



UI GreenMetric Questionnaire

University : West Sumatra Maritime Polytechnic
 Country : Indonesia
 Web Address : <https://poltekpelsumbar.ac.id/>

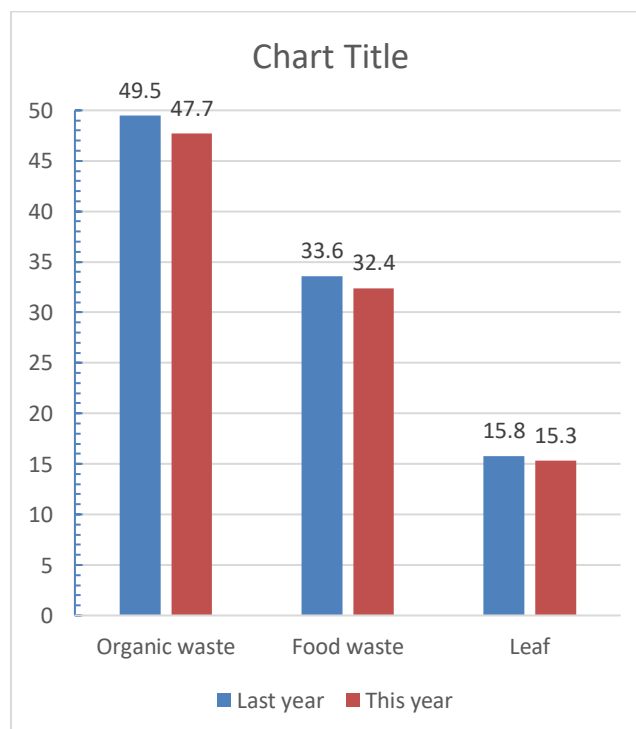
[3] Waste (WS)

[3.6] Total volume organic waste produced last year

Type of waste	amount (ton)					
	Produced		reduced	Treated		
	Last year	This Year		reused	down-cycled	up-cycled
organic	49,5	47,7	1,8		6	43,5
- food waste	33,6	32,4	1,2		6	27,7
- leaf	15,8	15,3	0,5			15,8

Description:

The West Sumatra Maritime Polytechnic is a beautiful campus environment, yet it is not immune to the waste generated by daily activities. Over the past year, approximately 49.5 metric tons of organic waste were collected from various areas across the campus. This figure encompasses all waste generated by daily activities in the kitchen, dormitories, and garden maintenance. Understanding this total helps campus officials gain a realistic picture of the campus's waste production.



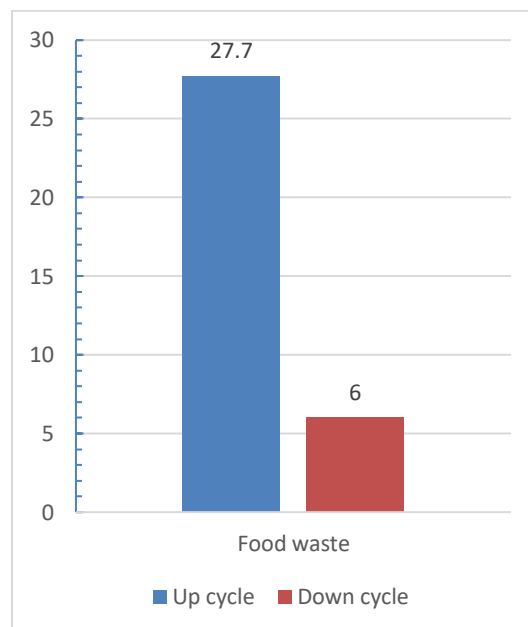
The largest portion of all organic waste on this campus turns out to stem from daily consumption activities. A total of 33.6 metric tons of this waste was identified as food waste originating from the cadet dining halls and



cafeterias. This food waste constitutes the largest share among other types of organic waste on the training campus. This information provides a clear picture of the main sector contributing the most waste on campus.

In addition to food waste, the campus's scenic landscape also generates natural materials that require management. A total of 15.8 metric tons of waste comes from fallen leaves and clippings of dry grass that are routinely cleaned up. The vast green spaces at Poltekpel Sumbar naturally produce this plant waste from time to time. It is the combination of waste from the dining hall and garden maintenance that paints a complete picture of the campus environment over the past year.

