



# **MS HORTICULTURE**

## **AREA III**

**Graduate School, University of Southern  
Mindanao**

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## **EXTENSION**

Extension is one of the four-fold functions of the University of Southern Mindanao (USM), alongside instruction, research, and agro-industrial production. It serves as a vital mechanism for translating the knowledge, technologies, innovations, and research outputs generated within the University into practical applications that respond to the needs of farming communities and other stakeholders. While instruction develops competent professionals and research generates new knowledge and technologies, extension provides the essential link that brings these outputs beyond the university and into the communities where they can create meaningful and sustainable impacts. In this regard, extension is not merely an auxiliary activity but an integral component of the University's mandate to contribute to agricultural development, food security, livelihood improvement, and socioeconomic transformation in Mindanao.

In the context of agricultural development, extension and outreach have long been recognized as important mechanisms for strengthening the capacity of farmers, agricultural workers, entrepreneurs, community organizations, and other rural stakeholders. Various extension models have been implemented worldwide to address the diverse needs and circumstances of farming communities (Kumar et al., 2019; Antholt, 1998; Torimiro & Igodan, 2019). Contemporary approaches to extension have evolved from the traditional one-way transfer of technology toward more participatory, demand-driven, community-based, and knowledge-sharing approaches. These models recognize farmers and community members not simply as recipients of technologies but as active partners in identifying problems, developing solutions, adapting innovations, and evaluating their applicability under local conditions. Increasingly, agricultural extension also encompasses broader dimensions of community well-being, including health, mental health, youth development, entrepreneurship, environmental sustainability, and social empowerment. Such approaches benefit from the longstanding relationships, trust, local knowledge, and community-based networks established between extension providers and their clientele (Dwyer et al., 2017).

Consistent with this broader perspective, the University of Southern Mindanao envisions a developed and progressive Mindanao supported by a strong combination of trained and competent human resources, appropriate and modern technologies, adequate financial support, quality education, and capable development workers and service providers. This vision recognizes that sustainable agricultural and rural development cannot be achieved through technology alone. It requires the convergence of knowledge, skills, resources, institutional support, and active participation of the communities being served. Thus, USM continuously endeavors to strengthen its extension programs by connecting its academic expertise, research capabilities, and technological resources with the actual needs and development priorities of its service areas.

The University's extension mission focuses on the facilitation of technology transfer and the dissemination of useful information, knowledge, and innovations generated, developed, validated, and adopted by USM. Through its extension initiatives, the

University seeks to ensure that research-based technologies are translated into practical and accessible interventions that can be adopted by farmers, rural communities, agricultural practitioners, entrepreneurs, local government units, people's organizations, and other stakeholders. These efforts are directed toward improving production efficiency, increasing productivity and income, strengthening livelihood opportunities, promoting sustainable agricultural practices, and enhancing the overall socioeconomic well-being of its clientele, particularly those belonging to marginalized, disadvantaged, and underserved communities within the University's service regions.

The College of Agriculture and its academic programs, including the MS Horticulture program, contribute significantly to the University's extension mandate. Faculty members, researchers, graduate students, and other academic personnel actively participate in extension activities that bring horticultural knowledge and technologies closer to farmers and communities. These activities may include technology demonstrations, training programs, technical lectures, farmer field activities, production seminars, hands-on skills training, distribution and promotion of appropriate planting materials, and dissemination of research-based information on crop production and management. Through these interventions, the University helps strengthen the technical capacity of its clientele in areas such as fruit and vegetable production, nursery management, crop propagation, postharvest handling, organic and sustainable production, pest and disease management, and other relevant horticultural technologies.

Extension activities also provide an important avenue for field validation and feedback generation. Technologies developed through research may perform differently depending on environmental conditions, available resources, farmer practices, and socioeconomic circumstances. By bringing research outputs into actual production environments, extension activities enable faculty and researchers to determine how technologies perform under real-world conditions. At the same time, farmers and other stakeholders provide valuable feedback regarding the practicality, affordability, acceptability, and adaptability of these technologies. This two-way interaction strengthens the University's research and instruction functions because community-based experiences and emerging agricultural problems can be integrated into future research initiatives, classroom discussions, training materials, and graduate research.

Furthermore, extension serves as a platform for promoting sustainable and climate-responsive agriculture. With the increasing challenges posed by climate variability, environmental degradation, rising production costs, declining soil quality, emerging pests and diseases, and changing market conditions, farmers require technologies and management practices that are not only productive but also economically viable and environmentally responsible. USM's extension efforts therefore have the potential to promote resource-efficient production systems, organic and bio-based inputs, waste utilization, climate-smart agricultural practices, improved postharvest management, and other technologies that contribute to resilient agricultural communities.

The University's extension mandate also extends beyond the direct transfer of production technologies. It promotes capacity building, entrepreneurship, livelihood development, and community empowerment. Training and technical assistance can equip beneficiaries with knowledge and skills that enable them to establish or improve agricultural enterprises, process and add value to agricultural products, reduce production losses, and identify opportunities within local and regional markets. In this way, extension contributes not only to increased agricultural productivity but also to employment generation, household income improvement, food and nutrition security, and the strengthening of local economies.

In the implementation of its extension programs, USM recognizes the importance of partnership and collaboration. Meaningful and sustainable extension outcomes are strengthened through linkages with national government agencies, local government units, research institutions, private organizations, farmer groups, people's organizations, cooperatives, and other development partners. Such partnerships facilitate the mobilization of technical expertise, financial resources, facilities, technologies, and networks necessary for effective program implementation. They also expand the reach of the University's extension services and enable the institution to respond more effectively to emerging development needs in its service communities.

Ultimately, extension at the University of Southern Mindanao is anchored on the principle that knowledge becomes more valuable when it is transformed into meaningful action and community impact. Through the integration of instruction, research, extension, and agro-industrial production, the University fulfills its role as a catalyst for agricultural and rural development in Mindanao. Its extension programs provide a continuing bridge between the academic community and its stakeholders, ensuring that relevant knowledge, technologies, and innovations reach the people who need them most. Through sustained engagement with farmers, communities, industry partners, government agencies, and other stakeholders, USM contributes to the development of more productive, resilient, sustainable, and empowered agricultural communities, ultimately advancing its vision of a developed and progressive Mindanao.

