

# CSU Main Campus Waste Characterization Quantification

08/18/2011 10:51





# Methods

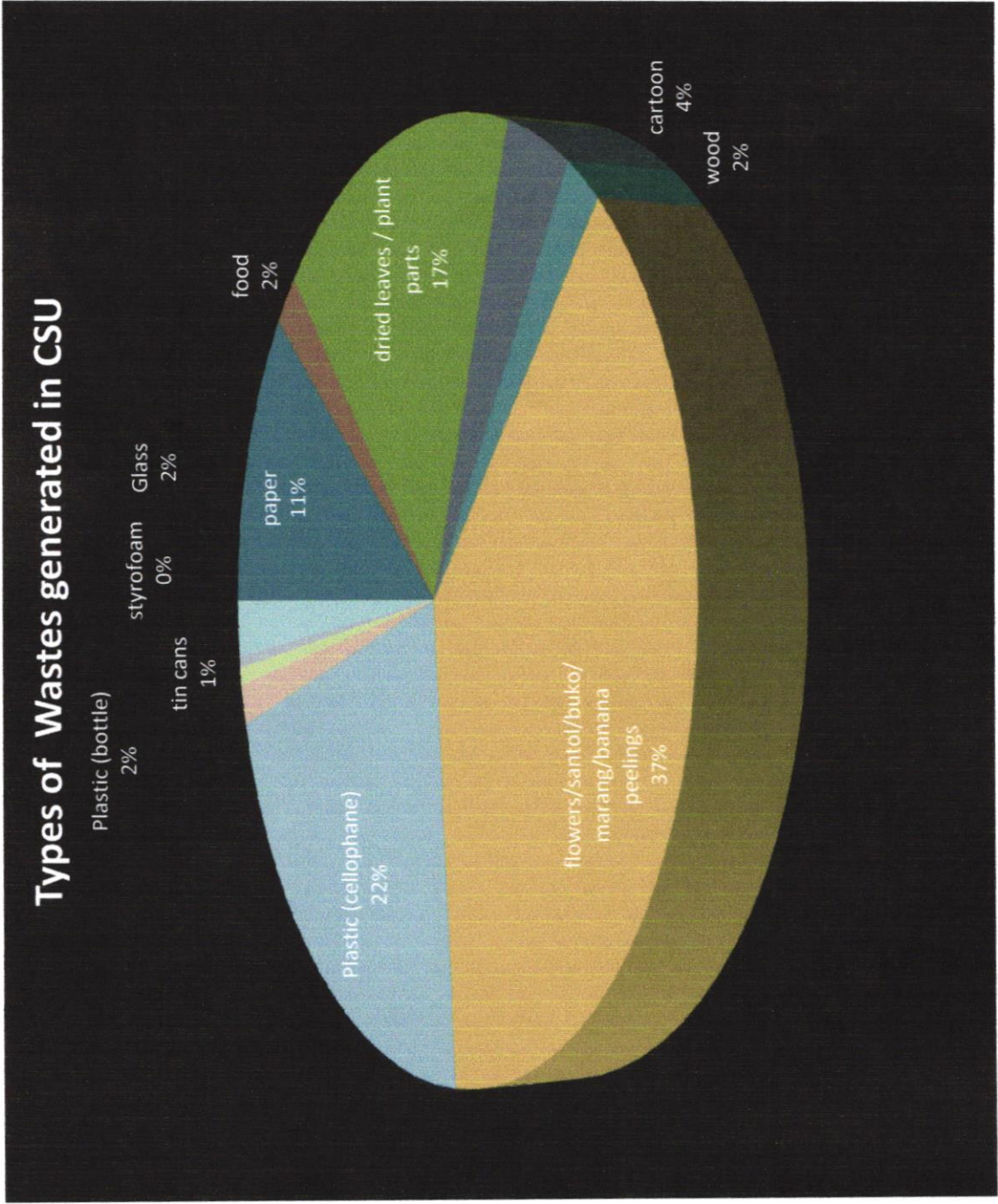
## CSU Main Campus Wastes

- Collect from trash bins / garbage storage
- Sort
- Count / weigh

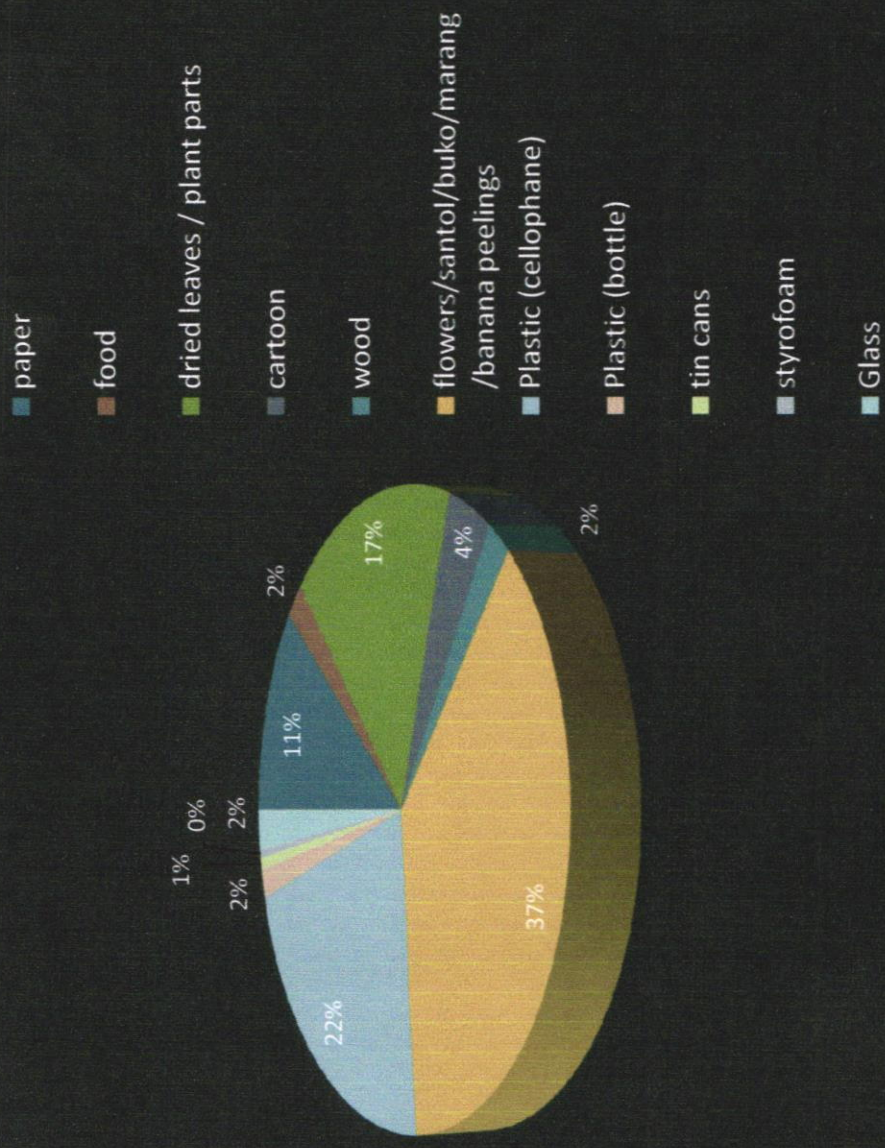
## Duration:

