KALASALINGAM
ACADEMY OF RESEARCH AND EDUCATION
(DEEMED TO BE UNIVERSITY)
Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A++" Grade
Anand Nagar, Krishnankoil, Srivilliputtur (Via), Virudhunagar (Dt) - 626126, Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

THE - Impact Rankings 2025

12.3.2 Proportion of Waste Recycled

Waste Recycling System:

I. The degradable solid wastes such as agricultural residues and food wastes are used for the production of fertilizers using microbial- and vermi- composting. Part of the food waste is used for the generation of biogas through the two biogas plants present in the campus.

II. Agricultural residues such as coconut sheaths are used for the preparation of reinforced composite materials and they are molded into door panel. Plant fibers are used for the preparation of sanitary napkins.

III. The treated water from the Sewage Treatment Plants is chlorinated and reused for flushing toilets using dual pipeline system and, sprinklers are used for irrigation of lawns and gardens.

IV. Silkworm waste is being used for preparing various decorative materials such as flowers, wall hangings, window strings etc. This is also used for the preparation of animal feed.

V. Neutralized liquid chemical wastes are used for the cultivation of the fern, azolla, which is used as a biofertilizer.

VI. Wood ash is used as a carrier in the preparation of biofertilizers.

Solid Waste Management:

KARE has a well-defined solid waste management policy. Solid waste generated inside the campus was collected at various points categorized as degradable and non-degradable waste using separate bins for collection. Each block's sufficient number of collection waste bins are kept and waste collected throughout the campus uniformly. The collected waste is brought to a central location by designated workers using trucks.

- **Food and Agricultural Waste Management**

  Vermicomposting: The agricultural residues and food wastes that are categorized under degradable, further it converted into biofertilizer using vermicomposting methods. On an average 1.1 tons of waste per day is being recycled resulting in about 12 tons of compost. The institution uses this compost in the agriculture farm and also sells to the farmers at a nominal cost. We are given public training to the farmers. This training promotes the circular economy by reusing agricultural waste as biofertilizer by products.

  Organic Sanitary Napkins Production: Plant fibers based anti-microbial organic sanitary napkins,preparation promoting the usage of plant fibers will practice sustainability and contribute to the environmental impacts.

  Door Panel from Waste Materials: Coconut sheath fibers produced from our farm are used in preparing composite materials to prepare door panels; they are used as a replacement for plywood.

  Biogas Plant: Part of the hostel kitchen waste is used to feed the biogas plants and the biogas produced is used in cooking conserving the use of LPG.

- **Wood Waste Management**

  Wood Dust as a Carrier for Biofertilizers: Waste Wood dust generated is being used as a carrier for microbial inoculants that are used as biofertilizers. This work is supported by a project sanctioned by DST through DST-SEED-STI Hub.

- **Concrete and Steel Waste Management**
  - **Geopolymer Bricks and Paver Blocks:** Fly ash and Ground Granulated Blast-furnace Slag (GGBS), are used as source materials for the manufacture of eco-friendly construction products such as bricks and paver blocks.

- **Construction Waste based Concrete Bricks:** Fly ash, marble dust, granite dust, Ground Granulated Blast-furnace Slag (GGBS), wood ash generated as construction waste and paper burnt ash, sugarcane bagasse ash is used to produce low-cost construction mixture by partially replacing with conventional concrete. These wastes are mixed with conventional concrete and casted in different shapes.

Paper Waste Management

KARE is also partnering in WoW (Well-being Out of Waste), a National Recycling Initiative, by ITC Ltd, by contributing 21,110 kg of paper waste for the recycling project, amounting to saving 464 trees in a year.

- **Partnership Collaboration with Industry: Waste Management**

  Graf From Seri-Wastes: The cocoon waste from sericulture is effectively used to make eye-catching art such as flowers, garlands, dolls, pen stands, wall hangings and window strings etc. .(Public training- DSIR TDPUW/ 2022)

  Animal Feed: The waste pupae which are rich in protein source are used for the preparation of pupae feed poultry.

- **Sanitary Napkin Incinerators** are provided in Girls common rooms and hostel rest rooms. They help in disposing the used napkins in an eco-friendly manner.
- **Concrete/Steel Waste Management :** Fly ash and Ground Granulated Blast-furnace Slag (GGBS), a by-product of iron industry, are used as source materials for the manufacture of eco-friendly and economical construction products such as bricks and paver blocks by replacing the conventional techniques.