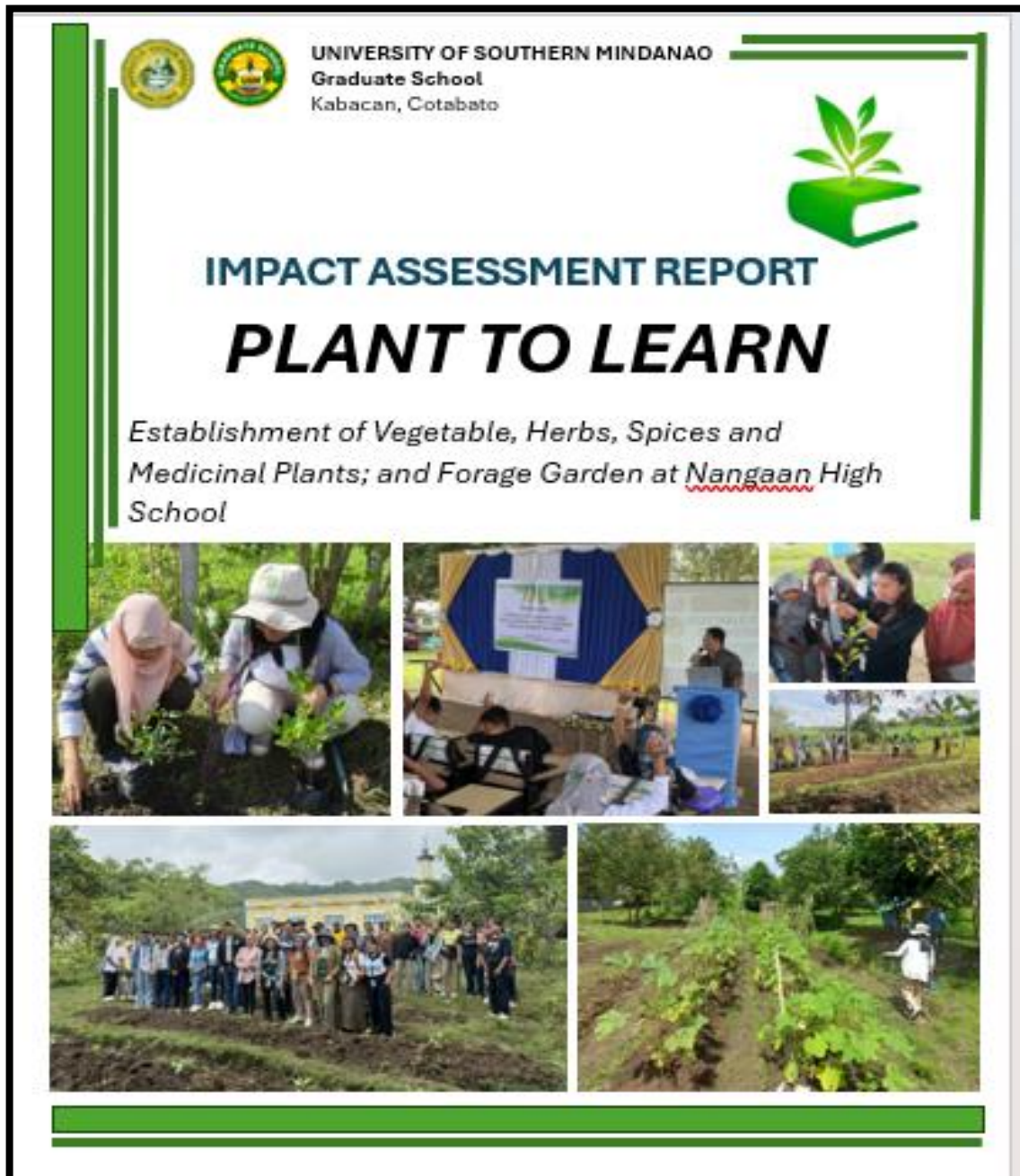
## **THE INSTITUTION'S APPROVED EXTENSION AGENDA**

Extension efforts of the University of Southern Mindanao conform to an integrated sustainable development program termed UniK (Unibersidad at Komunidad), the university's response to Southern Mindanao communities to build their capacity to address opportunities and challenges. It makes use of a holistic approach integrating all extension programs and services of the different colleges/units in the university into one basket of services that:

- Grow and strengthen families and community leadership;
- Build strong ties in and between communities;
- Build and grow tourism initiatives;
- Encourage the use of Internet technology;
- Enhance economic opportunities for agricultural enterprises;
- Recognizes best practices in environmental protection and agriculture;
- Ensure nutrition, health and food safety; and
- Provide appropriate rural infrastructure support for empowerment towards community development.

### 3.1. IMPACT OF EXTENSION PROJECT

#### PLANT TO LEARN: Establishment of Vegetable, Herbs, Spices and Medicinal Plants; and Forage Garden at Nangaan High School



Plant to Learn Extension Project Report

- **Executive Summary of Extension Project: Plant to Learn**

The MS Horticulture Program of the University of Southern Mindanao (USM) has demonstrated its significant contribution to community development through its active involvement in the extension project for the Gulayan sa Paaralan at Nangaan High School, Kabacan, Cotabato. The project is aligned with the Department of Education's Gulayan sa Paaralan Program (GPP) and its broader objectives of promoting food production, environmental sustainability, health and nutrition, experiential learning, and livelihood development among school communities. It also complements the University's mandate to translate its expertise, research outputs, and technological innovations into practical interventions that benefit communities.

Nangaan High School, located in the western part of Kabacan, Cotabato, serves learners from Grades 7 to 10 and has previously benefited from USM's extension initiatives. In 2019, the school became a recipient of the Establishment of Arboretum Project, through which indigenous fruit trees were planted within the school premises. The established fruit trees have since matured and started bearing fruits, providing a tangible and continuing contribution to the school's greening efforts and supporting the objectives of the National Greening Program. Building on this earlier intervention, the College of Agriculture, in partnership with the Graduate School programs, particularly the MS Horticulture Program, expanded its extension engagement with the school through the development of a more comprehensive school-based agricultural learning area.

The MS Horticulture Program played an important role in providing technical expertise in horticultural crop production, garden establishment, plant propagation, nursery management, crop selection, and sustainable crop management. Its involvement strengthened the technical foundation of the project and ensured that the proposed garden components were appropriate for the school's available resources, environmental conditions, and educational objectives. The program's participation exemplifies how graduate education in horticulture extends beyond classroom instruction and research laboratories by addressing actual community needs through knowledge transfer, technical assistance, and capacity building.

A significant component of the extension initiative was the proposed development of the Gulayan sa Paaralan, complemented by the establishment of a forage germplasm garden and other horticultural learning components. These interventions were conceptualized in response to the concerns, needs, and opportunities identified during the Focus Group Discussion (FGD) conducted with the school. The participatory approach allowed the College of Agriculture and its graduate programs to identify the school's existing resources, anticipated challenges, priority needs, and possible counterpart contributions. The MS Horticulture Program contributed its specialized knowledge in determining appropriate vegetable crops, medicinal plants, herbs, spices, and other useful plant

species that could be incorporated into the school garden and utilized as educational resources.

The project's contribution goes beyond the physical establishment of a vegetable garden. Through the technical involvement of the MS Horticulture Program, the garden was envisioned as a living laboratory and learning site where students could acquire practical knowledge through direct participation in crop production activities. The learning-by-doing approach allows students to experience the different stages of horticultural production—from land preparation and seed selection to propagation, planting, crop maintenance, harvesting, and utilization. This experiential learning strategy provides an effective complement to classroom instruction because students are able to observe actual plant growth, identify production challenges, make decisions, and directly assess the results of their interventions.

The MS Horticulture Program also contributed to the project's objective of promoting food and nutrition security. The establishment of vegetable gardens provides an opportunity for the school to produce nutritious crops that can supplement school-based feeding activities. Vegetables and other edible plants can provide important sources of vitamins, minerals, protein, and other nutrients needed by growing children. By introducing students to the production of their own food, the project encourages healthy eating habits while demonstrating the practical relationship between agriculture, nutrition, and human well-being.

Another important contribution of the program is the promotion of sustainable and environmentally responsible horticultural practices. The integration of vegetable production, medicinal plants, herbs, spices, forage species, and tree components increases plant diversity within the school environment. The project also provides opportunities to introduce students and teachers to sustainable practices such as composting, recycling of biodegradable materials, proper garden management, soil improvement, and efficient utilization of available resources. These practices help transform the school grounds into a productive green space while developing environmental awareness among learners.

The establishment of the forage germplasm garden further expands the educational and agricultural value of the project. It provides a venue for the conservation, demonstration, and evaluation of forage materials that may be useful for livestock production and future agricultural activities. The inclusion of this component demonstrates the interdisciplinary nature of the MS Horticulture Program's contribution, connecting horticultural knowledge with broader agricultural production systems. It also creates opportunities for future learning activities involving plant biodiversity, propagation, forage management, and sustainable livestock-feed production.

Capacity building was another major contribution of the MS Horticulture Program. Through extension activities, technical guidance, and networking assistance, faculty members and graduate students were able to share relevant horticultural knowledge with

teachers, learners, and other school stakeholders. The project provides opportunities for training on basic crop production, plant propagation, nursery management, garden maintenance, pest management, harvesting, and other horticultural practices. Such capacity-building activities help ensure that the school community develops the skills necessary to sustain the garden beyond the initial implementation of the project.

The MS Horticulture Program's involvement also strengthened the linkage between instruction, research, and extension. Knowledge and technologies developed through graduate education and horticultural research can be translated into practical technologies appropriate for school and community settings. At the same time, field experiences gained through the extension project can provide valuable insights into emerging problems and community needs that may be addressed through future research and student theses. This creates a continuing cycle in which research generates technologies, extension facilitates their application, and community feedback contributes to further improvement and innovation.

