ABDIMAS
Jurnal Pengabdian kepada Masyarakat
https://journal.unnes.ac.id/journals/abdimas

Development of Rare Plant Nurseries in Support of Conservation of the UNNES Campus Surrounding Area

Nana Kariada Tri Martuti[1], Lina Herlina[1], Ananto Aji[2], Lutfian Nazar[3]

[1]Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang
[2]Faculty of Social and Political Sciences, Universitas Negeri Semarang
[3]Yayasan Akar Banir Indonesia

Abstract
As a conservation-oriented university, UNNES has carried out various activities that support the preservation of nature and the environment. The increasing development of UNNES has led to an increasing diversity of community activities around it, thus potentially creating environmental impacts due to the increasingly massive land conversion for business, housing and entertainment. This condition indirectly affects the existence of flora and fauna in the UNNES Campus environment. To anticipate this condition, UNNES has undertaken various environmental improvement efforts, one of which is by regularly carrying out planting programs. It is fitting that UNNES has its own nursery in collaboration with the fostered community partners. The Akar Banir Foundation as a partner in community service activities, is a foundation that already has good capabilities in cultivating various types of plants. The objectives of this community service activity are: a) to facilitate a shaded house for a representative rare plant nursery and b) to develop and increase the biodiversity of rare plant seeds that will be developed by Akar Banir. From this community service activity, the following results have been achieved: a shaded house for a rare plant nursery located at Ecofarm UNNES Semarang with an area of 3 x 12 m^2 . This shade house provides a facility for developing rare plant seedlings, which is expected to contribute to preserving Indonesia's rare plant germplasm. To date, 21 rare Indonesian plant species have been developed, and the hope is that this will continue to grow.

Keywords: Rare plants, Conservation, Campus area, UNNES

INTRODUCTION

Since declaring itself as a Conservation University in 2010, UNNES has carried out various activities that support the preservation of nature and the environment. The declaration of UNNES as a “Conservation University” was carried out by considering the university’s role as an academic institution tasked with conducting studies, research, and disseminating science and technology, feeling called and responsible for preserving the environment (Rahayuningsih & Abdullah, 2012). As a conservation-minded university, UNNES is committed to upholding the principles of protection, preservation, and sustainable use of the nation’s natural resources and noble culture. This is not far from the concept of sustainable development applied to the campus environment (Phramesti & Yuliastuti 2013; Wiryono, 2013).

Through this declaration, UNNES expressed its commitment and commitment to becoming a university capable of developing science and technology in harmony with the spirit of environmental conservation. This statement and commitment were confirmed through Rector's Regulation Number 22 of 2009, with a commitment to becoming a "Conservation University" that in the long term will always accommodate the preservation of natural resources and the environment both on and off campus. UNNES is determined to uphold the principles of protection, preservation, utilization, and sustainable development of the nation's natural resources and noble culture.

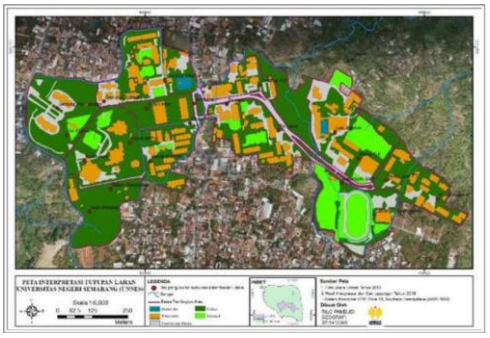

Figure 1. Land cover map of the UNNES Sekaran Campus 2018 (Pambudi et al., 2018)

The development of the UNNES campus and the surrounding campus area in Sekaran certainly requires serious attention in providing green open space and built-up areas. This condition certainly affects environmental conditions, which in turn affect the existence of flora and fauna in the UNNES campus environment. To prevent further damage, UNNES has undertaken various environmental improvement efforts, one of which is by regularly conducting planting programs carried out by new students. Each year, approximately 11,000 new students plant various plants that have been coordinated by the Conservation Sub-Directorate. With the increasing number of plant needs, of course, there is also a need for predetermined plant seeds. So far, seeds have been obtained through collaboration between various parties, namely PT. Djarum, BPDAS, DLHK and others.