4 collection trips = 2 weeks

# Results

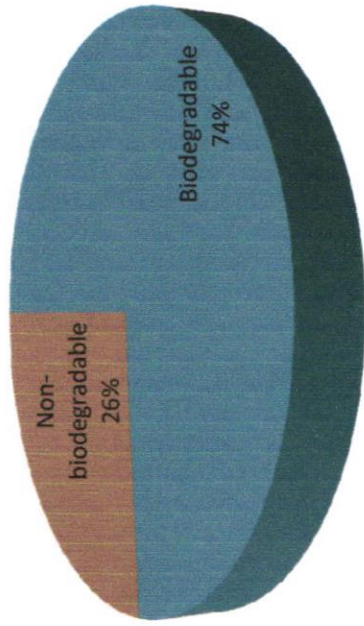


## Types of Wastes Generated in CSU

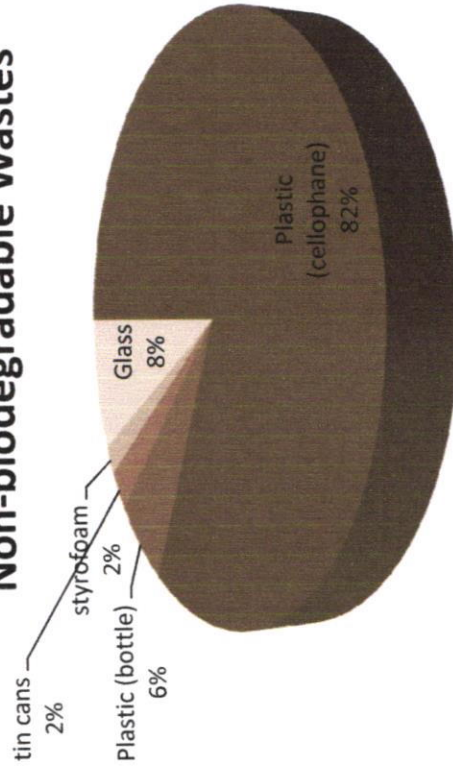




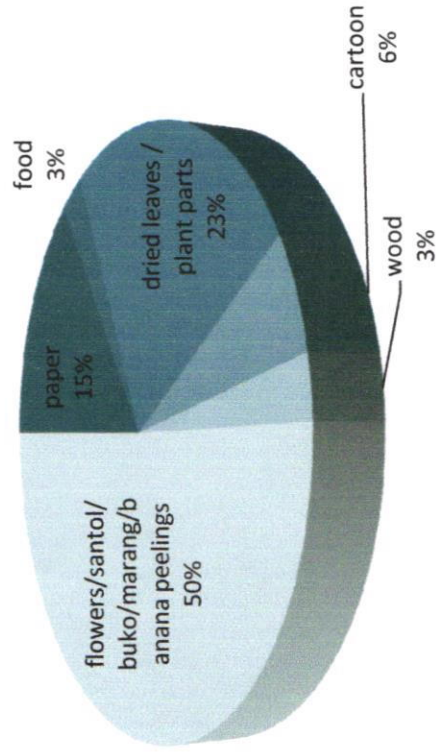
# Percentage of Wastes Generated in CSU (2 weeks)



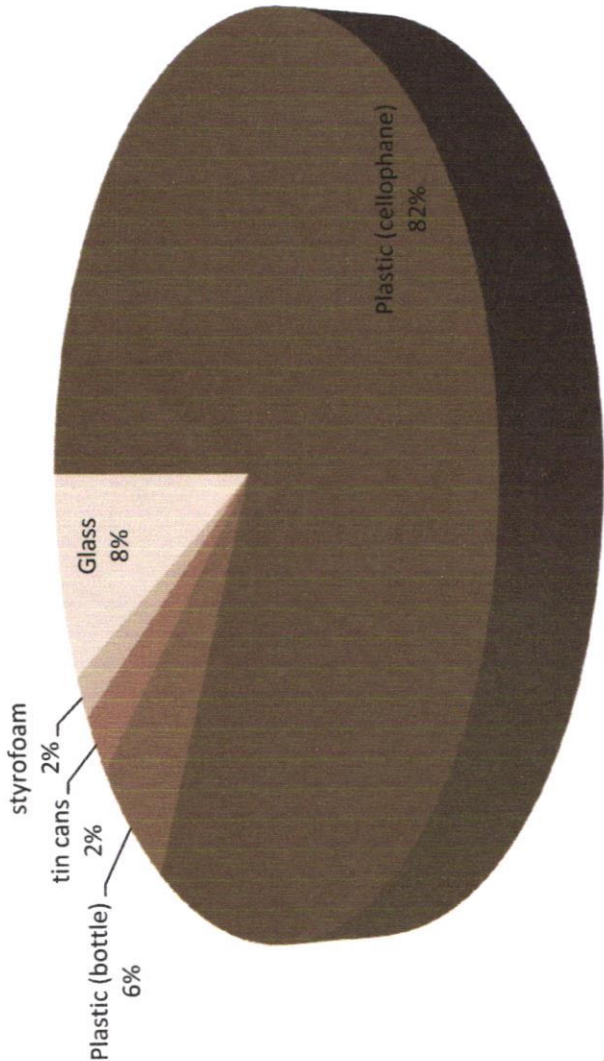
## Non-biodegradable Wastes



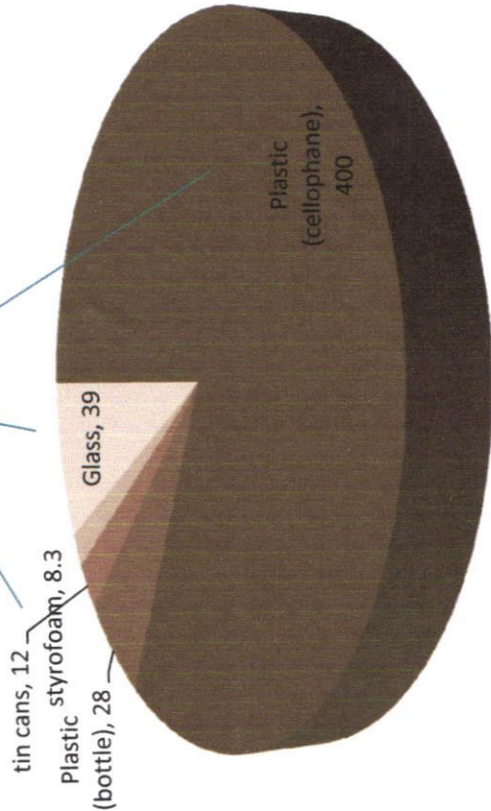
## Biodegradable Wastes



Non-biodegradable Wastes



Residual waste





Residual Wastes =  
1.1 Tons per month



# Cash in Trash?

Volume of Wastes in kilograms Generated from CSU Main Campus

<i><b>Non-biodegradable</b></i>	18-Aug-11	22-Aug-11	25-Aug-11	1-Sep-11	Total (2wk)
Plastic (cellophane)	91	84	110	115	400
Plastic (bottle)	6	7	8	7	28
tin cans	2	3	3	4	12
styrofoam	1.3	0	7	0	8.3
Glass	18	0	21	0	39
<i><b>Biodegradable</b></i>					
paper	58	41	52	53	204
food stuff	7	8	10	11	36
dried leaves / plant parts	79	54	98	84	315
cartoon	34	18	13	12	77
wood	25.6	5	0	10	40.6
flowers/santol/buko/marang/banana peelings	148	147	195	196	686