Importantly, the project positions Nangaan High School as a potential learning site and demonstration area for sustainable agriculture and horticulture. Such a site can serve not only the immediate school community but also potentially become a venue for future training, demonstration activities, student immersion, research, and extension activities of USM. The garden and forage germplasm area can provide a visible demonstration of how limited school spaces can be transformed into productive, educational, and environmentally beneficial areas.

The extension project likewise contributes to student development and values formation. Active participation in gardening activities can foster responsibility, discipline, teamwork, patience, environmental stewardship, and appreciation for agriculture. Rather than viewing agriculture merely as a theoretical subject, students are given the opportunity to experience it as a practical, productive, and potentially rewarding livelihood. Such exposure may also encourage young people to develop greater interest in agriculture and horticulture and recognize the important role of these fields in food security, environmental conservation, and rural development.

From a broader community perspective, the project contributes to livelihood awareness and self-sufficiency. Students who acquire basic horticultural skills can potentially apply these technologies in their homes and communities. Knowledge of vegetable production, medicinal plant cultivation, nursery establishment, composting, and other gardening practices can be transferred to household gardens and community spaces. In this way, the impact of the extension project has the potential to extend beyond the school premises and reach families and neighboring communities.

The contribution of the MS Horticulture Program to the Nangaan High School extension project demonstrates the relevance and responsiveness of graduate education to community development. Through its specialized expertise in horticulture, the program helped transform the concept of a school garden into a multifunctional educational,

nutritional, environmental, and agricultural development initiative. Its involvement strengthened the technical components of the project, supported capacity building, promoted sustainable horticultural practices, enhanced experiential learning, and established opportunities for continued research, extension, and community engagement.

The project therefore serves as a concrete manifestation of the University's commitment to its four-fold functions of instruction, research, extension, and agro-industrial production. More specifically, it demonstrates how the MS Horticulture Program utilizes graduate-level expertise to respond to real community needs and convert academic knowledge into practical benefits. Through the Gulayan sa Paaralan, forage germplasm garden, and related learning activities, the program contributes to developing environmentally conscious, agriculturally knowledgeable, and self-reliant young learners while strengthening the capacity of the school to become a sustainable learning site.

Ultimately, the extension initiative reflects the MS Horticulture Program's commitment to "learning through doing, research through application, and service through technology transfer." By bringing horticultural knowledge and expertise directly to the school community, the program contributes not only to the physical greening and productivity of the school but also to the development of students' knowledge, skills, attitudes, and appreciation of agriculture. The project stands as a significant example of how the MS Horticulture Program can create sustainable, community-responsive, and education-centered extension impacts that support food security, environmental sustainability, livelihood development, and the broader goal of building progressive and resilient communities in Mindanao.

## **PLANT TO LEARN: PROJECT RATIONALE AND OBJECTIVES**

The **National Greening Program (NGP)** was declared a government priority through **Executive Order (EO) No. 26, series of 2011**, signed by former President Benigno S. Aquino III in February 2011. As a flagship environmental and development program of the Philippine government, the NGP was established to address interconnected concerns related to **food security, poverty reduction, biodiversity conservation, and climate change mitigation and adaptation**. The program recognizes the important role of agroforestry and sustainable land management in addressing environmental degradation while simultaneously creating livelihood opportunities for rural communities. Through the integration of trees, crops, and other productive plant species, agroforestry systems can help reduce soil erosion and surface runoff, improve soil and environmental conditions, contribute to carbon sequestration, and strengthen the resilience of communities to climate-related challenges. At the same time, productive agroforestry and agricultural enterprises can provide additional sources of food, livelihood, and income for Filipino families.

In support of the objectives of the NGP, the **Department of Education (DepEd)** institutionalized the integration of **Gulayan sa Paaralan, solid waste management, and tree planting** through **DepEd Order No. 5, s. 2014**. The initiative promotes the establishment and development of productive and environmentally sustainable school gardens as learning spaces and sources of nutritious food. School gardens have become increasingly relevant in addressing concerns related to **malnutrition, food security, environmental awareness, and practical education**. Through direct participation in gardening activities, students are introduced to the production of vegetables, fruits, medicinal plants, herbs, and other useful crops while developing an appreciation for healthy food choices and sustainable agricultural practices.

The establishment of school gardens also provides an effective platform for **experiential and contextualized learning**. Instead of limiting agricultural concepts to classroom discussions, students are given opportunities to observe plant growth, participate in propagation and crop production, manage garden resources, and experience the outcomes of their decisions. This hands-on approach can strengthen students' knowledge and skills while developing important values such as responsibility, teamwork, patience, environmental stewardship, and appreciation for agriculture. The produce generated from school gardens may also contribute to school-based feeding initiatives and improve access to nutritious food.

Beyond the school setting, gardening knowledge and skills can be transferred to students' homes and communities. Vegetable production, plant propagation, composting, nursery management, and other simple technologies can be adopted as **household food-production and livelihood activities**. Such practices can potentially reduce household expenditures for vegetables and other food products while providing opportunities for small-scale income generation. In this manner, school gardening becomes more than an educational activity; it becomes a practical mechanism for strengthening household food security, livelihood awareness, environmental responsibility, and community resilience.

It was within this context that the **“Plant to Learn” Project** was conceptualized through the collaborative efforts of the **College of Agriculture, the Graduate School–MS Horticulture Program, and the Southern Philippines Agriculture, Aquatic and Natural Resources Research and Development Consortium (SOXAARDEC)**. The project represents a convergence of academic expertise, research-based technologies, extension services, and community engagement aimed at providing holistic and sustainable interventions to the students and teachers of **Nangaan High School, Nangaan, Kabacan, Cotabato**.

The project is anchored on the principle that **students learn more effectively when they are given opportunities to apply knowledge in real-life situations**. Thus, Plant to Learn seeks to transform portions of the school environment into productive learning spaces where students and teachers can acquire practical knowledge in horticulture, gardening, plant propagation, crop and forage production, environmental management, and livelihood development. The project also recognizes that education, health, food

security, livelihood, and environmental sustainability are interconnected aspects of community development and therefore require an integrated approach.

A significant feature of Plant to Learn is its emphasis on **capacity building**. Through appropriate training, demonstrations, technical lectures, and hands-on activities, the project seeks to enhance the competencies of teachers and students in establishing and maintaining productive gardens. The technical interventions may cover basic landscape gardening, site preparation, selection of appropriate crops, seed and planting-material preparation, vegetable production, plant propagation, nursery management, garden maintenance, composting, and sustainable crop management. Through these activities, the MS Horticulture and related agricultural programs can translate academic and research expertise into practical technologies that are accessible and applicable to the school community.

The project likewise incorporates **livelihood and entrepreneurship education** to help students understand the economic potential of agriculture and horticulture. Beyond producing food for household or school consumption, learners may be introduced to basic concepts of enterprise development, product utilization, value addition, simple marketing, and resource management. These experiences can help develop an entrepreneurial mindset and demonstrate that agriculture can provide viable livelihood opportunities when supported by appropriate technologies, skills, and market-oriented approaches.

Another important dimension of Plant to Learn is its contribution to **environmental sustainability**. The integration of vegetable gardens, landscape plants, trees, medicinal plants, herbs, spices, and forage species increases plant diversity within the school environment and provides opportunities to demonstrate environmentally responsible practices. The project can incorporate activities such as composting, proper waste segregation and utilization, organic input preparation, water conservation, and responsible management of garden resources. These interventions contribute to the creation of a greener and healthier school environment while allowing students to understand the relationship between agricultural practices, environmental quality, and climate change.