Waste Recycling Process:

<u>Vermicomposting</u>

All degradable waste (except wood dust) collected from the bins, agriculture waste collected from the farm land and food waste collected from canteen and hostels are processed to form vermicompost. Before adding the agriculture waste in the mixture, it is shredded using the shredder (1.5 tons per hour fitted with a 3 HP Motor) available for this purpose. Then the mixture is undergoing microbial composting and vermicomposting. Cultivated earthworms are separated from vermicompost, marketized and utilized for the production of vermi wash. Produced vermicompost is value added with microbes and used in the agriculture farm of the

institute and also vends to the local farmers at a nominal cost. The quality of the vermicompost was assessed and certified by the Department of Soils and Environment, Tamil Nadu Agricultural University. As an initiative of inclusive growth, farmers are given training on the procedure and the usage of the organic vermicompost.

Capacity of the shredder : 1.5 tons per hour fitted with a 3 HP Motor

Capacity of waste generated in the campus : 1.1 tons

Outcome: : 12 tons of compost

Processes involved in degradable, Solid Waste Management and the geotagged photos of collected waste, vermicompost yard, equipment and produced vermiwash and vermi biofertilizers are attached below.


EXPERIMENTAL GARDEN

3R Program for University Waste (Kalasalingam Academy of Research and Education, India) –

Vermicompost Unit for Solid Waste Management

3R Program for University Waste (Kalasalingam Academy of Research and Education, India) –

Vermiyard Unit for Solid Waste Management

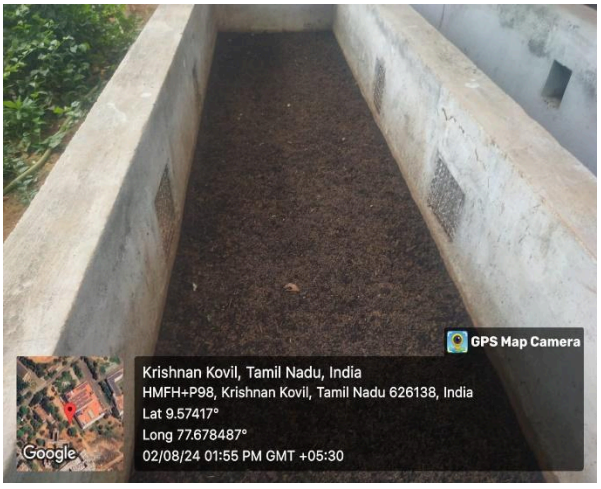
LATITUDE	9° 34' 29.56" N
LONGITUDE	77° 40' 28.50" E

3R Program: Prepared Biofertilizer from waste

LATITUDE	9° 34' 27.45" N
LONGITUDE	77° 40' 28.75" E

3R Program: Earthworm - Vermicompost

LATITUDE	9° 34' 20.69" N
LONGITUDE	77° 40' 49.65" E



3R Program: Preincubation of Waste with Cow dung after shredding for microbial degradation	**3R Program: Partially decomposed waste is transferred to Vermicompost bed and Earthworm released.**	

Organic Waste Shredder

LATITUDE	9° 34' 20.33" N
LONGITUDE	77° 40' 48.91" E

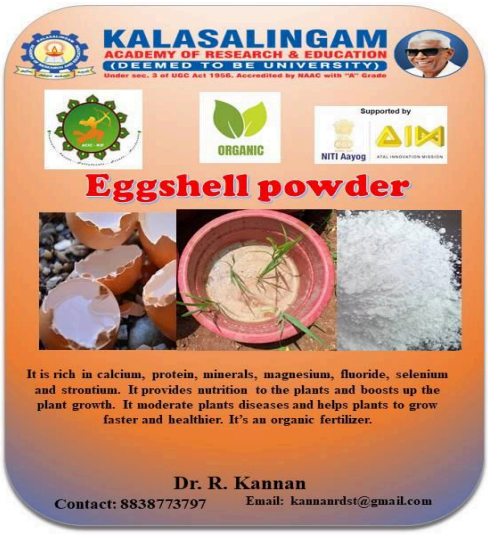
KARE, located at Krishnankoil, generates more than 1 tonne of solid waste every day, which is substantially higher than many colleges' total daily waste generation. School of Agricultural Sciences, KARE has developed technology to convert organic and food waste into nutrient rich manure. Each of the waste materials generated has a different decomposition rate in the environment. The microbial degradation of different solid waste materials within 15-17 days and the differences in decomposition rates in normal processes and inoculated consortia of bacteria, were studied. Microbes, and their impact on decomposition was also learnt in detail. Microbes play a significant part in breaking down waste and producing fine powder suitable for uptake by