# Cash in Trash?

Volume of Wastes in kilograms Generated from CSU Main Campus

<i>Non-biodegradable</i>	18-Aug-11	22-Aug-11	25-Aug-11	1-Sep-11	Total (2wk)
Plastic (bottle)	6	7	8	7	28
28 kl x 3 pesos per kilo x 2 = <b>168 pesos per month</b>					
tin cans	2	3	3	4	12
12 kl x 5 pesos per kilo x 2 = <b>120 pesos per month</b>					
<i>Biodegradable</i>					
paper	58	41	52	53	204
204 kl x 1.5 pesos per kilo x 2 = <b>306 pesos per month</b>					
cartoon	34	18	13	12	77
77 kl x 2 pesos per kilo x 2 = <b>308 pesos per month</b>					
Total Amount to be generated from Garbage = <b>PhP 900 / month</b>					

# Interventions based on the Results of the Survey

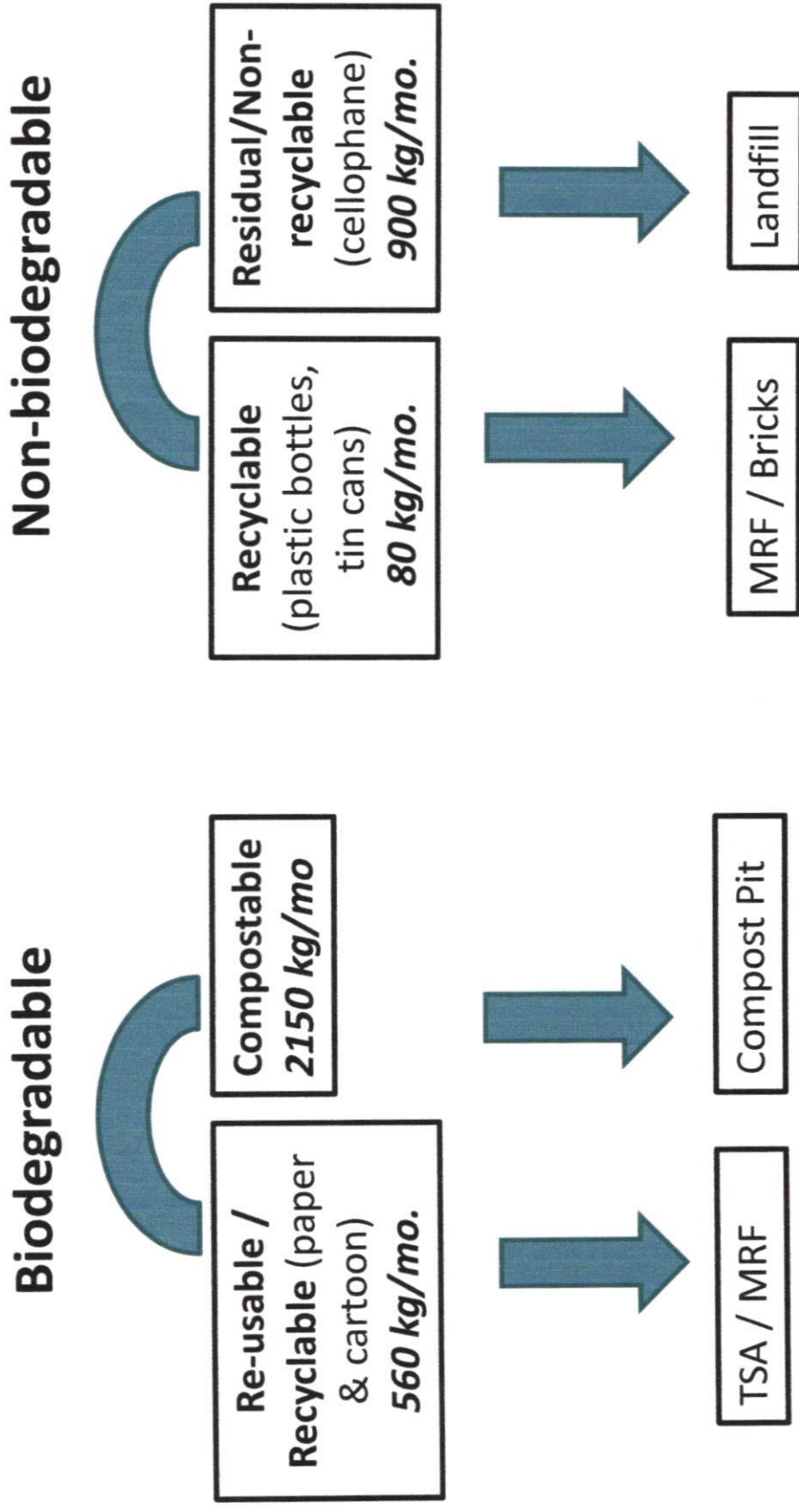
- Compost pits for Biodegradable materials
- Material Recovery Facility (3 compartments)
- Only residual wastes should be collected by City Garbage Collector
- Vermicomposting and Trichoderma-aided decomposition in compost pit sites
- Temporary storage of used paper
- Coordinate Junk shop buyers for recyclable wastes



# What have done so FAR...

- Baseline Data on Wastes Characterization
- Allocation of 10K for ESWM activities
- Identification of compost pit (3m x 6m) location in the campus (3 sites initial)
- Painting and printing of Garbage Boxes
- Finalist for 2011 National Search for Sustainable and Eco-friendly Schools

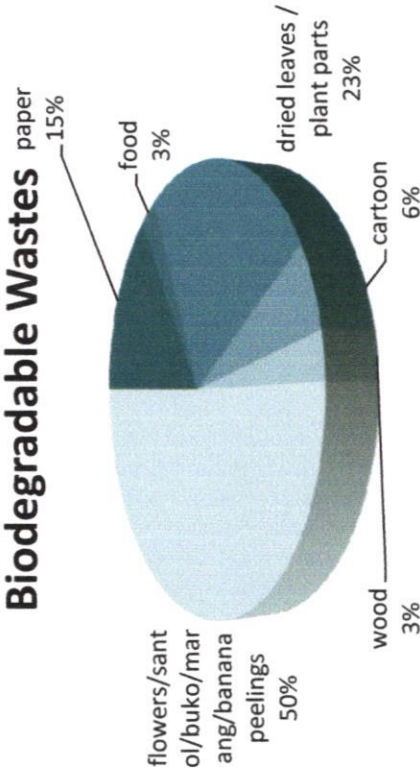
# Framework/Process Flow of CSU Solid Wastes





# Next Steps

Activity	Person In-charge	Target Date
1. Review of Environment-related Aspects of the University Policy		
2. Excavation of Compost pits (5)		
3. Vermicomposting and Trichoderma-aided decomposition in compost pit sites		
4. ESWM Fun Run - Family day		
5. Write Article on CSU ESWM initiatives		
6. Drafting of CSU ESWM policies and plan		





**Caraga State University**  
Ampayon, Butuan City

**CSU Solid Waste Management Initiatives and Accomplishments**

**Creation of Ecological Solid Waste Management-Task Force**

The Office of the President created an Ecological Solid Waste Management Task Force per Memorandum No. 24s, 2011. The members are Dr. Lilia Boyles (Head of the University Vermiculture Project), Dr. Raquel Balanay (Director of the Planning Office) Engr. Marilou Umpad (Director of the General Services Unit), Engr. Sonia Buscano (Coordinator of the Mining Engineering Program), Mr. Henson Dejarme (Director of the Office of the Students Affair), Mr. Felmer Latayada (Chairman of the Natural Sciences Department), Ms. Aisa Manlosa (Instructor of the Environmental Science Program) and Mr. Romell Seronay (Coordinator of the Masters in Environmental Management and Head of the recently organized task force). The major responsibility of the Task Force is to formulate and coordinate the implementation of CSU Solid Waste Management Policy and Plan.