The project also recognizes the importance of **health and well-being** as an integral component of holistic education. Access to fresh and nutritious vegetables can complement school nutrition initiatives, while gardening activities encourage students to develop healthier food preferences and an appreciation for locally produced food. Where appropriate, the project may also facilitate linkages for basic health-related services and health education, thereby complementing its agricultural and educational interventions. This integrated approach reinforces the understanding that a productive school environment can contribute simultaneously to students' physical well-being, learning, and personal development.

Plant to Learn is designed primarily to benefit the students and teachers of Nangaan High School; however, its potential impact extends beyond the immediate beneficiaries. The

knowledge and skills acquired by participants can be transferred to their **families, households, and surrounding communities**. Students can apply simple gardening and plant propagation techniques at home, while teachers can integrate gardening activities into classroom instruction and school programs. Consequently, the school can serve as a center for the dissemination of practical agricultural knowledge and potentially become a **demonstration and learning site** for other schools and community stakeholders in the area.

The project further strengthens the University's **four-fold mandate of instruction, research, extension, and agro-industrial production**. It provides an avenue for faculty members and graduate students to apply their technical expertise in actual community settings, while also generating opportunities to identify field-based problems that may be addressed through future research. Research findings and proven technologies can be adapted for extension purposes, while feedback from students, teachers, and community stakeholders can contribute to the refinement of technologies and future research initiatives. This creates a sustainable linkage among academic knowledge generation, technology development, and community application.

### **Specific Objectives**

In particular, the **Plant to Learn Project** aims to:

1. Provide students and teachers with basic knowledge and practical skills in landscape gardening and school garden establishment, including appropriate site preparation, plant selection, propagation, planting, maintenance, and utilization of available spaces;
2. Develop applicable skills in crop and forage production through demonstrations and hands-on activities involving vegetables, medicinal plants, herbs, spices, forage species, and other appropriate plant materials;
3. Enhance the participants' competencies in vegetable production and plant propagation, enabling them to produce planting materials and nutritious crops that may be used for school consumption, learning activities, and potential livelihood opportunities;
4. Promote food and nutrition security by encouraging the production and utilization of nutritious vegetables and other edible crops within the school environment;
5. Develop students' awareness and skills in agricultural entrepreneurship and livelihood development, particularly through simple, practical, and potentially income-generating horticultural activities;
6. Promote environmental stewardship and sustainable agricultural practices through school gardening, composting, solid waste management, plant diversity, tree planting, and responsible use of natural resources;

7. Strengthen the capacity of teachers and school personnel to sustain the established garden and integrate horticultural and environmental activities into relevant learning areas and school programs;
8. Establish the school as a potential learning and demonstration site for sustainable horticulture, school gardening, plant propagation, forage production, and related agricultural technologies; and
9. Strengthen collaboration among USM's College of Agriculture, Graduate School programs, SOXAARDEC, Nangaan High School, and other stakeholders in implementing sustainable, community-responsive extension initiatives.

**Plant to Learn** seeks to go beyond the physical establishment of a school garden. It envisions the garden as a living classroom, laboratory, livelihood training area, and environmental learning space where students and teachers can acquire knowledge through direct experience. Through the significant contribution of the College of Agriculture and its graduate programs, particularly the expertise in horticulture and crop science, the project transforms agricultural knowledge into practical community-based interventions.

Ultimately, the project embodies the principle that **“students plant not only crops, but also knowledge, skills, values, and opportunities for a better future.”** By integrating education, horticulture, environmental sustainability, health, nutrition, and livelihood development, Plant to Learn contributes to the development of more knowledgeable, skilled, self-reliant, and environmentally responsible learners while strengthening the role of the University of Southern Mindanao as a partner in the sustainable development of communities in Mindanao.

## **Activities of the Extension Project: Plant to Learn Project**

Together with the University Research and Extension Development Center (URDEC), the project leaders and component leaders met in January 2025 for the project inception meeting. During the meeting, the project team discussed the initial implementation plans, project components, roles and responsibilities, and the activities to be undertaken in collaboration with the beneficiary school.

Following the inception meeting, an initial consultation with the Head Teacher of Nangaan High School was conducted to discuss the project objectives, proposed activities, and the school's needs and available resources. This was followed by a site visit and environmental scanning of the proposed project area. The activity enabled the project team to assess the existing site conditions, available spaces, environmental characteristics, and other factors relevant to the implementation of the project.

The site assessment and environmental scanning were validated and evaluated by the Project Leaders, Dr. Monaira Sumael and Dr. Mark Al-jamie J. Muttulani, to ensure that the proposed project interventions were appropriate and responsive to the actual conditions and needs of the beneficiary school.



**Figure 1. Site visit and environmental scanning conducted and validation**



**Figure 2. Existing indigenous fruit tree seedlings established through the previously implemented Arboretum Project at Nangaan High School.**

Following the site assessment and validation, the project team immediately initiated the preparation and processing of the necessary administrative and procurement documents, including the Special Order (SO), Project Procurement Management Plan (PPMP), and Purchase Request (PR).

These documents were prepared to facilitate the timely procurement of the materials, supplies, equipment, and other resources required for the implementation of the project activities. The prompt processing of these requirements ensured that the planned extension interventions could proceed efficiently and in accordance with the University's administrative and procurement policies.



**Figure 3.** Coordination meeting with the **Barangay Kagawad, Nangaan High School Principal, and project component leaders** to discuss project implementation, community participation, and the roles and responsibilities of stakeholders.

### **Implementation (Community Development)**

As part of the community development component of the project, the MS Horticulture Program contributed technical expertise in the selection, preparation, distribution, and establishment of appropriate planting materials. In January 2025, fruit and forage planting materials, including asexually propagated calamansi and pomelo, durian seedlings, and Setaria forage materials, were distributed to the beneficiary community and subsequently planted within the designated project area.

The activity provided an opportunity to demonstrate appropriate horticultural practices, particularly in planting material selection, proper handling and establishment, spacing, site preparation, and early crop management. The inclusion of asexually propagated calamansi and pomelo highlighted the importance of vegetative propagation in maintaining desirable characteristics and facilitating the establishment of productive fruit crops. Likewise, the introduction of durian and Setaria provided additional components for fruit production, biodiversity enhancement, and forage resource development.

Through the participation of the MS Horticulture faculty and project team, the activity served as a practical avenue for technology transfer and hands-on learning among

teachers, students, and community stakeholders. The planting activity not only contributed to the greening and productive utilization of the project site but also strengthened the participants' knowledge and appreciation of sustainable horticultural production. These interventions were intended to support the long-term development of the area as a learning, demonstration, and community-based horticulture site.



**Figure 4. Distribution of pasture grasses and legume seedlings as feed resources for livestock and for the establishment of vegetable, herb, spice, and forage gardens.**

## **PRE-IMPLEMENTATION OF THE PARTNERSHIP PROGRAM**

Partnership between Nangaan High School, Kalilintad, Nangaan, Kabacan, Cotabato, and the University of Southern Mindanao – College of Agriculture and MS Horticulture Program Extension Program Theme: *“Growing Bangsamoro Futures: Resilience and Learning through the Gulayan sa Paaralan Program”*

The pre-implementation phase of the partnership program between Nangaan High School and the University of Southern Mindanao (USM) College of Agriculture, particularly the MS Horticulture Program, focused on establishing coordination, strengthening

institutional linkages, and preparing the necessary resources and mechanisms for the successful implementation of the Gulayan sa Paaralan Program.

The initiative was designed to promote resilience, experiential learning, food and nutrition security, environmental stewardship, and sustainable horticultural practices among students, teachers, and community stakeholders. Through the partnership, the MS Horticulture Program provided technical expertise in vegetable production, plant propagation, garden establishment, landscape development, and sustainable crop management, while Nangaan High School provided the learning environment, community participation, and counterpart support necessary for project implementation.

The partnership embodied the theme “Growing Bangsamoro Futures: Resilience and Learning through the Gulayan sa Paaralan Program,” emphasizing the role of school-based horticulture as a platform for developing practical agricultural skills, strengthening food security, promoting environmental responsibility, and preparing learners to become more resilient and self-reliant members of their communities.