The West Sumatra Maritime Polytechnic continues to actively manage organic waste under the slogan HSSEC—Humanist, Smart, Sustainable, Eco-friendly Campus. It consistently implements a self-sufficient waste management system based on modern and creative innovations to realize its vision of a sustainable green campus. Last year, out of a total accumulated organic waste of 49.5 metric tons, food waste accounted for the largest portion at 33.6 metric tons, while the remaining 15.8 metric tons came from fallen leaves and dry grass. To break this cycle of accumulation, all of this waste is now sorted and optimally managed through various environmentally friendly innovation programs developed on campus.



Of the total 33.6 metric tons of food waste collected, the campus successfully recycled or upcycled 27.7 metric tons of food waste into new, useful products. This solution was implemented through an innovative maggot farming system that utilizes decomposing larvae to significantly reduce waste. The byproducts of this process not only reduce the environmental burden but also yield beneficial outputs such as high-protein animal feed and high-quality organic fertilizer.

The success of this decomposition cycle is due to consistent, strict daily management and monitoring. Each rearing container is well-managed, including the daily replacement of food waste to maintain optimal nutrition for the larvae. This routine monitoring also ensures that the temperature and humidity of the rearing medium are maintained so that the maggots can grow healthily. Thanks to this disciplined management, the campus's maggot farming system successfully achieved an extraordinary target by completely decomposing 27.7 metric tons of organic waste.

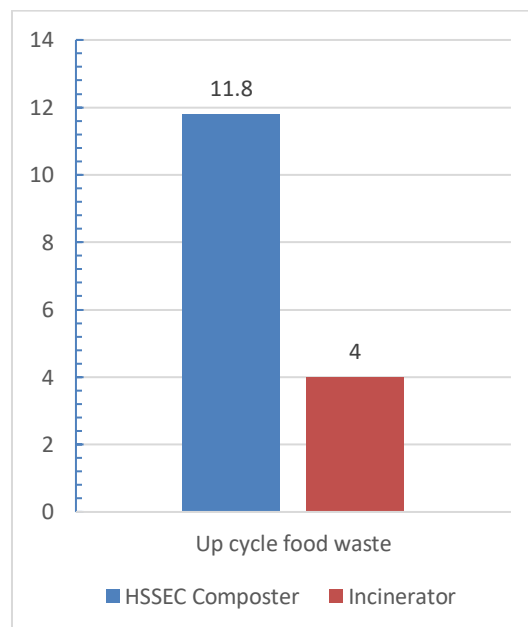
In addition to focusing on waste treatment, some of these high-quality maggots are intentionally reared until they enter the pupal stage and become adult Black Soldier Flies (BSF) for further breeding. This structured breeding process operates continuously to produce new eggs that will serve as the next generation of hosts.



With this self-sustaining and well-maintained broodstock regeneration system, the campus can ensure a sustainable supply of maggot larvae to maintain the long-term viability of the waste treatment ecosystem.

This operational cycle runs continuously, beginning with the collection of daily food scraps as larval feed, followed by monitoring the maggots' growth phase until they reach the optimal size for waste reduction. Once the decomposition process is complete, some of the maggots are harvested as a valuable product, while others are allowed to metamorphose into pupae and adult flies to produce new eggs. These eggs then hatch into a new generation of host organisms, creating a self-sustaining waste management cycle that continues to operate indefinitely.

Meanwhile, the remaining 6 metric tons of food waste are managed according to the principle of zero emissions, without polluting the surrounding environment. Through proper and measured handling, this waste is diverted into alternative utilization systems or other hygienic waste stabilization methods. This approach ensures that the entire food waste management chain on campus is completely broken down without leaving a trace of pollution in the ecosystem.



Equally innovative, the management of 15.8 metric tons of fallen leaves and dry grass was also handled systematically through a green technology approach. The HSSEC Composter innovation served as a reliable and effective solution, successfully managing 11.8 metric tons of this vegetative waste. This processing equipment transforms fallen leaves into new organic material that benefits the campus ecosystem.

The processing using the HSSEC Composter is carried out by applying a precisely measured ratio of materials. This decomposition system combines 3 parts of green waste (leaves or grass) as a natural source of nitrogen, 2 parts of horse manure to enrich macro-nutrients, and 1 part of rice husk charcoal to maintain air porosity while providing a habitat for microbes. The entire mixture is then sprayed with an appropriate amount of EM4 solution, which acts as an active decomposer to accelerate the natural and hygienic decomposition process into high-quality compost.