**CSU is 2011 National Search for Sustainable and Eco-Friendly Schools Finalist**

Caraga State University (CSU) made it to the finals in the 2011 National Search for Sustainable and Eco-friendly Schools after having been declared as Regional Winner for the tertiary category.

On August 8, 2011, a composite team from DENR-EMB 13, CHED-13, Smart Communication, and Private sector representative validated the university's entry. During the visit, Mr. Romell A. Seronay, SWM promoter who leads in making the CSU entry possible, presented a short video on the environment- related activities of the university, followed by the guided tour in the CSU campus.

The team visited the Biodiversity Conservation Project that showcase the Rainforestation Farming of Philippine native tree species, Vermicomposting project, Orchidarium, Tissue Culture Laboratory, vegetable garden, and grown-up trees from tree planting activities. Billboards and posters showing environment-related advocacy were also evaluated. CSU, as the regional winner, received a certificate of recognition and PhP 10,000.00 cheque awarded on September 26, 2011 at Prince Hotel in Butuan City.

The National Search for Sustainable and Eco-Friendly Schools (SSES) was launched in 2009 as a partnership program between the Department of Environment and Natural Resources, thru the Environmental Management Bureau, the Department of Education, Commission on Higher Education, and SMART Communications, Inc. For 2011, the National Search for Sustainable and Eco-Friendly Schools is in place to give recognition to the environmental initiatives of schools all over the country. The SSES aims to encourage schools/academic institutions to become more

actively involved in environmental issues at a practical and local level; and to develop skills and understanding among the students, faculty and school administrators in initiating active responses and increasing community awareness and participation on environmental concerns.

**ESW Survey**

The survey on the actual characterization and quantification of solid wastes generated in Caraga State University Main Campus was conducted to provide input for the development of a university Ecological Solid Waste Management Plan. The main purpose of the survey was to determine the volume of the various solid wastes generated and their corresponding percentage.

Quantification of wastes was done few hours prior to the collection of garbage by the Butuan City garbage collector for a total of four different period's equivalent to 2 weeks generation of solid waste. Actual weighing of the different type of wastes was done with the use of a weighing scale (**Fig. 1**). Personnel from the General Services of the University were instructed to conduct the waste characterization survey.

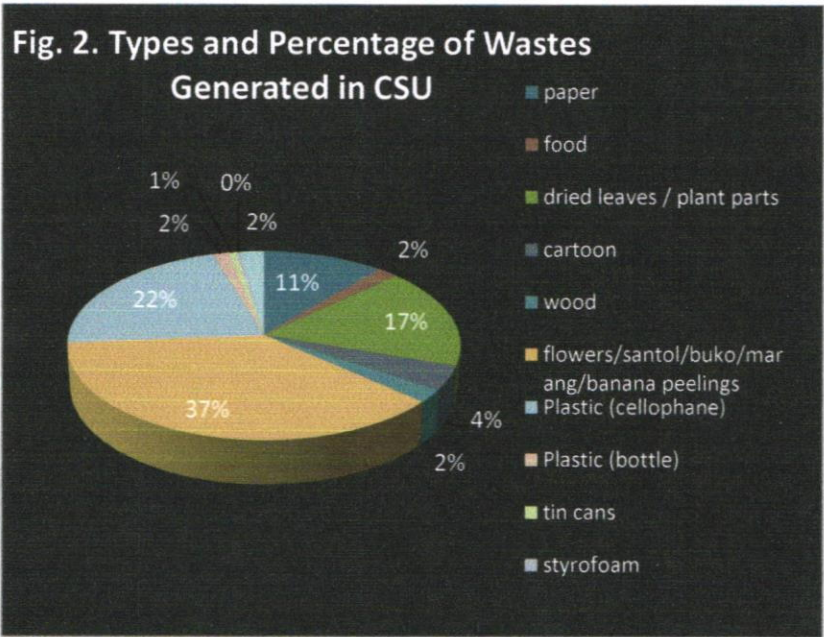


**Figure 1.** General services personnel conducted the actual weighing of different types of solid wastes.



Results

The survey showed that the breakdown of the CSU wastes is as follow:

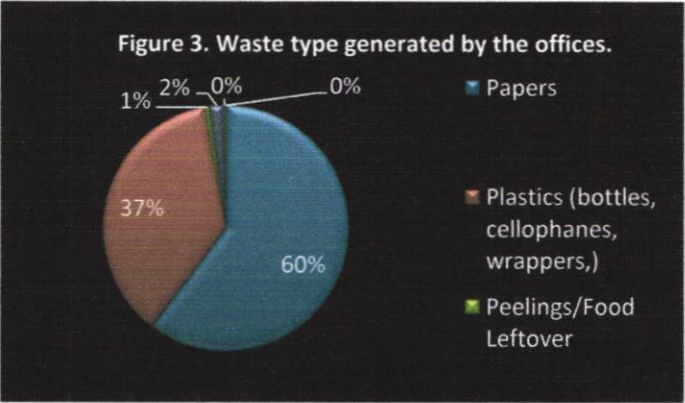


Office Wastes

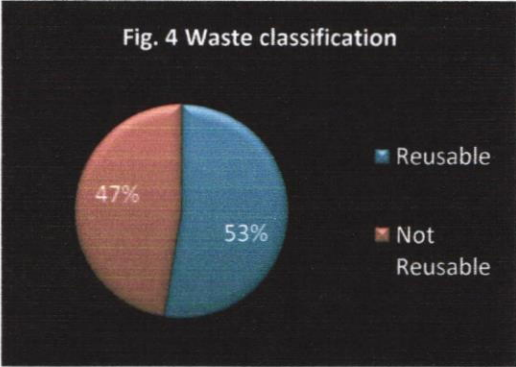
The survey on solid waste generation in the different offices of Caraga State University was conducted to supplement the actual waste determination and weighing conducted at the university collection site. Results of the survey only showed the type of wastes and the number of pieces from each type generated by the office. Accurate weighing in of the wastes was not done because of lack of a weighing scale to serve the purpose of a weeklong monitoring for every office. Both office representatives and student assistants were asked to participate in the survey.

The purpose of the survey was to determine the percentage of each waste type generated in the CSU offices.

The survey showed that the breakdown of the office wastes are as follow:

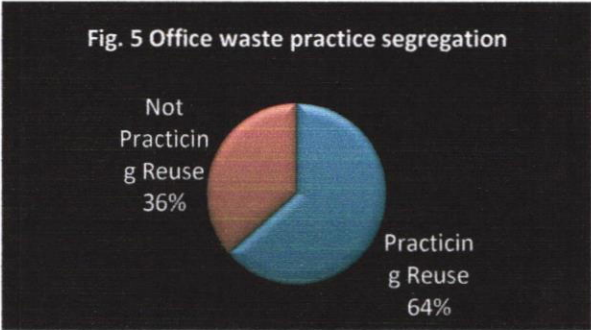


The survey found that majority of the wastes generated by the offices is reusable as shown in the graph below.



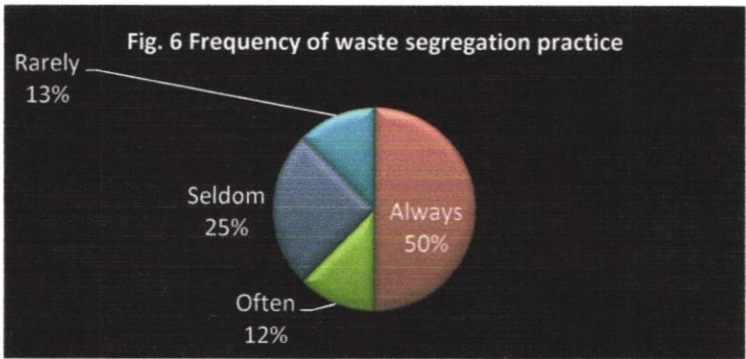
Since a greater percentage of wastes produced at CSU are biodegradable and reusable, there is a greater opportunity to implement initiatives for waste reduction and waste maximization that can lead to generation of income from discarded materials through such activities as composting (for biodegradables), and selling of junk (e. g. paper, boxes, plastics, electronics).

