Manoharbhai Shikshan Prasarak Mandal Armori's
MAHATMA GANDHI ARTS, SCIENCE &
LATE NASARUDDINBHAI PANJWANI COMMERCE
COLLEGE ARMORI
Dist. Gadchiroli (Maharashtra) 441 208
Affiliated to Gondwana University, Gadchiroli.
Re-accredited by NAAC 'A' with 3.24 CGPA

ANNUAL QUALITY ASSURANCE REPORT
(AQAR) 2022-23

CRITERION – VII
INSTITUTIONAL VALUES & BEST PRACTICES

METRIC NO: - 7.1.3.

METRIC NAME: - *Facilities in the Institution for the management of the following types of degradable and non-degradable waste*

Web: - mgcollegearmori.ac.in
e-mail: - mgcollege.armori@gmail.com
Phone: - 07137-266558

MANOHARBHAI SHIKSHAN PRASARAK MANDAL ARMORI'S
MAHATMA GANDHI ARTS, SCIENCE &
LATE NASARUDDINBHAI PANJWANI COMMERCE COLLEGE
ARMORI Dist. Gadchiroli (M.S.) 441 208
Affiliated to Gondwana University, Gadchiroli
Re-accredited by NAAC 'A' with 3.24 CGPA(2022)
Web: mgcollegearmori.ac.in

Dr. Lalsingh H. Khalsa
Principal & IQAC Chairman
Mob. No. 9422153197
E-mail:lalsinghkhalsa@yahoo.com

Dr. Satish. S. Kola
IQAC Coordinator
Mob. 9595982057
E-mail: satish.kolawar@gmail.com

Certificate of Verification

The document herewith is a testimonial of the following specifics;

- AQAR 2022-23
- Criterion - **VII (Institutional Values & Best Practices)**
- Metric no. – **7.1.3**
- Metric Particular - Facilities in the Institution for the management of the following types of degradable and non-degradable waste.

It is affirmed that the attached document pertinent to the above cited specifics are duly verified and approved by the IQAC.

Criterion Head

IQAC Coordinator

IQAC-Co-ordinator

IQAC Chairperson

PRINCIPAL
M.G. Arts, Science &
Late N.P. Commerce College
ARMORI, Dist. Gadchiroli

M.G. Arts, Science & late N.P. Commerce College Armori

CRITERION – VII

INSTITUTION VALUES & BEST PRACTICES

METRIC NO.	7.1.3
METRIC NAME	*Facilities in the Institution for the management of the following types of degradable and non-degradable waste.*

CONTENT

Reports of Waste Management

PROJECT REPORT

On

"STUDY ON INNOVATIVE APPROACHES ON VERMICULTURE AND VERMICOMPOSTING IN COLLEGE CAMPUS"

Session 2022-23

Project Report Submitted

By

Students of B.Sc. III

Guided

By

Dr. J. N. PAPADKAR (H.O.D.)

MAHATMA GANDHI ARTS, SCIENCE AND LATE N. P. COMMERCE COLLEGE ARMORI, DISTRICT- GADCHIROLI (MS) INDIA

(Zoology Batch-2022-2023)

INTRODUCTION

Vermiculture is basically the science of breeding and raising earthworms. It defines the thrilling potential for waste reduction, fertilizer production, as well as an assortment of possible uses for the future.

Vermicomposting is the process of producing organic fertilizer or the vermicomposting from bio-degradable materials with earthworms. Composting with worms avoids the needless disposalof vegetative food wastes and enjoys the benefits of high-quality compost.

The earthworm is one of nature's mile stone "soil scientists." Earthworms are liberated and cost-effective farm relief. The worms are accountable for a variety of elements including turning common soil into superior quality. They break down organic matter and when they eat, they leave behind castings that are an exceptionally valuable type of fertilizer.

Third Year Students of department of Zoology rationalize the methodologies as well as the laboratory findings undertaken on their innovative approach on Vermiculture and Vermicomposting.

Advantages of Vermiculture and Vermicomposting

Vermiculture and vermicomposting is one of the most valuable ecological endeavors we have engaged in as it caters not only environmental protection but also helped we acquire knowledge on its proper methodology.

