Female	66	70.21
Age	Frequency	Percentage
10-20	58	61.70
21-30	10	10.63
31-40	12	12.77
41-50	14	14.89
51 and above	0	0
Position		
Students	62	65.96
Teacher	32	34.04
Total	94	100

Table 1. presents the frequency and percentage distribution of the respondents' profile. Based in the table, the distribution between female are (F=66 or 70.21&) are higher than male (M=28 or 29.78%) or 94 of the total number in distribution. Most of the respondents are within the acceptable age of 10-20 (58 or 61.70%) years old. The data revealed that the most of the respondents are students.

Table 2
Comparison of Respondents' Profile in Terms of Gender

	Gender		
Indicator	P-Value	Decision	Remark
Cleanliness	0.55	Accept Ho	Not Significant
Recycling	0.26	Accept Ho	Not Significant
Creativeness	0.26	Accept Ho	Not Significant
Proper Disposal	0.30	Accept Ho	Not Significant

Legend: Significant at P<0.05

Table 2. presents the comparison of respondents' profile of the Impact of the Project HOME in terms of age. With regard to cleanliness, since the computed P-value of 0.55 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of project HOME among the respondents as to cleanliness when gender is considered.

Similarly, with regard to Recycling, since the computed P-value of 0.26 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant

difference in the recycling of the Impact of the Project HOME among the respondents as to recycling when gender is considered.

Likewise, with regard to usefulness, since the computed P-value of 0.480 is greater than 0.05 level of Creativeness and usefulness, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the Impact of the Project HOME among the respondents as to creativeness and usefulness when age is considered.

Finally, with regard to proper disposal, since the computed P-value of 0.261 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of the project HOME among the respondents as to proper disposal when age is considered.

Table 2.1
Comparison of Respondents' Profile in Terms of Age

Indicator	P-Value	Decision	Remark
Cleanliness	0.726	Accept Ho	Not Significant
Recycling	0.727	Accept Ho	Not Significant
Creativeness	0.521	Accept Ho	Not Significant
Proper Disposal	0.523	Accept Ho	Not Significant

Legend: Significant at P<0.05

Table 2.1. presents the comparison of respondents' profile of the Impact of the Project HOME in terms of occupation. With regard to cleanliness, since the computed P-value of 0.726 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of project HOME among the respondents as to cleanliness when occupation is considered.

Similarly, with regard to creativeness and usefulness, since the computed P-value of 0.521 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the creativeness and usefulness of the Impact of the Project HOME among the respondents as to recycling when occupation is considered.

Likewise, with regard to creativeness and usefulness, since the computed P-value of 0.521 is greater than 0.05 level of Creativeness and usefulness, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the Impact of the Project HOME among the respondents as to creativeness and usefulness when occupation is considered.
Finally, with regard to proper disposal, since the computed P-value of 0.523 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of the project HOME among the respondents as to proper disposal when occupation is considered.

Table 2.2.
Comparison of Respondents' Profile in Terms of Position

Indicator	P-Value	Decision	Remark

Cleanliness	0.199	Accept Ho	Not Significant
Recycling	0.200	Accept Ho	Not Significant
Creativeness	0.262	Accept Ho	Not Significant
Proper Disposal	0.199	Accept Ho	Not Significant

Legend: Significant at P<0.05

Table 2. presents the comparison of respondents' profile of the Impact of the Project HOME in terms of position. With regard to cleanliness, since the computed P-value of 0.199 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of project HOME among the respondents as to cleanliness when position is considered.

Similarly, with regard to Recycling, since the computed P-value of 0.200 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the recycling of the Impact of the Project HOME among the respondents as to recycling when position is considered.

Likewise, with regard to usefulness, since the computed P-value of 0.262 is greater than 0.05 level of Creativeness and usefulness, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the Impact of the Project HOME among the respondents as to creativeness and usefulness when position is considered.

Finally, with regard to proper disposal, since the computed P-value of 0.199 is greater than 0.05 level of significance, thus, the null hypothesis is accepted. Therefore, there is no significant difference in the impact of the project HOME among the respondents as to proper disposal when position is considered.

Table 1.1

Summary of Comparison the Respondent's Profile

Profile	P-Value	Decision	Remark
Gender	0.57	Accept Ho	Not significant
Age	0.79	Accept Ho	Not Significant
Position	0.08	Accept Ho	Not Significant

Legend: Significant at P<0.05

Table 3

Summary of the Impact of the Project HOME in terms of Cleanliness, Recycling, Creativeness and Proper Disposal as Assessed by the Respondents

Indicator	Average Weighted Mean	Qualitative Description
Cleanliness	3.51	Highly Acceptable
Recycling	3.53	Highly Accepted
Creativeness	3.47	Acceptable
Proper Disposal	3.65	Highly Acceptable
Over all Recommendation	**3.54**	**Highly Acceptable**

Legend: 1.00-1.49 Least Acceptable (LA), 1.50-2.49 Moderately Acceptable (MA), 2.50-3.49 Acceptable (A), 3.50-4.00 Highly Acceptable (HA)

Table 2. presents the summary of the Impact of the Project H.O.M.E. in terms of cleanliness, recycling, creativeness and proper disposal as assessed by respondents. The table reveals that all the indicators as to cleanliness (AWM= 3.51), recycling (AWM= 3.43), creativeness (AWM= 3.37), Proper disposal (AWM= 3.65), are rated as "highly acceptable. Furthermore, a grand weighted mean of 3.54 was obtained which strengthen the claim that the impact of the Project HOME is "Highly acceptable" by the respondents.

Thus, the results imply that the Impact of the Project HOME may be accepted and sustain in the community.