As this planting program continues to grow, it is fitting that UNNES establish its own nursery in collaboration with community partners. One such partner that has successfully cultivated plants native to Mount Ungaran, which provide excellent environmental services, is the Akar Banir Foundation. Together with the Handarbeni environmental group in Ngesrepbalong Village, the Foundation manages the nursery in Gunungsari Hamlet. Furthermore, the "Akar Banir Foundation" has become a partner in this community service program.

The Akar Banir Foundation is an environmental group comprised of UNNES alumni from various departments. Established on April 21, 2021, Akar Banir has 11 members and is located at Green Village Housing Complex No. 63, Ngijo Village, Gunungpati District, Semarang. The Akar Banir Foundation has collaborated extensively with and assisted UNNES lecturers and students in environmental programs, conducting research, community service, and environmental activities. Akar Banir has also assisted the Handarbeni Group in cultivating various rare plants with significant environmental benefits, such as Ficus, Gayam, Puspa, Nogosari, Lerak, and coffee plants, which have high economic value.

So far, Akar Banir's nursery activities have only assisted environmental groups. It does not yet have a sheltered house that can be used as a "seed bank," which can be used as material in the development and cultivation of rare plant seeds or plants needed for environmental improvement. Furthermore, the types of seeds cultivated are still limited to seeds that are easily obtained from nature, such as banyan and gayam. For other types, there is no access to the necessary seeds other than those two types. Therefore, it is necessary to support Akar Banir in developing rare plant seeds that have important potential for environmental improvement. Seeds needed for development include: puspa, nogosari, soapberry, various types of bamboo, and other types.

This community service activity is carried out as a form of UNNES's concern for improving the campus environment, as well as supporting UNNES's vision and mission as an environmentally conscious Conservation Campus. The existence of this nursery is also part of maintaining the germplasm of plants that have good environmental functions, and are very rarely found in nature. In addition, this community service activity also supports the UNNES IKU program for IKU 2, 3 and 5. The community service activity also collaborates with the Akar Banir Foundation which also involves many UNNES alumni to be involved in the activity. The community service activity also supports the SDGs Goal 4 (Quality Education), 13 (Climate Change Management), 15 (Terrestrial Ecosystems) and 17 (Partnerships to Achieve Goals). The objectives of this community service activity are: a). the absence of a representative nursery, in the form of a shade house for cultivating rare plants, and b) Development of biodiversity of rare plant seed species.

METHOD

To get the best results, the following describes the steps of the methods and application of science and technology carried out in community service activities.

1. Activity Location and Target

Community empowerment activities were carried out around the UNNES Campus, Sekaran Gunungpati, Semarang City for 8 months with the community service activity partner, the Akar Banir Indonesia Foundation.

2. Implementation Method

Community service activities are carried out in collaboration with the Akar Banir Foundation. These activities utilize several collaborative approaches, including:

a. Group-based, where each community service activity is conducted in collaboration with the Akar Banir Foundation, conducted in a group and programmed manner. The stages of the activity include: outreach, mentoring, and developing a proper and proper nursery for rare plants.
b. Comprehensively, in developing rare plant seedlings, we prioritize both quality and quantity. This is expected to improve the quality of the UNNES campus environment.

In accordance with the objectives of the activity, the methods that will be used in this community service activity will be implemented in 4 (four) stages of activity, namely; (1) Socialization, (2) Competency Improvement; (3) Mentoring; and (4) Monitoring and Evaluation.