**Figure 5. Distribution of fruit seedlings facilitated by the school principal, teachers, and students of Nangaan High School as part of the establishment and development of the school-based horticultural garden.**



**Figure 6. Hands-on training and demonstration on the proper planting and establishment of fruit seedlings provided to the students and teachers of Nangaan High School within the designated garden areas.**

Upon completion of the pre-implementation activities, site visits and monitoring activities were conducted to ensure the proper maintenance, survival, and recovery of the planting materials. These activities were undertaken to ensure that the established plants could be maintained as sources of new propagules and planting materials for the continuous production of fruit seedlings and other horticultural crops.

The capacity-building component of the project included training on the proper identification of indigenous herbs, spices, and medicinal plants, as well as discussions on the various medicinal uses of commonly found plants in the community. The training also covered the bio-intensive approach to gardening, methods of plant propagation, edible landscaping, and basic forage crop production and management. These activities were designed to enhance the knowledge and practical skills of students and teachers in sustainable horticultural production, plant utilization, propagation, and garden management.

Through these capacity-building activities, the participants gained practical knowledge that could be applied not only within the school garden but also in their homes and communities, thereby promoting food security, environmental stewardship, sustainable agriculture, and potential livelihood opportunities.

These training sessions are composed of knowledge learning and demo skills activities. These sessions were facilitated by the project management team from Department of Crop Science, College of Agriculture, University of Southern Mindanao in partnership with the Graduate School- MS Horticulture Program.



**Figure 7. Dr. Monaira I. Sumael on her learning topic skills  
(Identification of Herbs, Medicinal Plants and Spices)**



**Figure 8. Dr. Mark Al-Jamie J. Muttulani facilitating a learning session on asexual propagation techniques and vegetable production, emphasizing practical skills in plant multiplication and sustainable vegetable growing.**

The training was actively facilitated by the MS Horticulture students, who worked closely with Dr. Mark Al-Jamie J. Muttulani, Program Head of the MS Horticulture Program, and Dr. Monaira I. Sumael, Associate Dean of the College of Agriculture, during the lectures, demonstrations, and hands-on learning sessions. Their active involvement provided the participants with direct guidance and practical experience in vegetable garden establishment, garden design, and various methods of plant propagation.

The hands-on approach transformed the training into a meaningful learning-by-doing experience, allowing participants to move beyond theoretical concepts and directly apply horticultural principles in the field. Through guided demonstrations and actual practice, the participants developed essential competencies in vegetable production, seed and planting-material preparation, vegetative and other plant propagation techniques, proper selection and preparation of forage stem cuttings, and nursery establishment and management.

The participants demonstrated enthusiasm, active engagement, and strong interest throughout the lectures and practical sessions. Their participation reflected an increased appreciation of horticulture as a practical skill that can support food security, environmental sustainability, livelihood development, and community resilience. More importantly, the training equipped the participants with transferable skills that they could apply in the school garden, household gardens, and their communities.

The involvement of MS Horticulture students also provided an important peer-learning and mentorship dimension to the activity. By assisting in demonstrations and guiding participants during hands-on exercises, the graduate students were able to share their technical knowledge while strengthening their own competencies in extension delivery, technology transfer, communication, and community engagement. Thus, the activity created a reciprocal learning environment in which both the beneficiaries and MS Horticulture students gained valuable knowledge and practical experience.

The training strengthened the capacity of Nangaan High School students and teachers to establish and manage productive horticultural areas while demonstrating the significant role of the MS Horticulture Program in translating graduate-level knowledge and expertise into practical, community-responsive extension services.



**Figure 9. MS Horticulture students Ms. Caryl Catipay, Mr. JunFred Escoton, and Ms. Lea Patrimonio facilitating a hands-on demonstration on proper asexual grafting techniques for Senior High School students.**

Ms. Caryl Catipay, Mr. JunFred Escoton, and Ms. Lea Patrimonio, MS Horticulture students, actively facilitated a hands-on demonstration on proper asexual grafting techniques for the Senior High School (SHS) students of Nangaan High School. The activity provided the participants with an opportunity to learn the principles and practical procedures of grafting, including the proper selection of suitable plant materials, preparation of the scion and rootstock, making appropriate grafting cuts, proper alignment of the vascular tissues, securing the graft union, and providing appropriate aftercare to promote successful graft establishment.

The MS Horticulture students demonstrated their technical competence and practical skills in plant propagation by presenting the procedures in a clear, systematic, and learner-centered manner. Rather than limiting the activity to a theoretical discussion, they demonstrated the actual grafting process and guided the SHS students as they practiced the technique. This hands-on approach enabled the participants to gain first-hand experience and develop confidence in applying asexual propagation techniques.

The involvement of the MS Horticulture students significantly strengthened the extension component of the project. Their participation served as an effective mechanism for technology transfer and peer-to-peer learning, allowing specialized horticultural knowledge gained through graduate-level education to be translated into practical skills that could be readily understood and applied by younger learners. Through their direct interaction with the SHS students, they were able to respond to questions, correct techniques, provide immediate feedback, and encourage active participation throughout the demonstration.

The activity also highlighted the importance of asexual propagation in horticultural production. By learning grafting techniques, the participants gained an understanding of how desirable characteristics of selected plants can be maintained and how productive and quality planting materials can be multiplied. These skills can potentially be applied to fruit tree production, nursery establishment, and household gardening, thereby creating opportunities for future food production and livelihood activities.

More importantly, the MS Horticulture students themselves benefited from their involvement as extension facilitators. The activity provided them with an authentic setting to apply their academic knowledge and strengthen their competencies in technical communication, demonstration, mentoring, leadership, problem-solving, and community engagement. Their transition from learners to facilitators demonstrated the practical value of graduate education in preparing future professionals who can effectively communicate and transfer agricultural technologies to communities.

The enthusiasm and participation of the SHS students further contributed to the success of the activity. Through direct observation and hands-on practice, they were able to appreciate that horticulture is not merely a classroom concept but a practical skill with applications in food production, environmental sustainability, and livelihood development.



**Figure 10. Ms. Lea A. Patrimonio, MS Horticulture student and DOST-GREAT Scholar, facilitating a learning session on artificial plant propagation techniques for the students and teachers of Nangaan High School.**

Ms. Lea A. Patrimonio, MS Horticulture student and DOST-GREAT Scholar, facilitated a learning session on artificial plant propagation techniques for the students and teachers of Nangaan High School. The session discussed the basic principles and importance of plant propagation, including sexual and asexual propagation methods, proper selection and preparation of planting materials, seed propagation, cutting, grafting, budding, and other techniques appropriate for different horticultural crops. Emphasis was given to the practical application of propagation techniques in vegetable and perennial crop production, particularly in producing healthy, uniform, and high-quality planting materials. For vegetables, proper propagation and seedling management are essential for establishing vigorous crops, ensuring uniform growth, and improving productivity, while for perennial crops such as fruit trees, grafting, budding, and cutting techniques provide an efficient means of multiplying desirable varieties, maintaining superior characteristics, reducing the time to production, and improving plant establishment.

Through the hands-on and practical discussion, students and teachers gained useful knowledge and skills that can be applied in the establishment and management of the school garden, nursery, fruit tree area, and other horticultural activities. The activity also strengthened learning by doing, technology transfer, and peer-to-peer learning, demonstrating the important contribution of the MS Horticulture Program in developing

practical horticultural competencies, promoting food production, and providing students with skills that can support future livelihood and sustainable agricultural practices.



**Figure 11. Mr. Harvy Gusinalem, as MS Horticulture student and DOST-GREAT scholar, served as a resource speaker during the capacity-building activity on sexual propagation of vegetable and perennial crops for the students and teachers of Nangaan High School.**

The session covered the basic principles of sexual propagation, including seed selection, seed quality, seed viability, proper seed sowing, seedbed and nursery preparation, germination requirements, seedling care, and proper transplanting techniques. Emphasis was placed on the importance of using quality seeds and applying appropriate propagation practices to produce healthy, vigorous, and uniform planting materials. For vegetable crops, sexual propagation through seeds is essential for efficient crop establishment, uniform growth, and improved productivity, while in perennial crops, proper seed propagation is useful for producing planting materials and maintaining a continuous supply of seedlings for orchard and agroforestry development.