Through scheduled and structured composting management, this equipment's productive cycle operates continuously on campus throughout the year. By optimizing temperature, humidity, and periodic turning in the HSSEC Composter, decomposition time can be efficiently reduced, thereby accelerating the monthly production cycle. It is this consistency in productive time and the effectiveness of the biological formula that ultimately succeeded in breaking down the accumulated leaf litter and dry grass, achieving the remarkable target of 11.8 metric tons within a single year.

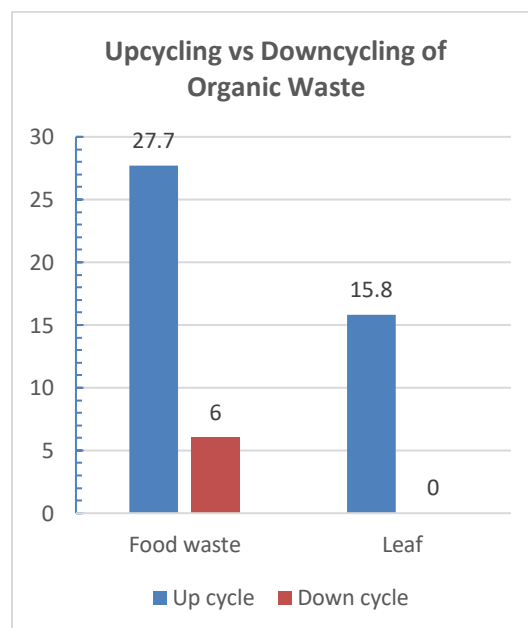


Through the HSSEC Composter system, this process successfully produces high-quality, highly fertile organic fertilizer that can be reused to green the campus grounds. The regular use of this composted fertilizer has proven effective in improving soil structure and accelerating the growth of campus vegetation, creating a much more beautiful and sustainable environment. These tangible results ensure that organic waste in the form of leaves and dry grass is not needlessly buried in landfills.

Meanwhile, the remaining 4 metric tons can be managed very effectively thanks to the introduction of a modern incinerator. This technology plays a crucial role in quickly and hygienically incinerating the remaining leaf litter and dry grass. Equipped with a state-of-the-art filtration system, this incineration process is guaranteed to operate safely without causing air pollution in the surrounding environment.

The operational process of this modern incinerator begins by sorting the remaining leaf and dry grass waste—which does not enter the composting system—and feeding it into the main combustion chamber. Inside the machine, this plant waste is incinerated at a strictly controlled high temperature, drastically reducing the volume of solid waste in a very short time. Supported by a state-of-the-art smoke filtration system, the resulting exhaust gases are filtered before being released into the air, ensuring that the entire disposal process is clean and free from harmful air pollution.

Through consistent management and a year-round burning schedule, this technology is able to optimally process accumulated leaf and dry grass residue to reach the target of 4 metric tons per year. This well-organized management ensures that yard waste no longer accumulates needlessly at landfills or pollutes the campus environment. Interestingly, the minimal ash left over from the burning process is not simply discarded but is collected and reused as raw material for making charcoal briquettes, which serve as a highly valuable alternative energy source.



Through the implementation of various green technology innovations, the campus has successfully shifted the paradigm of waste management from one that was originally a potential source of pollution to a productive and valuable circular system. In the food waste sector, the campus has successfully upcycled 27.7 metric tons of food waste, transforming it into new products such as animal feed and organic fertilizer. This optimal approach ensures that the vast majority of food waste is no longer wasted in landfills but is hygienically processed to produce outputs that generate new benefits.

This remarkable success was also complemented by the management of yard waste, specifically fallen leaves. The entire 15.8 metric tons of accumulated leaf waste was fully managed through upcycling, placing no burden



on downcycling methods. By converting fallen leaves and dry grass into high-quality compost for greening initiatives, the campus has demonstrated a tangible commitment: all organic waste is no longer a source of pollution for the surrounding environment but is successfully reintegrated into a clean and self-sustaining ecosystem cycle.

The success of this circular waste management initiative serves as clear evidence that the integration of green technology and environmental commitment can create a clean, productive, and self-sufficient campus ecosystem. Through these remarkable achievements in reducing and reusing dozens of metric tons of organic waste, it is hoped that the innovations at the West Sumatra Maritime Polytechnic will continue to develop and be refined in a sustainable manner. With consistency and the development of more advanced eco-friendly technologies in the future, West Sumatra Maritime Polytechnic will not only succeed in improving the quality of the green environment on campus but will also be able to serve as a pioneer and inspiration for other institutions in realizing a more beautiful and sustainable future for our planet.