The implementation of community service activities is as follows.

a. Socialization or program outreach

This activity aims to increase public knowledge and awareness about perennial plant nurseries and their benefits. The outreach/education activities were conducted in two sessions, covering rare plant nurseries and nursery management.

b. Making a Shade House for Rare Plants

Procurement of a shade house for rare plants measuring 3 x 12 m2, nursery equipment, watering equipment, and materials in the form of fertilizer, planting media, and mulch.

c. Training in developing rare plant seeds

This activity aims to provide knowledge and assistance to partners to understand the characteristics of good and correct growth of rare plant seeds, as well as how to cultivate these rare plants.

d. Nursery Management Training

The training in cultivation techniques aims to improve the knowledge and skills of students and the community around the UNNES campus in cultivating rare plants, which they can then apply in their daily lives. The training also provides training and information on how to obtain rare plants by networking with various competent parties with rare plant collections.

e. Program monitoring and evaluation

After the implementation of each stage of activity, monitoring and evaluation are carried out to determine the performance and sustainability of the program, identify problems or obstacles that arise in the field, and carry out an assessment of the sustainability of the program being carried out.

RESULTS AND DISCUSSION

From the community service activities of the partnership "Development of Rare Plant Nurseries in Supporting Conservation of the Area Surrounding the UNNES Campus" which have been implemented, the following results were obtained:

a. There has been no improvement in representative nursery areas, in the form of greenhouses for rare plant nurseries.

In accordance with the objectives of the community service activities carried out, to obtain rare plant seeds as planned from the beginning, a shade house was needed for the rare plant seeds to be developed. After conducting field observations around the UNNES campus, it was then decided that a shade house for rare plants would be built at the UNNES Ecofarm. A shade house for rare plants is a building structure that functions as a container for plant growth that meets the needs of the plant's growing environment (Pradani, *et al.,* 2023). Over time, the shade house for rare plants can function as a research site that can be adjusted to suit the needs of plant research (Rizkiani, *et al.,* 2021).

In tropical regions, greenhouses are widely used to control temperature, air pressure, and solar energy. In tropical environments, greenhouses can protect plants from excessive rainfall and excessive sunlight. With less extreme ambient temperatures, greenhouses in tropical areas are typically simpler in construction and require relatively few controls (Arifin, 2016; Hadi *et al* ., 2022).

The selection is made based on considerations of the availability of built-up land, the safety of the plants to be developed and the ease of maintenance and supervision in the cultivation of the rare plants being developed.

Figure 2. Initial conditions and construction of the rare plant shade house

The land used to build a shade house for rare plants is located at Ecofarm UNNES which has a land area of ± 3,200 m ^{2} . Ecofarm was chosen to build a shade house for rare plants, because Ecofarm is part of the development of UNNES Campus Conservation which handles the development of various types of plants, both vegetables through hydroponics and organic, ornamental plants and fruits, which have been developed into Edufarm. As stated by Muzaki *et al.,* (2024), the existence of these rare plants is a good educational medium for students and the general public to better recognize the diversity of fruit tree species, especially native and rare species of Indonesia.

The rare plant shade house measures 3 x 12 meters, allowing it to accommodate up to 1,000 rare plants of various species. It is hoped that this shade house will maintain the plants' microclimate during maintenance, allowing them to thrive and, hopefully, to reproduce in the future.

b. Development of biodiversity of rare plant seeds

This community service activity for the development of rare plants is a collaboration between UNNES and the Akar Banir Foundation, in accordance with one of UNNES's Visions as a Conservation-Oriented Campus. As defined by conservation, efforts are needed to protect and preserve natural resources, both natural and man-made, as well as cultural heritage, so that their sustainability can be maintained and utilized wisely by current and future generations (Mu'tashim & Trimurtini, 2024).

The existence of this community service program is expected to enhance UNNES's reputation in conservation. This diversity adds to the plant collection and is also expected to be part of preserving the germplasm of various native Indonesian plant species. As stated by Widyatmoko (2019), Indonesia has a very high level of plant endemism. This is based on its very unique geographical position (between two continents and two oceans) with a constellation of large and small islands stretching from the Oriental region, Wallacea, to Australia, thus giving Indonesia a very high biodiversity and endemism, which requires an appropriate conservation strategy.