The activity provided the participants with practical knowledge that can be applied in the establishment and management of the Gulayan sa Paaralan, nursery, fruit tree garden, and other school-based horticultural activities. Through the session, students and teachers developed greater appreciation of seed-based propagation as a fundamental horticultural skill and gained practical competencies that support food security, sustainable crop production, environmental stewardship, and potential livelihood opportunities.



**Figure 12. MS Horticulture students, together with PhD Agricultural Sciences (Crop Science) faculty, teachers, and students of Nangaan High School, facilitating hands-on vegetable planting and establishment as part of the school garden development, promoting practical skills through learning by doing and technology transfer.**



**Figure 12. MS Horticulture students facilitated the planting of vegetable seedlings, ornamental plants, herbs, and spices as part of the Establishment of an edible landscape.**



# NANGAAN HIGH SCHOOL

## *Training Activities*

# CAPACITY BUILDING (SEMINAR AND WORKSHOP)

*Learning Skills for a Greener and Healthier Community*

PROGRAM

Conducted at Nangaan High School



*Learn  
Grow  
Sustain*

Science • Skills • Community

| TIME                              | TOPIC / ACTIVITY                                                                                                                                                                                                | RESOURCE SPEAKER / FACILITATOR                                                                                                                                                   | REMARKS                                                                      |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 7:30 – 8:00 AM                    | Registration and Opening Program                                                                                                                                                                                | —                                                                                                                                                                                | Welcome Remarks and Orientation                                              |
| <b>SEMINAR / LECTURE SESSIONS</b> |                                                                                                                                                                                                                 |                                                                                                                                                                                  |                                                                              |
| 8:00 – 9:00 AM                    | <ul style="list-style-type: none"> <li>Identification of Different Indigenous Herbs, Spices and Medicinal Plants</li> <li>Different Medicinal Uses of Known Plant Around us</li> </ul>                          | <b>Dr. Monaliza Samael</b><br>Subject Professor<br>PhD in Agricultural Sciences (Crop Science)                                                                                   | Understanding our local plant resources and their health benefits.           |
| 9:00 – 10:00 AM                   | Training on Basic Forage Crop Production and Management                                                                                                                                                         | <b>Dr. Mary Ann B. Rama</b><br>Subject Professor<br>PhD in Agricultural Sciences (Animal Science)                                                                                | Sustainable forage production for livestock development.                     |
| 10:00 – 11:30 AM                  | <ul style="list-style-type: none"> <li>Bio Intensive Approach Gardening and Sustainable Vegetable Crop Production</li> <li>Methods of Plant Propagation</li> <li>Establishment of Edible Landscaping</li> </ul> | <b>Dr. Mark Al-jamie J. Muttulani</b><br>Subject Professor<br>PhD in Agricultural Sciences (Crop Science)                                                                        | Efficient, sustainable and diversified food production and landscape design. |
| 11:30 AM – 1:00 PM                | Lunch Break                                                                                                                                                                                                     | —                                                                                                                                                                                | —                                                                            |
| <b>ACTUAL DEMO SKILLS</b>         |                                                                                                                                                                                                                 |                                                                                                                                                                                  |                                                                              |
| 1:00 – 3:30 PM                    | <ul style="list-style-type: none"> <li>Asexual Plant Propagation: Air Layering, Scion Grafting Techniques</li> <li>Establishment of Vegetable Garden</li> </ul>                                                 | <b>MS Horticulture Students</b><br>Ms. Lea A. Patmonian<br>Mr. Harry Gusinalem<br>Mr. Jun Fred Escoton<br>Ms. Caryl Catipay<br>(both MS Horticulture Students and POST-Scholars) | Hands-on demonstration and practical application of techniques.              |
| 3:00 – 3:30 PM                    | Closing Program (Recap, Synthesis, and Evaluation)                                                                                                                                                              | —                                                                                                                                                                                | Certificates and Closing Remarks                                             |

Empowering Learners through  
Practical Skills and Sustainable Practices



Nangaan High School  
Nangaan, Cotabato



(Date of Activity)

Figure 13. Capacity Building Seminar and Workshop Program

The training activities conducted at Nangaan High School provided participants with practical and relevant knowledge on sustainable agriculture, horticulture, medicinal plants, forage production, and plant propagation. The discussion on the identification of indigenous herbs, spices, and medicinal plants enhanced participants' ability to recognize locally available plant resources and understand their potential uses for health, household needs, and community-based livelihood activities. The session on the medicinal uses of common plants further increased awareness of the importance of indigenous plant knowledge and the responsible utilization of locally available resources.

The training on basic forage crop production and management provided participants with fundamental knowledge on selecting, establishing, maintaining, and utilizing forage crops, particularly for sustainable livestock production. Meanwhile, the sessions on bio-intensive gardening and sustainable vegetable crop production introduced environmentally sound approaches to maximizing vegetable production using available resources while promoting soil health, efficient use of inputs, and sustainable farming practices. Participants also gained practical knowledge on plant propagation methods, including techniques for producing quality planting materials and improving crop establishment.

The discussion on edible landscaping demonstrated how food-producing plants can be integrated into attractive and functional landscapes, allowing participants to maximize available spaces while contributing to household food security. The actual demonstration on asexual plant propagation, particularly air layering and scion grafting, strengthened participants' practical skills in producing true-to-type and quality planting materials. The hands-on activity on vegetable garden establishment likewise enabled participants to apply principles of site preparation, crop arrangement, planting, and garden management.

Overall, the training enhanced the participants' knowledge, practical skills, and appreciation of sustainable and community-based agricultural practices. The participation of MS Horticulture students as facilitators provided them with valuable opportunities to apply their academic and technical knowledge in an actual community setting. The activity also strengthened their competencies in training delivery, hands-on demonstration, communication, teamwork, and extension work, demonstrating the role of the graduate program in preparing future agricultural professionals who can effectively transfer research-based technologies and sustainable farming practices to schools and local communities

### **Pre-Implementation (Community Management)**

The College of Agriculture, through the Department of Crop Science, conducted the monitoring and evaluation of the project in collaboration with its partners from DepEd–Nangaan High School, the Municipal Local Government Units (MLGUs), and other identified partner agencies and stakeholders. The activity included personal interviews and field surveys to obtain a comprehensive assessment of the project's implementation, including identified gaps, lessons learned, and best practices. The evaluation results will serve as a learning document to identify strategies and interventions that need to be improved, strengthened, or sustained, consistent with the goals and directions of the Crop Science–Agriculture Program Team under ESO-USM, in collaboration with public and private agencies and other stakeholders.

Following its implementation, the Plant to Learn Project ensures the continuous care, monitoring, and utilization of the established plants as educational and community resources. This approach promotes the sustainability of the project and ensures that the garden continues to serve its intended educational and community purposes.

### **Community Management Goals**

The Community Management component aims to maintain healthy and productive plants for long-term use in academic subjects and learning activities. It also promotes active student and community participation in sustainable gardening practices, strengthens environmental awareness, and encourages responsible stewardship of plant resources. Furthermore, the project seeks to utilize the garden as an experiential learning facility where students can apply classroom knowledge through hands-on activities while fostering community engagement, collaboration, and appreciation of sustainable agriculture.



(a)



(b)

**Figure 11.** Fruit trees planted in nangaan high school garden before (a) during the arboretum project and after (b).



**Figure 12.** Establishment of the vegetable gardens in Nangaan High School planted with leafy, fruit vegetables, legumes and tuberous crops)

## **Roles and Responsibilities**

### **Role Responsibility**

- **Project Coordinator/ Teacher-in-Charge**-Oversees the program, ensures continuity, and schedules activities.
- **Student Garden Committee/ Student Group Activity**- Watering, weeding, composting, and general upkeep.
- **Science Department Teachers**- Integrates garden use into curriculum and lessons.
- **Parent-Teacher Association (PTA)**- Provides support for supplies and maintenance of the garden area.
- **Local Community Volunteers**- Assist in garden maintenance and educational sessions.