Moreover, it was found that majority of the offices in the university are practicing waste segregation. This is shown in the graph below.



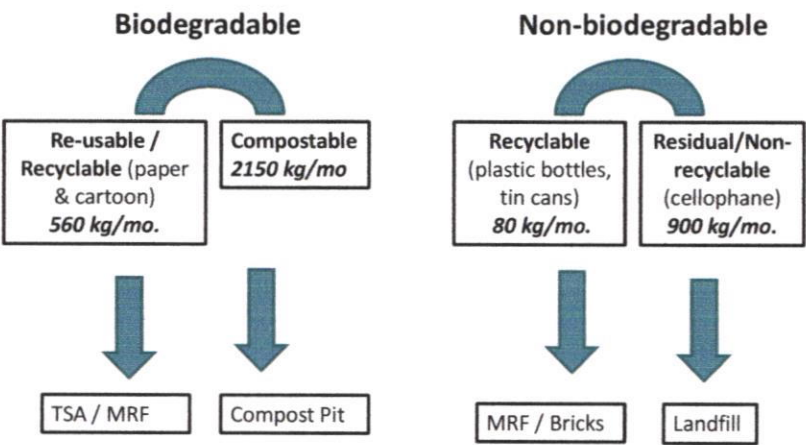


Of the offices practicing waste segregation, the different levels of compliance were determined as follow:



The different offices of the university are following the practice of reusing the other side of used paper for printing and other writings. The practice of waste segregation however, has not been followed.

### Framework/Process Flow of CSU Solid Wastes



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## News Article on the Initiatives of the Ecological Solid Waste Management Task Force

### CSU goes Solid Waste-Conscious

Recognizing the impetus of Republic Act 9003 otherwise known as the Ecological Solid Waste Management Act of the Philippines, Caraga State University has taken the initiative to draft a University Ecological Solid Waste Management Plan.

The drafting of this plan will be another milestone for the institution in its pursuit to become a sustainable and eco-friendly university. The Office of the President facilitated relevant activities by first creating an Ecological Solid Waste Management Task Force. The members are Dr. Lilia Boyles (Head of the University Vermiculture Project), Dr. Raquel Balanay (Director of the Planning Office) Engr. Marilou Umpad (Director of the General Services Unit), Engr. Sonia Buscano (Coordinator of the Mining Engineering Program), Mr. Henson Dejarme (Director of the Office of the Students Affair), Mr. Felmer Latayada (Chairman of the Natural Sciences Department), Ms. Aisa Manlosa (Instructor of the Environmental Science Program) and Mr. Romell Seronay (Coordinator of the Masters in Environmental Management and Head of the recently organized task force).

Meetings were conducted to outline how to best achieve an effective solid waste management strategy in the university. Activities initiated to determine the solid waste generated by the university include waste characterization (waste type determination and weighing) in the common garbage collection area of CSU, and waste generation survey in various university offices. Conservative estimates determined by the above-mentioned activities show that the huge waste generated was classified as biodegradable wastes with 2.7 tons per month or 74% of the total volume of wastes while non-biodegradable wastes generated 970 kilograms per month. These estimates will provide the justification and basis in the creation of the ESWM Plan.

The next prong in the plan for the effective adoption of RA 9003 is the preparation of compost pits in selected areas in the campus to convert biodegradable wastes into compost that may later be sold for income. The use of *Trichoderma* to hasten the decomposition process for these wastes is also being looked at as an option to maximize the benefits that will later be generated. Moreover, the addition of segregated garbage bins in strategic points in the campus is being considered. This initiative is in line with the Clean Ground, Zero Waste Program of Butuan City with the full implementation of proper solid waste management thru the "No Segregation, No Collection" Policy.



It is worthy to note that the university was recently given the distinction as the winner for the Regional Search for Eco-friendly and Sustainable School spearheaded by the Department of Environment and Natural Resources. The ten thousand-peso award will be utilized by the task force to jumpstart its planned activities.

Essentially, it is recognized that Information, Education and Communication (IEC) is a critical component for the success of any project. The task force deems it necessary to raise the consciousness of the university constituents regarding the waste generation rate of each individual and how a concerted effort in bringing down this rate is likely to make a significant difference in the university's contribution to the waste generated in the city scale. The recently organized Fun Run for Solid Waste Management on September 30, 2011 was a strategic undertaking during the CSU Family Day to incorporate environmental consciousness among the university populace. Donations from that event will be similarly used to further environment-friendly undertakings.



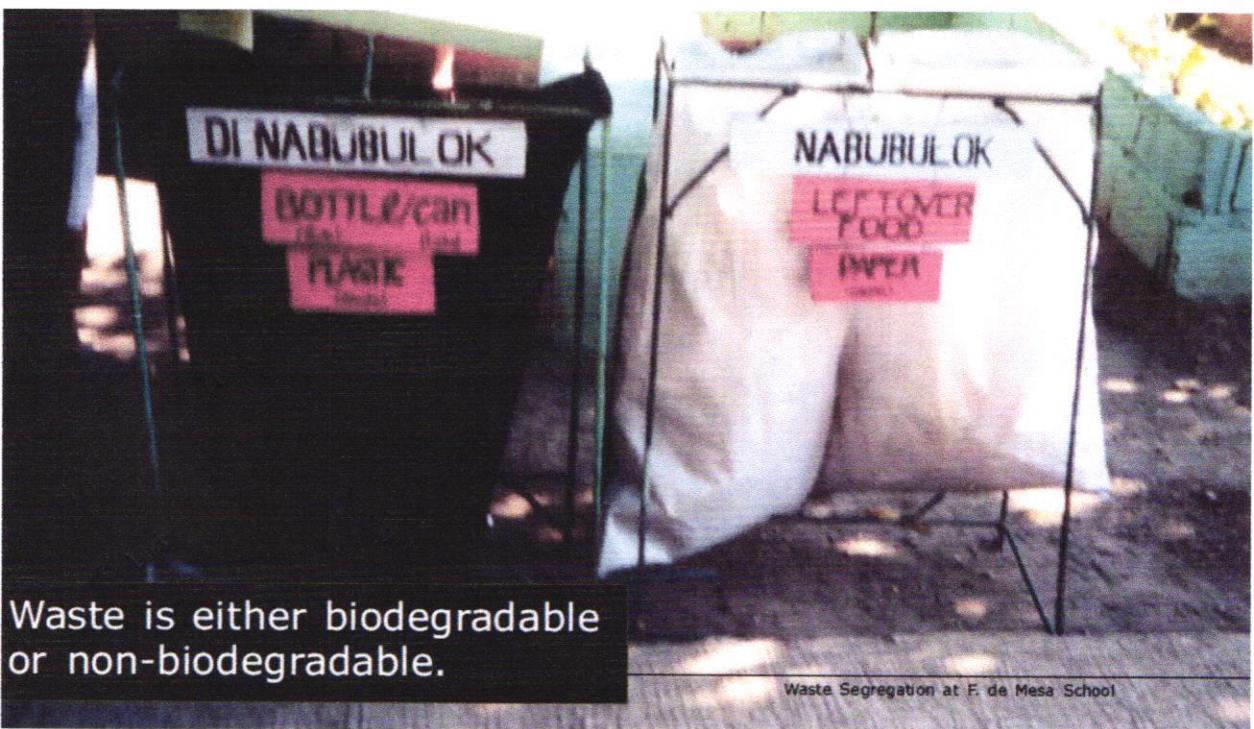
General services personnel of the University conducted the characterization of solid wastes generated in CSU Main Campus.