Vermiculture is environment friendly since earthworms feed on anything that is biodegradable, vermicomposting then partially aids in the garbage disposal problems. No imported inputs required, worms are easily available and the materials for feeding are abundant in and around campus plants leaves wastes, grasses, and used papers. It is also highly profitable, both the worms and castings are used to garden, medicinal, and campus premises plants itself.

Vermicomposting does not have any adverse effect on soil, plant and environment. It improves soil aeration and texture thereby reducing soil compaction. It improves water retention capacity of soil because of its high organic matter content. It also promotes better root growth and nutrient absorption and improves nutrient status of soil, both macro-nutrients and micro-nutrients.

Precautions for Vermiculture and Vermicomposting

For vermiculture several precautions in doing such process: -

- To ensure that the culture would turn out successful and fruitful.

- From our hands-on experiences, vermicomposting pit should be protected from direct sun light so that the worm would survive. Direct heat possibly causes the worms to die.
- Spray water on the pit as when required to maintain moisture level because worms are fond of it.
- We should also protect the worms from ant, rat, bird and excessive rain.

METHODOLOGY

Vermiculture is the science of worm composting. Worms can eat their body weight each day in fruit and vegetable scraps, leaving castings as the byproduct. Worm castings are called worm compost.

Following methodology adopted during the study: -

a) **Clean-up and Preparation of Vermi Beds**: - Our B.Sc third year Zoology group started the vermiculture project on November 25th, 2021 with the clean-up and preparation of the previously built vermiculture beds located near the auditorium, in campus. There are one vermi beds, 8 X 3 X 3 feet in size and made with bricks blocks.one small tank prepared for vermiwash. We have cleaned vermi bed and started to gather substrates.

b) **Substrate Application**: - After some days of gathering, we put the substrates to vermi beds on August28th 2018. We put a mixture of loam soil, cow dung, manure and partially decomposed leaves in the vermi bed; we put a mixture of cow dung manure, partially decomposed rice straw. The succeeding application made used of mixed and different substrates.

Before putting the substrate, we made sure that the materials are cut or break into smaller pieces. Finer materials could easily decompose. We also mixed the different media together well for the worms to easily digest these. We have moistened the materials and cover the vermi beds with roof and cover to initiate anaerobic decomposition. The substrates were kept in the beds for ten days before we put the vermi worms. It took 10 to 15 days to complete anaerobic decomposition and only then that they are ready for worm consumption.

c) **Introducing the Vermi Worms, Red wriggler (*Eisenia foetida*): -**After 10 days upon putting the substrates into the vermi beds, we introduce the vermi worms into the substrate on August 18. We used the Red wriggler (*Eisenia foetida*) in our vermicompost. Aerobic decomposition lasts for 7 – 14 days depending on the materials used and the ratio of the worms to the substrate. In our case, we have a total of 250 kilograms of substrate each bed enough to feed a one and half kilogram of worm for two weeks. Within the period, we moistened the substrate regularly to provide the right moisture (60 - 80%) for the vermi worms to grow and multiply.

d) Feeding the VermiWorms: - After introducing the red wrigglers, we fed the worms by placing garden wastes and also leave. After two weeks, the red wrigglers have eaten the food waste leaving behind worm casting or compost.

e) Harvesting of Vermicast: - Harvesting will commence 10 to 14 days or 2 weeks after stocking of worms. Prior to harvest, we refrained from watering the substrate for the last three days to ease the separation of castings from worms and likewise preventing the castings to become compact. On September 25, we had the first harvest of the vermicast or the worm manure; we actually harvested a total of 340 kilograms of organic fertilizer from the vermi bed which contains mixture of loam soil, cow dung manure and totally decomposed leaves.

f) Re-Applying Substrates: -After the harvest of the vermi cast, we applied substrates in the vermi beds anew and proceed the same procedure.