Table 4
The Top 10 Countries on GoBrik by Authenticated Plastic

Country Name	Ecobrickers	Cities	Plastic
England	21,787	1830	5046kg
Philippines	6,764	314	3461kg
Indonesia	3,264	233	1018kg
South Africa	1,337	314	3461kg
Scotland	1,559	220	231kg
Wales	1,233	190	155kg
Unites States	916	332	44kg
India	148	41	30kg
Costa Rica	25	9	10kg
Australia	247	29	9kg

Table 4.1
The Top 10 Cities on GoBrik by Authenticated Plastic

City	Country	Ecobricks	Briks	Plastic
Rodriguez	Philippines	84	2817	1,027.7.kg
Vallehermoso	Philippines	1	1960	397.0kg
Kota Tanjungpinang	Indonesia	123	859	307.0kg
Cadiz	Philippines	2	463	260.3 kg
Dumagueta City	Philippines	63	1520	161.7kg
Busuanga	Philippines	3	288	154.8kg
Stroud	England	92	508	145.1kg
East London	South Africa	83	660	1373kg

Manila	Philippines	1379	1208	133.0kg
Samarang	Indonesia	535	727	107.3kg

Table 4.2
The Top 10 Communities on GoBrik by Authenticated Plastic

Community	Location	Plastic
Kasiglahan Village National High School	Rodriguez Rizal Philippines	686.4kg
Vallehermoso National High School	Vallehermoso, Negros Oriental Philippines	397.0kg
Land Bank of the Philippines	Manila, Metro Manila Philippines	373.2 kg
Bank Sampah Tanjungpinang Kepri	Kota Tanjunpinang Kepuluan, Indonesia	340.7kg
Montalban Heights National High School	Rodriguez, Rizal, Philippines	335.2kg
New Forest Aquaponics	Hampshire, England	299.2kg
Club Paradise Palawan	Palawan, Philippines	277.3kg
City ENRO-Cadiz	Cadiz City, Negros Occidental, Phil	260.3kg
Cittadini EcoGuardians	Dumagete City, Negros Oriental, Phil	161.3kg
Earth Community	City of Manila , Philippines	149.9kg

Table 4.3
The Top 10 Ecobrickers on GoBrik

Ecobricker	Community	Location	Plastic
Lizel Labo	Kasiglahan Village NHS	Rodriguez Rizal Philippines	490.3kg
Maricar Limpot	Vallehermoso NHS	Vallehermoso, Negros, Philippines	325.3kg
Elmerlyn Dionisio	Montalban Heights NHS	Rodriguez, Rizal Philippines	325.3kg
Camille Bayot	Club Paradise Palawan	Busuanga, Palawan, Philippines	2773.kg
Rian Trinidad	City ENRO- Cadiz	Cadiz, Western Visayas, Philippines	260.3kg
Mary Jane Bayaton	Kasiglahan Village NHS	Rodriguez, Rizal Philippines	146.7kg
Nolan Delos Santos	DSBrick	Boracay Island, Philippines	93.7kg
Lucie Mann	New Forest Aquaponics	Hythe, Hamsphire, England	93.5kg
Hindra Atmaja Kom	Bank Sampah, Kepri	Kota, Riau, Indonesia	86.9kg
Jericho Von Miranda	Land Bank of The Phil	Metro Manila Philippines	707.kg

RESULTS AND DISCUSSION

The data were presented with the aid of this appropriate statistics tool and finding were given implications to strengthen the concepts.

Figure 3, Table 4, Table 4.1 - 4.3 present the top 10 countries, cities and community who logged and were authenticated by the www.Gobrik.com by Ecobrickers.

As revealed by the Figure 3 on the result of the logging of different countries, Philippines ranked 2 for top 10 countries, Rodriguez ranked 1 for top 10 cities, Kasiglahan Village National High School ranked 1 for top 10 communities and Lizel Labo ranked 1, while Mary Jane Bayaton ranked 6 for top 10 Ecobrickers all from Rodriguez District II teachers with the help of students Ecobrickers.

The findings indicated that eco bricking helps lessen the solid waste in the schools and community, it also helps the students, parents, guardians and teachers be concerned for our environment.

CONCLUSION

Based from the results, the following conclusions were decided:

1. There is no significant difference in the impact of the Project HOME the in terms of the respondents' profile.
2. There is improvement of the solid waste management in schools and community.
3. There is empathy and care for the environment from parents, guardians, teachers and especially for the students.

RECOMMENDATIONS

On the bases of findings and conclusions drawn in this project, the following recommendations are hereby presented.

1. The Project H.O.M.E (Helping Our environment by Making useful Ecobricks) may be used in different schools and communities within the Division of Rizal for improving the solid waste management particularly with single – used plastics.
2. Environmental awareness should be developed among students, parents, guardians and teachers, making them more sensitive and responsible for our Mother Earth.
3. There is a need of continuously gathering, documentation, validation and updates of data for purpose of integration of the curricula for the Project H.O.M.E. Good relationship within the schools and communities must be maintained.
4. Additional projects to be proposed that are parallel within other projects relating in the environment.

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YNARES ECO SYSTEM or YES TO GREEN PROGRAM

Republic Act 9003 Solid Waste Management Act

Deped Order No. 72 series of 2003 Establishment of Youth for Environment in Schools Organization
Rosalie L. Fuentes (Certified Trainer, Global Ecobrick Alliance)
Glenda Damias (Facilitator of Ecobricks Philippines)
ecobrick.org
Global Ecobrick Alliance
https://www.youtube.com/watch?v=PEwkavOvMSI
https://www.youtube.com/watch?v=Ynh0RYORsOM
www.GoBrik.com