Final Disposal

Elevated compost piles, University of the Philippines, Diliman



Waste is either biodegradable or non-biodegradable.

Waste Segregation at F. de Mesa School





Engineering

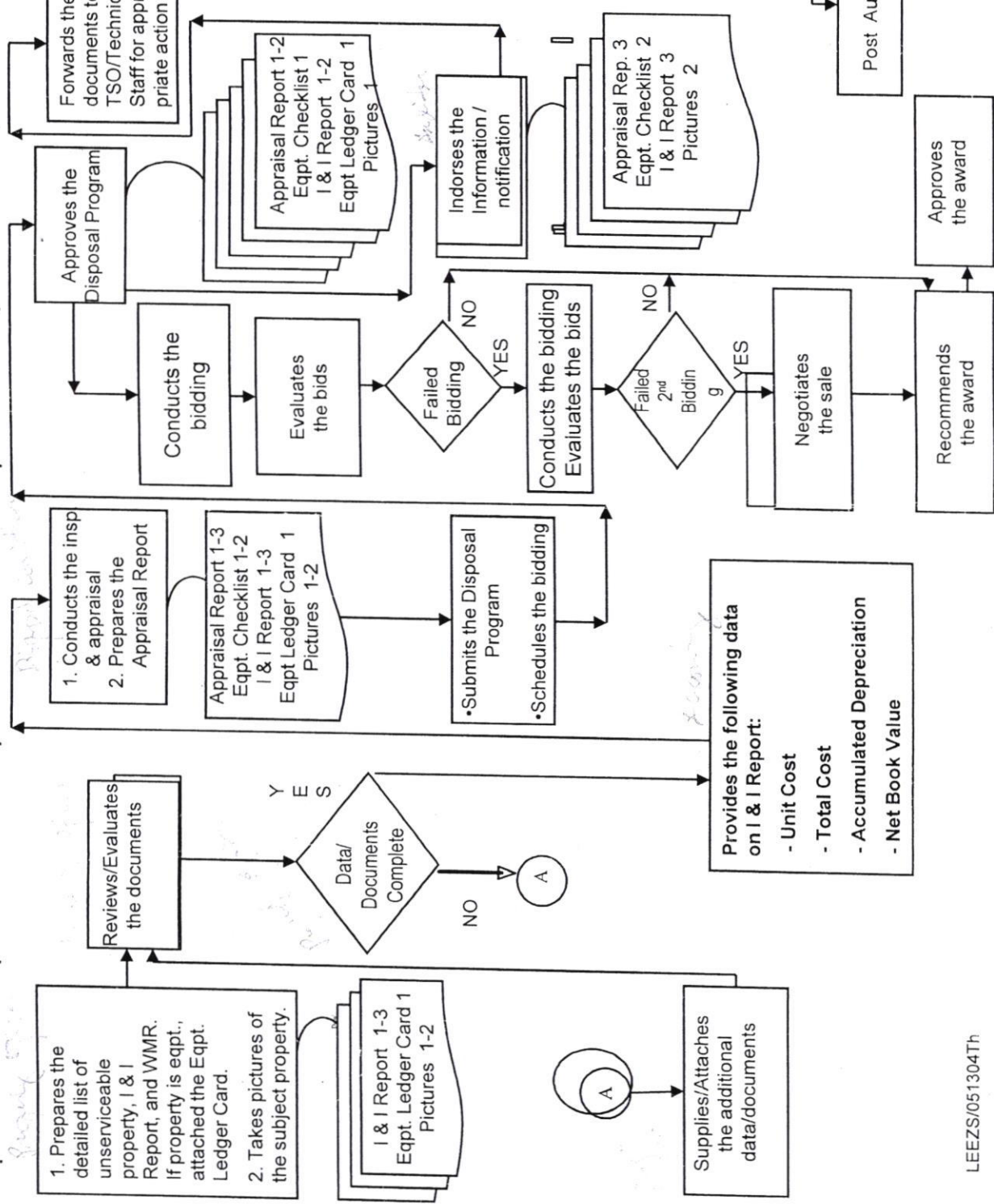
Compost pit in Stella Maris



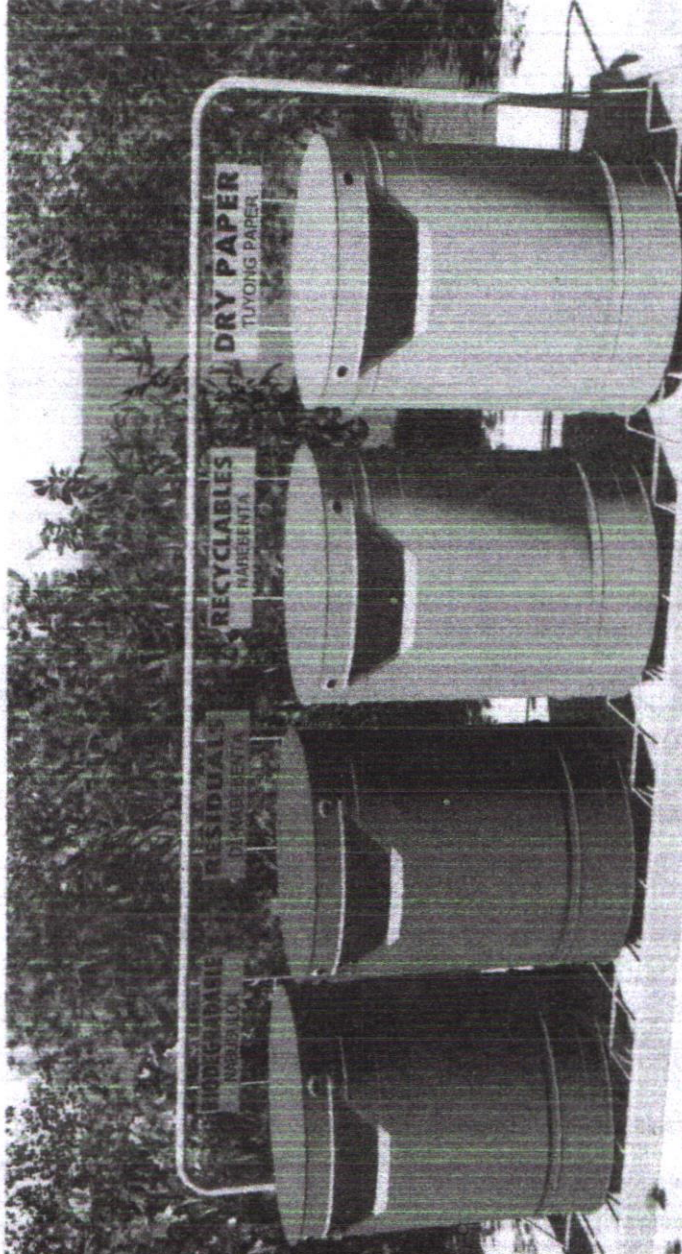
# FLOW CHART OF THE DISPOSAL OF PROPERTY

## AGENCY OFFICIALS

Property Officer / Admin. Officer / Accounting / Disposal Committee / BAC ON DISPOSAL / Director/HODE / Auditor







## GARBAGE BIN

### LEGEND:

- |                         |                              |
|-------------------------|------------------------------|
| 1. MAIN GATE            | 6. CANTEEN                   |
| 2. COLLEGE OF EDUCATION | 7. ADMIN. BUILDING           |
| 3. CASNR                | 8. SANCHEZ GYM               |
| 4. CEIT                 | 9. COLLEGE OF ARTS & SCIENCE |
| 5. SCIENCE & TECHNOLOGY | 10. ANNEX 2                  |

LOCATION

PROJECT TITLE

**PROPOSED  
GARBAGE BIN  
&  
PET BOTTLE TOWER**

DESIGN BY

REVISION NO.