g) Re-introduction of the Vermi Worms, Red wriggler (*Eisenia foetida*): -The application of new substrates into the vermi beds require the re-introduction of the vermi worms or the red wrigglers (*Eisenia foetida*) for the continuity of the worm's culture and for their production of the vermi cast which are very good organic fertilizer. After introducing the worms into the substrates, we sprinkled it with water to keep the moisture on which worms can easily digest these substrates. And these steps will go over and over again until such time that the redwrigglers are cultured into a big number and vermicast are produced well that it can be used to gardening and handover to Botany department.

h) Using the Harvested Vermicast: - Our harvested vermicast or worm manure was used as organic fertilizer for garden plants, medicinal plants of campus The other sacks of organic fertilizers were stored for future use.

DATA AND ANALYSIS

The vermi worms used in the vermiculture and vermicomposting project came directly at the Mahatma Gandhi College, Armori, Department of Zoology. These vermi worms are identified as Red wrigglers or scientifically known as *Eisenia foetida*.

*Eisenia. foetida*is especially adapted to living in a decaying environment, especially ones such as rotting vegetables, manure and actual compost, which makes it a very good choice for vermicomposting. It does not burrow into soil, and is found in habitats where less competition for food and space for them required.

On the other hand, earthworm is one of nature's pinnacle "soil scientists." The basic body plan of an earthworm is a tube, the digestive system, within a tube, the muscular slimy, moist outer

body. The body is annular, formed of segments that are most specialized in the anterior. Most earthworms are decomposers feeding on undecayed leaf and other plant matter.

From the laboratory activity, we have observed that the vermin worms range from 1 cm to 8 cm. From the 1 kilogram introduced vermi worms, it increases 300 grams each harvest.

Vermicast. The vermicast is a good organic fertilizer and soil conditioner. It is produced by the decomposition of organic matter or agricultural wastes. High-quality vermicast can be produced by worms such as the red wrigglers (*E. foetida*). It contains humus with high levels of nutrients such as nitrogen, potassium, calcium, and magnesium.

The vermicast produced in the project was black and crumbly. It is rich in nutrients. It will be used in gardens, landscaping,in around college campus. The vermicompost itself is beneficial forthe land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil.

Indeed, the use of red wriggler worms to produce vermicast has good potential for the production of organic fertilizer.

Substrates. The substrates, or media where the red wriggler worms exist, were ubiquitous in the community. We applied several substrates in the vermi beds in our several substrate treatments. We used substrates such as manure of livestock including dry cow dung; decomposed and partially decomposed plant wastes collected from garden plants of campus; and vermicast containing red wrigglers.

Manures of the cow contribute to the fertility of the soil by adding organic matter and nutrients, such as nitrogen, that are trapped by bacteria in the soil.

CONCLUSIONS

The Vermiculture and Vermicomposting activity is such a worthwhile and exciting venture. We have learned a lot specifically in the methodologies, benefits and significance of this activity. After almost three months, project delivery and execution, we can therefore conclude that:

1. Vermiculture is a substantial way of reducing wastes, producing fertilizers and maintaining the balance of the ecological environment;

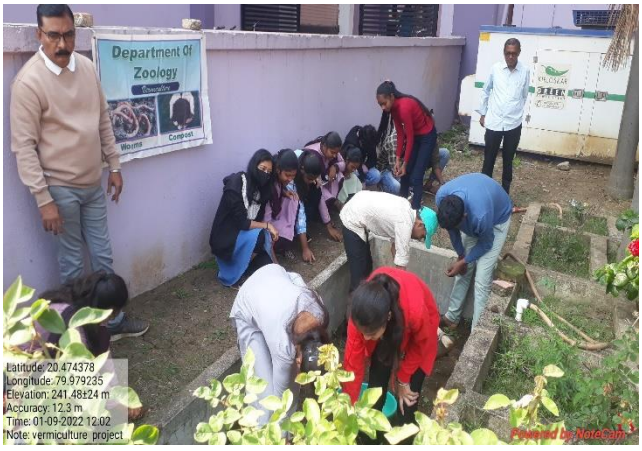
2. Vermicomposting can produce high-quality fertilizers which are better compared to other commercial fertilizers in the market;

3. Vermiculture converts farm wastes into organic fertilizer, making it an environment-friendly technology;

4. Vermiculture increases crop yield and lessens dependence on chemical fertilizers thus mitigating climate change;

5. Vermiculture can be made into a livelihood program and become a source of extra income through selling the vermicast and also the vermi worms;

6. Taking worms out of their natural environment and placing them in the vermi beds creates a human responsibility. They are living creatures with their own unique needs, so it is important to create and maintain a healthy habitat for them to do their work. If you supply the right ingredients and care, your worms will thrive and make compost for you.