### **Sustainability Plan**

- **Watering Schedule**: Daily during summer and every other day during rainy season.
- **Composting System**: Use biodegradable school waste for organic fertilizer.
- **Seed Bank**: Maintain a seed collection for replanting and future expansion.
- **Rotational Care**: Assign student groups weekly for garden care.
- **Budget Source**: School fund allocation, donations from community, and fundraising events.

### **Monitoring and Evaluation**

- **Monthly Plant Health Check**: Conducted by the Science Club.
- **Annual Impact Assessment**: Evaluate learning outcomes and community participation.

### **Community Engagement Activities**

- **Gardening Workshops**: For students and parents.

### **Expected Outcomes**

- A thriving school garden that serves as a learning hub.
- Increased environmental literacy among students.
- Stronger school-community partnerships.
- Reduction of biodegradable waste through composting.

## Methodological Framework

In summary, the methodological framework for the Plan to Learn Extension Project consists of three phases: Pre-Implementation (Planning: Site Assessment, Soil Analysis, Lay-out Design, Training and orientation), Implementation (Planting and Cultivation), and Post-Implementation (Evaluation of Sustainability and Evaluation & Sustainability).

### METHODOLOGICAL FRAMEWORK





**Figure 13.** Methodological Framework (Planning, Preparation, Planting & Cultivation, Maintenance, Evaluation & Sustainability)

## **ACCOMPLISHMENT REPORT**

### **Plant to Learn Project Accomplishment**

The **Plant to Learn Project** was successfully launched and implemented at Nangaan High School to promote sustainable agriculture, environmental stewardship, and food security among students and the surrounding community. The project aimed to integrate practical agricultural knowledge and skills into the school learning environment while enhancing and maximizing available green spaces for educational and productive purposes.

Through the collaborative efforts of the Municipal Local Government Units (MLGUs), school administrators, teachers, the College of Agriculture–Department of Crop Science, and other community stakeholders, the project successfully established functional **vegetable gardens, medicinal plant areas, and forage plots**. These project components were designed to serve as learning laboratories where students could gain hands-on experience in plant production, propagation, garden establishment, and sustainable agricultural practices.

The implementation of the project also strengthened collaboration between the school, local government units, academic institutions, and the community. Students and teachers were encouraged to actively participate in the establishment, maintenance, and utilization of the gardens, fostering a sense of ownership, responsibility, and environmental awareness. The established areas are expected to provide continuous opportunities for experiential learning and to support lessons related to agriculture, science, environmental education, nutrition, and sustainable food production.

The successful implementation of the **Plant to Learn Project** contributed to the development of a more productive and environmentally sustainable school environment. The project demonstrated the value of partnerships and community participation in promoting agricultural education and environmental responsibility while providing students with practical skills that can be applied in their homes and communities. The project also established a sustainable learning resource that can continuously support academic instruction, community engagement, and future school-based agricultural initiatives.

## MAJOR ACTIVITIES AND OUTPUTS

### 1. Planning and Coordination Meetings



**Figure 14.** Conducted coordination meetings with MLGU officials, barangay representatives, and school staff to finalize the scope of the project. Developed a comprehensive project plan including budget allocation, schedule of activities, and resource-sharing mechanisms.

## 2. Capacity Building and Training



**Figure 15.** Organized technical training sessions for teachers and students on sustainable gardening practices, organic farming, and plant propagation techniques.

## 3. Establishment of Planting Areas



**Figure 16.** Designated 800 square meters of school grounds for vegetable and medicinal plant production. Constructed 10 raised garden beds for easy maintenance and better crop yield.

## IV. ACCOMPLISHMENTS AND IMPACT

The **Plant to Learn Project** has significantly contributed to the transformation of the school environment into a more productive, green, and educational space. Through the establishment of vegetable gardens, medicinal plant areas, and forage plots, the project provided students and teachers with accessible learning resources where agricultural concepts can be translated into actual hands-on experiences. These activities strengthened students' knowledge and skills in plant production, propagation, garden management, environmental conservation, and sustainable agriculture while encouraging them to appreciate the importance of plants in food security, health, and community well-being. Beyond its educational benefits, the project promoted food sustainability and environmental stewardship by encouraging the productive use of available school spaces and the adoption of sustainable gardening practices. The established gardens serve not only as sources of learning but also as models of how schools can contribute to local food production, biodiversity enhancement, and environmental awareness. The project also encouraged students to develop values of responsibility, cooperation, discipline, and care for natural resources through their active participation in planting, maintaining, and monitoring the established areas.

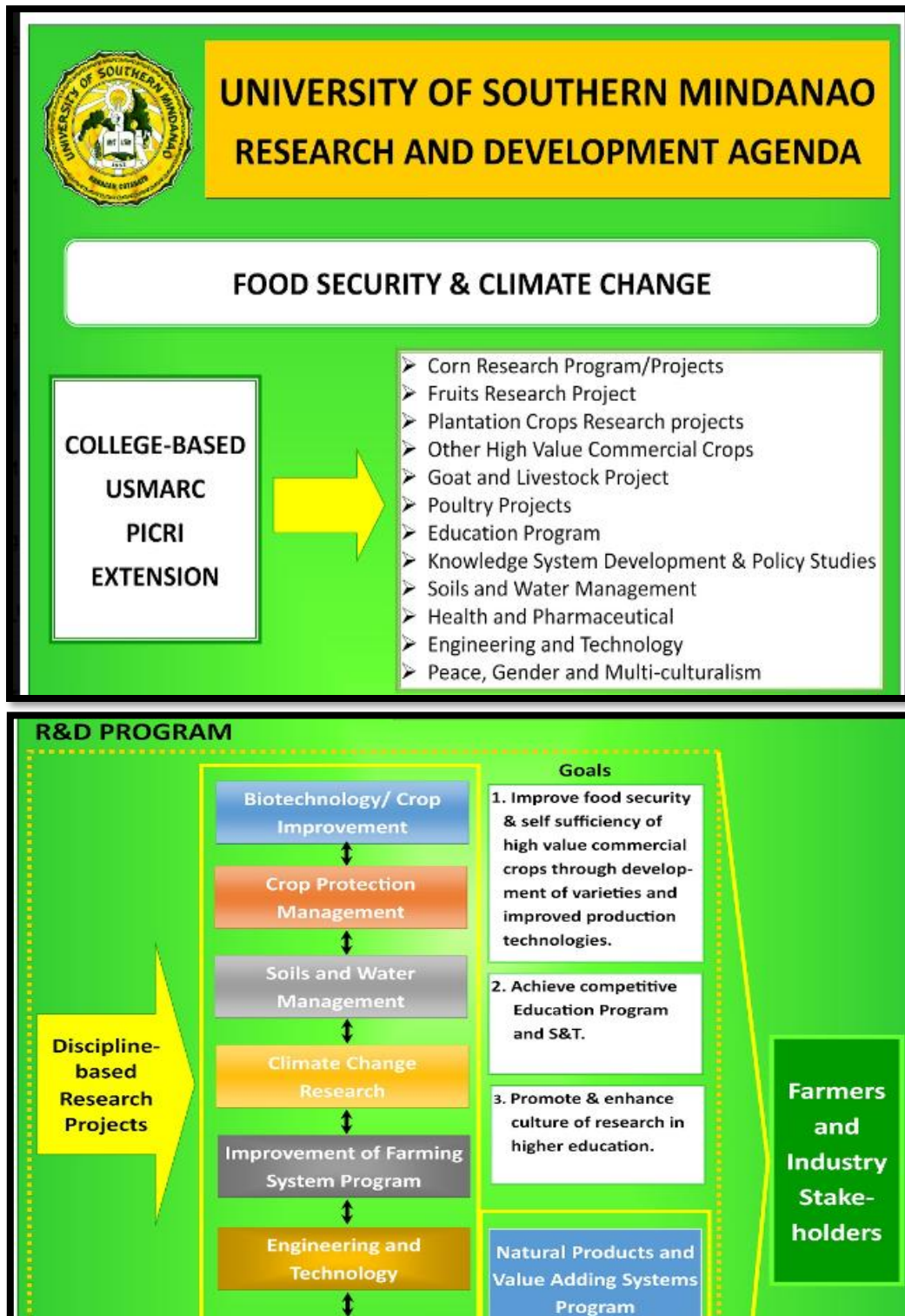
The successful implementation of the project was made possible through the **strong partnership and collaborative efforts of Nangaan High School, the Municipal Local Government Units (MLGUs), the University of Southern Mindanao-College of Agriculture, teachers, students, parents, and other community stakeholders**. Their collective participation provided the necessary support, technical assistance, resources, and manpower for the establishment and maintenance of the project components. This collaboration also strengthened the linkage between the school, local government, higher education institution, and community, demonstrating the importance of multi-sectoral partnerships in implementing sustainable agricultural and educational initiatives.