CHECKED

APPROVED

**RAGA STATE  
UNIVERSITY**  
RAGA STATE UNIVERSITY, AGARTALA, TRIPURA  
WATER & POWER SUPPLY  
PROJECT NO. 100/2000

**PROPOSED  
GARBAGE BIN  
&  
PET BOTTLE TOWER**

DESIGN BY

REVISION NO.

CHECKED

APPROVED

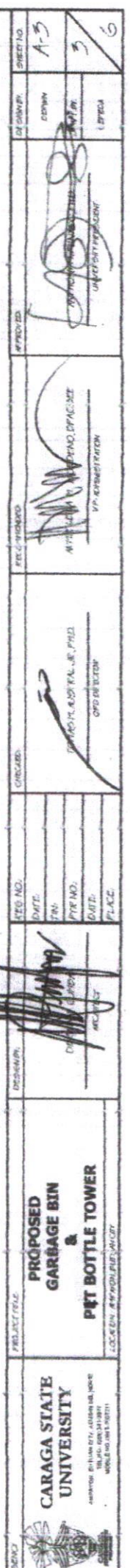
**APRIL 10, 2000**  
APRIL 10, 2000, 10:00 AM  
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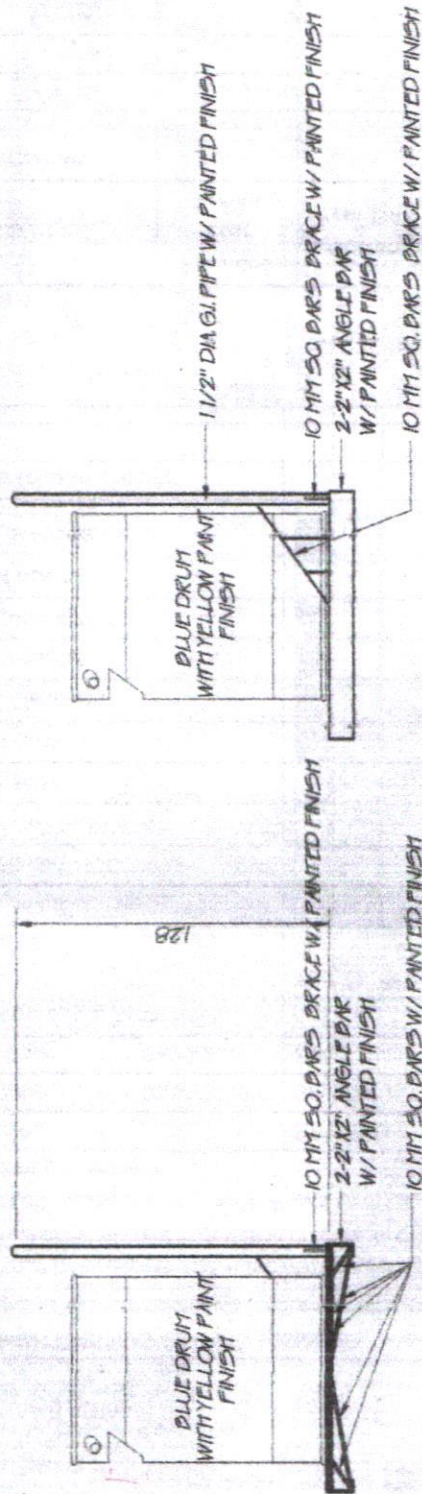