To date, 21 rare plant seedlings have been developed at the UNNES Ecofarm shade house, and the team hopes to continue cultivating these rare plant species in the future. The 21 species already cultivated are shown in Table 1.

Table 1. Types of rare plants developed at Ecofarm UNNES

No	Type Name	Local Name	Family	Amount
1	Mesua ferrea	Nagasari	Callophyllaceae	4
2	Syzygium polycephalum	Gowok	Myrtaceae	3
3	Sapindus rarak	Soap nuts	Sapindaceae	1
4	Pachira aquatica	Pachira	Malvaceae	2
5	Dacrycarpus imbricatus	Pine moss	Podocarpaceae	4
6	Syzygium antiseptic	Nogosari / Copper Mine	Myrtaceae	40
7	Inocarpus fagifer	Gayam	Fabaceae	3
8	Eugenia uniflora	Dewandaru	Myrtaceae	4
9	Melicope triphylla	Trempayang	Rutaceae	4
10	Stelechocarpus burahol	Kepel	Annonaceae	2
11	Alangium chinese	Ki jambe	Cornaceae	2
12	Schima wallichii	Flower	Theaceae	1
13	Beilschmiedia sp	Wuru flower	Lauraceae	17
14	Canarium littorale	Canary	Burseraceae	3
15	Helicia attenuata	Jebugan	Proteace	5
16	Kopsia arborea	Pronojiwo / Tali jiwo	Apocynaceae	5
17	Neolithsea triplinervia	Peanut riot	Lauraceae	2
18	Litsea sp	Kemplong	Lauraceae	29
19	Pangium education	Kluwek	Achariaceae	2
20	Eriobotrya japonica	Biwa	Rosaceae	8
21	Lagerstroemia speciosa	Bungur	Lythraceae	17
Amount				158

Some seeds plant rare which collected said, is results nursery Group Handarbeni neighborhood, Ngresepbalong Village, Limbangan Kendal, which is partners fostered by UNNES, PT. PLN Indonesia Power PGU Semarang and the Akar Banir Foundation . Handarbeni develop collection plant original Mount Ungaran, which has been This developed in Gunungsari Ngesrepbalong Hamlet. Plants originate from original Mount Ungaran, which is next seeded at home shade managed by Handarbeni and the Akar Banir foundation, with funding for PT PLN Indonesia Power PGU. Besides plant from Mountain Ungaran, seeds are also obtained various agency government and also seedlings Alone .

Figure 3. Ungaran Mountain Forest plant nursery in Ngesrepbalong Village, a partner of UNNE-PT PLN IP Semarang PGU - Akar Banir

Besides serving as a conservation tool, the shaded house for rare plants at the UNNES Ecofarm also serves as an internal learning tool for both students and lecturers. The Ecofarm, with its shaded house, also serves as a learning tool for various parties outside UNNES, including teachers, students, the community, and various agencies. The presence of rare plants serves as a learning tool for introducing rare plants native to Indonesia and also provides material on local wisdom regarding the existence of these rare plants. The presence of a shaded house (Greenhouse) can protect plants from pests and plant diseases that come from outside without blocking the entry of light (Setiawan, *et al.,* 2020). This condition is complemented by the presence of a good arrangement of plants based on their types, which can add an element of beauty, so that it can be used as a new tourist attraction (Abdurahman, *et al.,* 2022).

Figure 4. Visit to the shade house of rare plants at Ecofarm UNNES

CONCLUSION

From the community service partnership activities that have been carried out, the following conclusions can be drawn:

1. Shaded nursery for rare plants has been established at the Ecofarm UNNES Semarang . This shaded nursery serves as a facility for developing rare plant seedlings, which is expected to contribute to preserving the germplasm of rare plants in Indonesia.
2. To date, 21 rare Indonesian plant species have been developed. It is hoped that the biodiversity of these rare plant seeds will increase in the future, serving as a reference for conservation and education for the entire community.