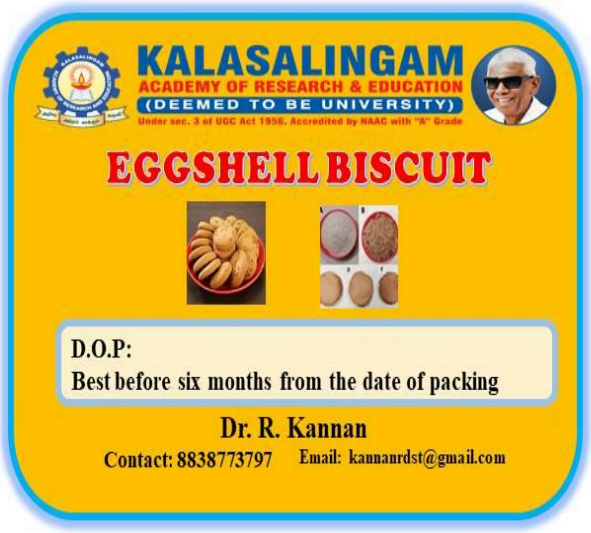
earthworms. Our hypothesis is that suitable bacterial consortia is to be used for decomposing the waste materials at a faster rate and then earthworms will be used on the decomposed product to produce vermicompost. The decomposed waste is used at the rate of 12 tonnes per month for production of vermicompost after which the 30 kg of earthworm used for the purpose will be separated from the vermicompost for sale.

The output of vermicompost from this center is 140 tonnes and the volume of earthworm produced is 0.5 tonnes annually. By selling the above product, the center is able to generate revenue of 4.5 lakhs.

1.	**Vermicompost**	**1 kg**	**10. 00**
2.	**Vermiwash**	**1 L**	**30. 00**
3.	**Earthworm (*Eisenia fetida)***	**1 kg**	**400. 00**
4.	***Azolla***	**1 kg**	**300. 00**
5.	**Micronutrient biofertilizer**	**1 kg**	**250. 00**
6.	**Macronutrient biofertilizer**	**1 kg**	**250. 00**
7.	**Enzyme mobilizer**	**1 kg**	**200. 00**
8.	**Nitrogen mobilizer**	**1 kg**	**200. 00**
9.	**EM Solution**	**1 L**	**100. 00**
10.	**Eggshell powder**	**1 kg**	**400. 00**
11.	**Vermicompost with eggshell biofertilizer**	**1 kg**	**100. 00**
12.	**Eggshell based poultry feed**	**1 kg**	**150. 00**
13.	**Eggshell based fish feed**	**1 kg**	**150. 00**
14.	**Eggshell based dog biscuits**	**250 g**	**50. 00**
15.	**Eggshell based calcium tablets**	**10 tablets**	**80. 00**
16.	**Oyster mushroom**	**200 g**	**100. 00**

17.	Oyster mushroom spawn	1 kg	120. 00





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DST-SEED-STI Hub

Department of Science and Technology (DST)
DST

AGRIBIO - I

Nitrogen, phosphorus, magnesium, and potassium are some of the most important macronutrients. Carbon, hydrogen, and oxygen are also considered macronutrients as they are required in large quantities to build the larger organic molecules of the cell.

D.O.P:
Best before six months from the date of packing

Dr. R. Kannan
Contact: 8838773797 **Email: kannanrdst@gmail.com**

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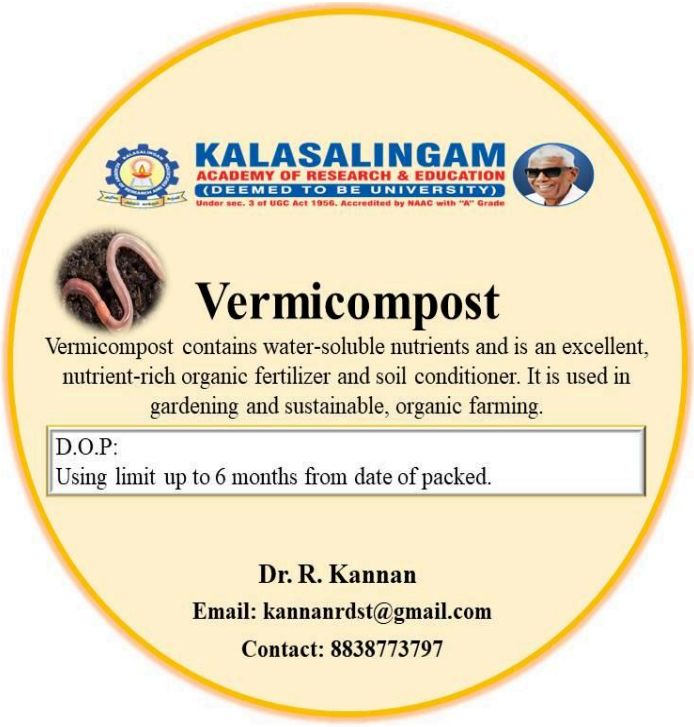
Department of Science and Technology (DST)
DST