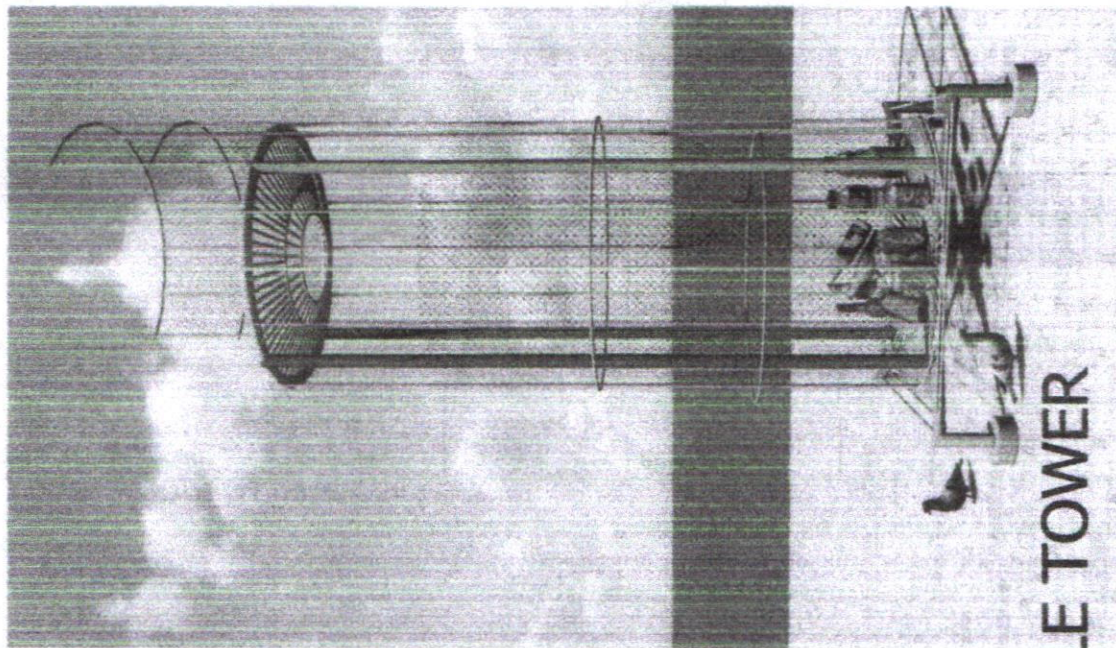


SIDE ELEVATION

SECTION

 <b>CARAGA STATE UNIVERSITY</b> <small>AMERICAN CITY, AGUAS CALIENTES, CANTO          TULAGU, 6800 SAN JUAN          CEBU, 6010</small>	<b>PROPOSED          GARBAGE BIN          &amp;          PET BOTTLE TOWER</b> <small>LOCATION: REPUBLICAN CITY</small>	DESIGNER:	DATE:	REV. NO.:	CHECKED:	PROJECT NAME:	APPROVED:	DESIGNED BY:	DISTRICT NO.:
		 DATE:	DATE:	DATE:	DATE:	DATE:	DATE:	DATE:	DATE:
		TULAGU, AGUAS CALIENTES, CANTO TULAGU, 6800 SAN JUAN CEBU, 6010		TULAGU, AGUAS CALIENTES, CANTO TULAGU, 6800 SAN JUAN CEBU, 6010		TULAGU, AGUAS CALIENTES, CANTO TULAGU, 6800 SAN JUAN CEBU, 6010		TULAGU, AGUAS CALIENTES, CANTO TULAGU, 6800 SAN JUAN CEBU, 6010	
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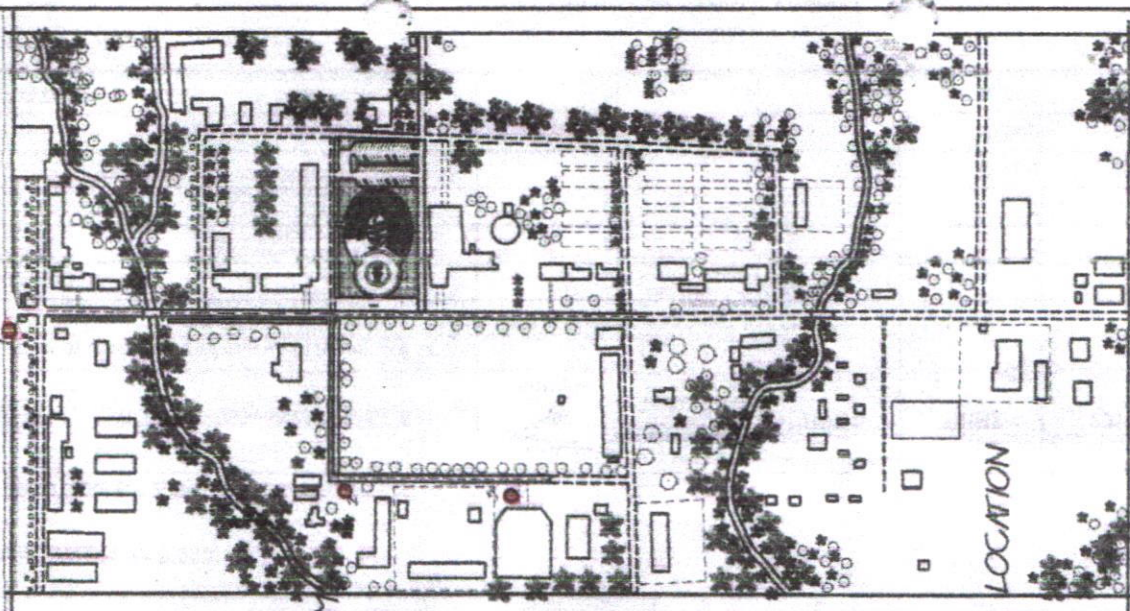




# PIT BOTTLE TOWER

LEGEND:

1. MAIN GATE
2. CANTEEN
3. SANCHEZ GYM

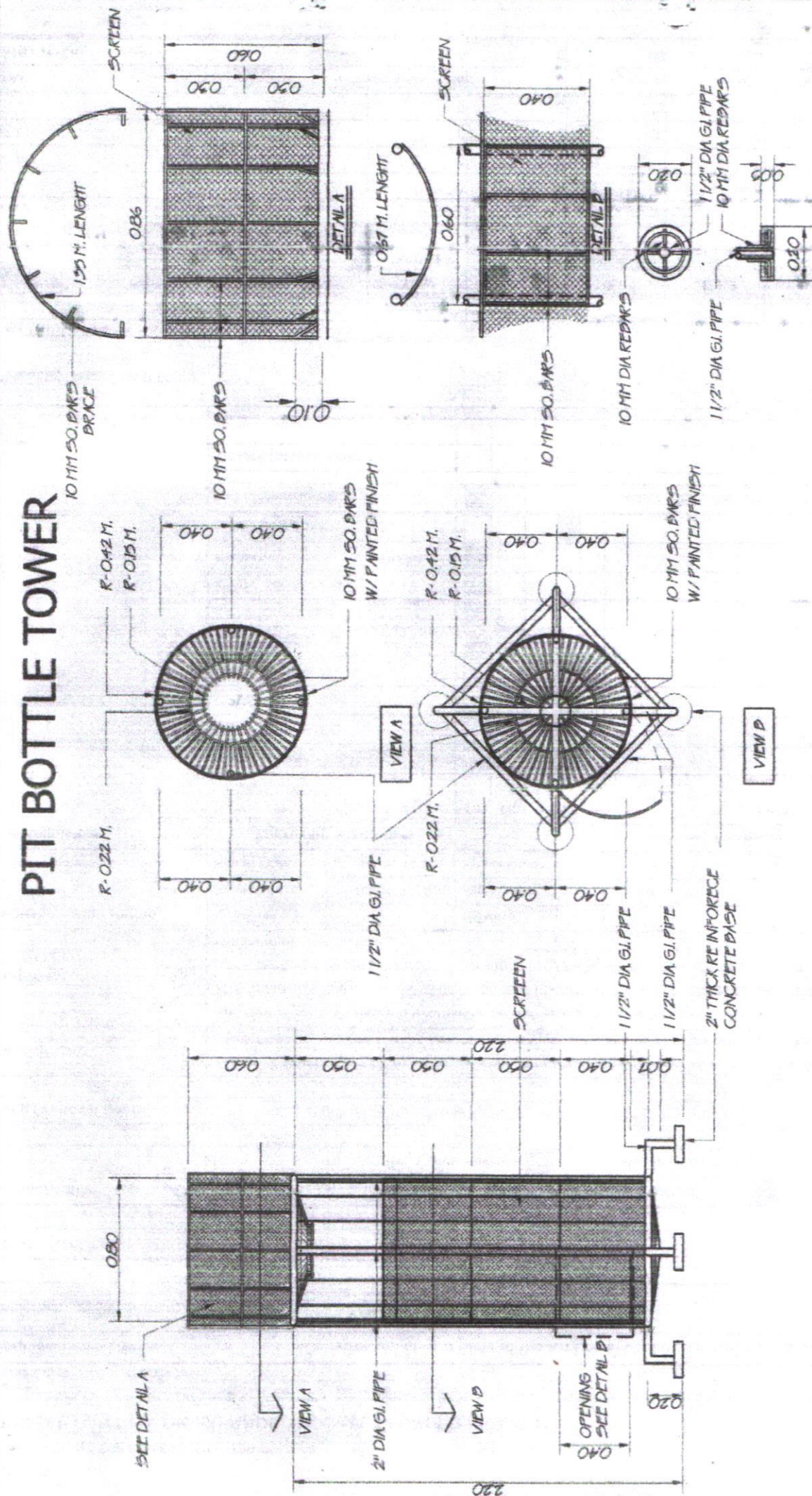








LOCATION

[illegible]



# PIT BOTTLE TOWER



 <b>CARAGA STATE UNIVERSITY</b> <small>AGRICULTURE, MANUFACTURE, EDUCATION, COMMERCE THE UNIVERSITY OF CARAGA CARAGA DEL SUR PROVINCE</small>	<b>PROPOSED GARBAGE BIN &amp; PET BOTTLE TOWER</b>	DESIGNED BY:  DATE: <u>2/10/2011</u> DRAWN BY:  DATE: <u>2/10/2011</u>	NO. <u>102</u> DATE: <u>2/10/2011</u> TIME: <u>10:00 AM</u> DATE: <u>2/10/2011</u> PLACE: <u>OFFICE</u>	CHECKED:  TOWN & CITY: <u>MAHABANGAL, P.D.</u> OFFICE: <u>OFFICE</u>	EXT. OFFICER: <u>LEILA M. MONTENEGRO, DPMCE</u> V.P. REGISTRATION	APPROVED:  OFFICIAL:  DIVISION: <u>ENVIRONMENTAL</u> DATE: <u>2/10/2011</u> TIME: <u>10:00 AM</u> DATE: <u>2/10/2011</u> PLACE: <u>OFFICE</u>	PROJECT NO. <u>102</u> DATE: <u>2/10/2011</u> TIME: <u>10:00 AM</u> DATE: <u>2/10/2011</u> PLACE: <u>OFFICE</u>	UNIVERSITY A-6 6 6



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