ACKNOWLEDGEMENT

The partnership community service activity entitled “Development of Rare Plant Nurseries in Supporting Conservation of the UNNES Campus Surrounding Area” is a community service funding from the 2025 DPA Fund Contract Number: PKM Partnership 629.14.3/UN37/PPK.11/2025. Therefore, the author would like to thank LPPM UNNES for funding this community service activity, so that it can be completed well and smoothly.

REFERENCES

Abdurahman,S ., Ningtyas,A.A ., Raulima ,A., Airiyani ,ML, Nasir,MY, Syarifudin,M., & Nugraha ,MIA 2022. Cultivation Plant Horticulture with the Greenhouse Method . Proceedings of the 10th National Seminar on Suboptimal Land in 2022, Palembang, October 27, 2022 *" Revitalization Plant and Animal Food Sources Post-pandemic in Support Suboptimal Land Agriculture in a way Sustainable "* Editor: Siti Herlinda *et. al.* ISSN: 2963-6051 (print) Publisher : Sriwijaya University (UNSRI) Publishing & Printing : 283-292.

Arifin, R. (2016). Hydroponic *Business a la Roni Kebun Sayur* . Jakarta: AgroMedia Pustaka.

Hadi, A. & Mariana, S. (2022). Making Green Houses as a Medium for Education and Village Entrepreneurship Based on the Environment, *KREASI: Journal of Innovation and Community Service,* 2(3): 457-466.

Mu'tashim, RA & Trimurtini. (2024). The Role of Conservation Natural Resources for Sustainable Development Goals (SDGs) Clean Water and Adequate Sanitation, *Journal Indonesian Education Research,* 1(3): 378-384.

Muzaki1, FK, Cahyono, E., Prastitianti, D., & Tawakkal, RI (2024). Tree Garden Rare Fruit : Campaign Conservation of Native Indonesian Plants in Tambak Village Kalisogo, Jabon, Sidoarjo .

SEWAGATI: Journal Devotion To Society, 8(2): 1318-1325.
Pambudi, R; Sanjoto, TB; & Aji, A. (2018). Distribution Study Land Cover and Temperature Humidity Index (THI) Values of Semarang State University (UNNES) Campus, *Geo Image,* 7(2): 111-122.
Phramesti1, R & Yuliastuti, N. (2013). Sustainability Study of Semarang State University (UNNES) as a Conservation Campus (Case Study: UNNES Sekaran, Semarang), *Jurnal Teknik PWK,* 2(1): 183-190.
Pradani, ER, Zamzami, M, Herasmara, R., Abidin, Z., & Muntohir, A. (2023). Initiation of Seed House Development as an Effort to Ensure Food Security in Sumbertempur Village, Wonosari District, Malang Regency, *Community Service Journal,* 3(2): 532-539.
Rahayuningsih, M & Abdullah, M. (2012). Distribution and Diversity of Herpetofauna in Supporting Biodiversity Conservation at the Sekaran Campus of Semarang State University, *Indonesian Journal of Conservation,* 1(1): 1-10.
Rizkiani, DN, Sumadyo, A., & Marlina, A. (2020). Greenhouse as a Horticultural Research Container at the Food Crops Research and Development Center in Pemalang, *Senthong Journal,* 3(2): 461-470.
Setiawan, R., Ulfa, H., Miftahuljannah, Ajza, D., Setiawan, B. (2020), *Jurnal Lepa-lepa Open,* 1(3): 480-487.
Widyatmoko, D. (2019). Indonesian Plant Conservation Strategies and Innovations for Sustainable Utilization, *4th National Seminar on Biology and Science Education (SNPBS) 2019* : 1-21.
Wiryono, W. (2013). *Introduction to Environmental Science 1st ed.* Bengkulu: Pertelon Media.