AGRIBIO - II

Micronutrients are essential plant nutrients that are found in trace amounts in tissue, but play an imperative role in plant growth and development. Without these nutrients, plant nutrition would be compromised leading to potential declines in plant productivity. Its needed in very small amounts.

D.O.P:
Best before six months from the date of packing

Dr. R. Kannan
Contact: 8838773797 **Email: kannanrdst@gmail.com**

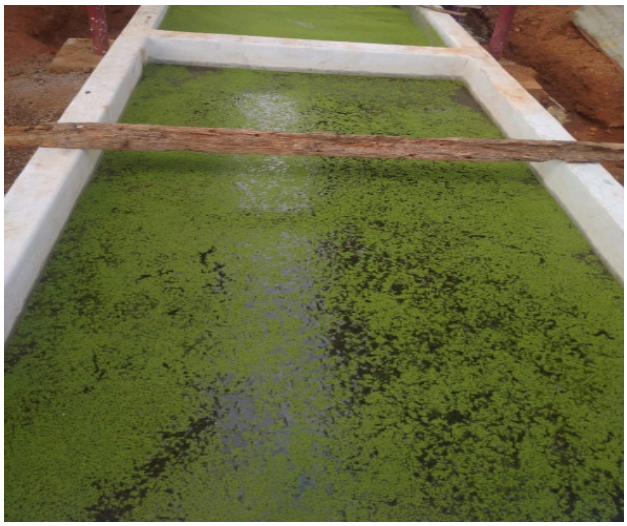


Recycling of Vegetable waste used for Mushroom cultivation

Biogas Plant

Type of organic waste	Total Produced (ton)
Food waste	193
Leaf waste	110
Paper, cloth etc.	93
TOTAL	396

Biocomposting Unit



E-Waste Recycling:

Our Policy emphasizes adapting environmentally friendly recycling practices. We strictly adhere to the regulatory requirements of all relevant legislations. We are committed to creating an awareness program among stakeholders on the need of e-waste management. We purchased the

electronics items with a buy-back policy and preference given to the vendors having a sound e-waste management process. Our E-Waste containing harmful substances including cadmium, lead, mercury are properly handed over to authorized recyclers only.

As per the Sustainable policy of Kalasalingam Academy of Research and Education (https://kalasalingam.ac.in/wp-content/uploads/2021/11/e-waste_policy.pdf) the toxic waste is handed over to the authorized vendors. From our campus separate bins and racks have been allocated for various by-products like metals , non-metals, which are recovered from dismantling. E-waste materials like computers, keyboards, mouse and printers are disposed of through TamilNadu waste management limited. While all other wastes are sold through authorized outside agents for safe disposal.

Total quantity of e-waste received with unit (Ton)	**Quantity dismantled with Unit (Ton)**	**Quantity sent for recycling with unit**	**Quantity sent for disposal with unit**
902.58156	902.58156	13.85	3.76

Certificate no.: GER2324076 Authorisation no.: 01/EWM Date: 03-10-2023

Certificate of E-waste Recycling

This is to certify that 3440 KG of E-waste collected from

Kalasalingam Academy of Research and Education,Virudhunagar

dated on 29-09-2023 against manifest number G.P.No-434 has been recycled in an environmentally friendly manner.

We thank you for your efforts in contributing towards clean & green environment.

Your next due date for disposal Jan 2024

GreenEra RECYCLERS

Aspire · Elate · Recycle

+91 8300223526 / +91 9361328436

No 37, Sivanandha Industrial Complex, Dr. MS Udayamurthy Nagar, Thadagam Road, Edayarpalayam, Coimbatore - 641025

info@thegreenera.in

thegreenera.in

Note: As per CPCB Guidelines, the E-waste materials shall not be stored more than 180 days & should be disposed off to the PCB authorized E-waste Handler.

For Green Era Recyclers

GREEN ERA RECYCLERS CBE-26

Green Era Recyclers is authorised by TNPCB