Use of vermicompost by Botany department: -

Vermicomposting is a low-technology, environmentally-friendly route used to treat organic waste. The resulting vermicompost has been shown to have several positive impacts on plant growth and health. This organic fertilizer is therefore increasingly considered in garden, agriculture and horticulture as a show's potential alternative to inorganic fertilizers.

In current Year Department of Botany use the vermicompost prepared by Zoology Department. Environmentally friendly vermicompost is a valuable resource as a soil fertilizer because it provides large amounts of macro- and micronutrients for plant growth and is a low- cost and substitute to mineral fertilizers. Vermicompost can be described as a compound mixture of earthworm faeces, and microorganisms, which when added as a supplementary to the soil increases plant growth, flowering, fruit production and accelerates the development of plant species and reduce the soil pollution.

Using Vermicompost in Potted plants and Herbal Garden.

1. Mix compost directly in with potting soil.
2. Put a layer of compost on top of the soil in Herbal Garden.

Department of Botany develop the Herbal Garden, plantation of ornamental plant and potted plants are prepared at the college campus and arrange different corner of the college campus withthe aim of improving greenery. Department of Botany and campus beautification committee taking care of it regularly by using vermicompost and spread the message to save trees, save environment and use the environmentally friend fertilizer.

MAHATMA GANDHI ARTS, SCIENCE &
LATE NASARUDDINBHAI PANJWANI COMMERCE COLLEGE
ARMORI Dist. Gadchiroli (M.S.) 441 208
Affiliated to Gondwana University, Gadchiroli
Re-accredited by NAAC 'A' with 3.24 CGPA

DEPARTMENT OF CHEMISTRY

Chemical Waste Report

This report provides an in-depth analysis of the current status of chemical waste management within the Department of Chemistry M. G. College Armori. It highlights the types and quantities of chemical waste generated, assesses the existing disposal practices, and recommends strategies for improvement. Chemical waste is an inevitable byproduct of various industrial processes within our organization. Proper management of chemical waste is crucial to ensure compliance with environmental regulations, reduce environmental impact, and safeguard the health and safety of employees and the community. A detailed inventory of chemical waste generated in the organization has been conducted. The report categorizes the waste into hazardous and non-hazardous types and provides a breakdown of quantities for each. The assessment considers waste from manufacturing processes, laboratory activities, and maintenance operations.

The report evaluates the current methods employed for the disposal of chemical waste. This includes the use of waste treatment facilities, recycling programs, and disposal through licensed waste management services. The effectiveness of these practices in minimizing environmental impact and ensuring regulatory compliance is examined.

The environmental impact of current chemical waste management practices is assessed. This includes an evaluation of potential soil and water contamination, air emissions, and the overall ecological footprint. Recommendations for reducing the environmental impact of chemical waste disposal are provided.

The report addresses the health and safety risks associated with chemical waste generation and disposal. It highlights potential hazards to employees and the surrounding community, emphasizing the importance of implementing measures to mitigate these risks.

Based on the findings, the report provides a set of recommendations to enhance the management of chemical waste within the organization. These recommendations include:

a. Implementation of a comprehensive waste reduction and recycling program.

b. Upgrade and maintenance of waste treatment facilities.

c. Employee training on proper handling and disposal procedures.

d. Regular compliance audits and assessments.

e. Collaboration with certified waste management services.

Head
Dept. of Chemistry
M.G. Arts, Science & Late N.P
Commerce College Armori.

(Dr. N. D. Bansod).

14/07/2023