Furthermore, the project created opportunities for continuous experiential learning and community engagement. The established gardens can be utilized in various academic activities and can serve as demonstration areas for future training, seminars, workshops, and extension activities. Through continuous monitoring, maintenance, and utilization, the project is expected to remain a sustainable learning facility that will benefit succeeding batches of students and provide a model for school-based agricultural development.

The Plant to Learn Project has achieved its objectives of promoting agricultural education, environmental responsibility, sustainable food production, and community participation. Its implementation demonstrates that integrating agriculture into the school environment can provide meaningful learning experiences while contributing to environmental improvement and food security. The strong commitment of the partner institutions and stakeholders provides a solid foundation for sustaining and further expanding the project, ensuring that its benefits will continue to reach students, teachers, families, and the wider community.

a. Show the impact assessment of at least one extension project showing the number of beneficiaries and the changes in their economic, social and other aspects of life.

### 1. USM Research and Extension Agenda



# USM EXTENSION AGENDA

1. Strengthening of linkages between local government and communities through diverse and meaningful extension partnerships and collaboration;
2. Intensification of public information and education campaigns on extension services and programs/projects;
3. Protection and commercialization of knowledge-based products; and
4. Adoption and implementation of Integrated Sustainable Development Approach for Community-based Extension Program/Project

## 2. List of successful extension projects

**Table 1. List of Extension Projects of USM 2019-2024**

| TITLE                                                                                                 | PROJECT LEADER                                               | LOCATION          | BENEFICIARIES                                  | BUDGET    | SCHEDULE OF IMPLEMENTATION | COOPERATING AGENCIES                 |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------|------------------------------------------------|-----------|----------------------------|--------------------------------------|
| Dissemination of Macropropagation Techniques in the Production of Lakatan Banana Plantlets            | Dr. AD Calvo<br>NE Olero<br><b>AA Baladjay</b>               | USMARDC           | Agricultural Technologists, farmers & students | 17,230.40 | 2019 – 2020                | LGU Aleosan, Matalam, Carmen, Cumbio |
| Dissemination of Information on the Proper Management of Lakatan Banana Diseases in Cotabato Province | Dr. AD Calvo<br><b>AA Baladjay</b><br><b>Tamie C. Solpot</b> | Cotabato Province | Banana                                         | 24,600.84 | 2019-2020                  | LGU                                  |
| ICE to RISE: Intensifying Community Engagement through Relevant Instruction, Services and Extension   | <b>Dr. AA Baladjay</b>                                       | USM               | USM Faculty                                    | 7, 278.15 | 2019-2020                  | USM Faculty                          |

| TITLE                                                   | PROJECT LEADER                                                                                                                             | LOCATION        | BENEFICIARIES       | BUDGET       | SCHEDULE OF IMPLEMENTATION | COOPERATING AGENCIES                   |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------|--------------|----------------------------|----------------------------------------|
| USM – CA Extension Services: Agrikonek Gamit ang SocMed | <b>Josephine R. Migalbin</b><br><b>Julius Jerome G. Ele</b><br><b>Tamie C. Solpot</b>                                                      | Online          | Various             | 12,000.00    | 2021-2022                  |                                        |
| USM – CA Ugnayan sa mga Magsasakang Moro at Katutubo    | <b>Josephine R. Migalbin</b><br><b>Julius Jerome G. Ele</b><br><b>Geoffray R. Atok</b><br><b>Jurhamid C. Imlan</b><br><b>Baser Mamalac</b> | BARMM           | IP and Moro Farmers | 150,000.00   | 2021-2022                  | Islamic Relief Worldwide - Philippines |
| TABLEA: Pangkabuhayan para sa Kotabatenong Pamayanan:   | <b>Ardniel A. Baladjay</b><br><b>Gwen Iris D. Empleo</b>                                                                                   | Aleosan Tulunan | Cacao farmers       | 3,000,000.00 | 2021-2022                  | LGU Tulunan Aleosan, Antipas           |

| TITLE                                                                                                                                                                        | PROJECT LEADER                                                                                                                                                                                                                                               | LOCATION                                                                             | BENEFICIARIES              | BUDGET       | SCHEDULE OF IMPLEMENTATION | COOPERATING AGENCIES     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------|--------------|----------------------------|--------------------------|
| Development Of Video Materials on Organic Production of Indigenous Vegetables For Dissemination                                                                              | Gelyn V. Amilbahar<br><b>Josephine R. Migalbin</b><br><b>Tamie C. Solpot</b>                                                                                                                                                                                 | Kabacan Elementary Schools                                                           | Elementary School Children | 100,000.00   | 2022-2023                  |                          |
| Tablea: Pangkabuhayan Para Sa Kotabateñong Pamayanan A Community-Based Tablea Production For Sustainable Livelihood In Cotabato                                              | <b>Ardniel A. Baladjay</b><br><b>Gwen Iris D. Empleo</b>                                                                                                                                                                                                     | Tulun, Cotabato<br>Aleosan, Cotabato<br>Antipas, Cotabato                            | Cacao farmers              | 3,000,000.00 | 2022-2023                  | DOST PCAARRD             |
| Consultancy For Agricultural Productivity Enhancement (Cape 2) Program                                                                                                       | Francisco Gil N. Garcia<br>Consultants:<br><b>Josephine R. Migalbin</b><br><b>Geoffray R. Atok</b><br><b>Jurhamid C. Imlan</b>                                                                                                                               | Cotabato Province<br>South Cotabato Province<br>Sultan Kudarat<br>Sarangani Province | Farmers                    | 1,800,000.00 | 2022-2023                  | DOST XII                 |
|                                                                                                                                                                              | <b>Tamie C. Solpot</b><br><b>Lorelyn Joy T. Milagrosa</b><br><b>Mark Al-jamie J. Muttulani</b><br><b>Edward A. Barlaan</b><br><b>Joseph Castillo</b>                                                                                                         | General Santos City                                                                  |                            |              |                            |                          |
| CacaoFutures: Production of Cacao Quality Planting Materials (OPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects                           | <b>Tamie C. Solpot</b>                                                                                                                                                                                                                                       | North Cotabato                                                                       | Cacao farmers              | 600,000.00   | 2022-2023                  | Sen. Pia Cayetano Office |
| Community-Based Tablea Production for Sustainable Livelihood in Cotabato                                                                                                     |                                                                                                                                                                                                                                                              | Antipas                                                                              |                            |              |                            |                          |
| Implementation of Upgraded Consultancy Services and Technical Assistance for MSMEs through Consultancy for Agricultural Productivity Enhancement (CAPE) Program in Region 12 | Francisco Gil N. Garcia<br>Consultants:<br><b>Josephine R. Migalbin</b><br><b>Geoffray R. Atok</b><br><b>Jurhamid C. Imlan</b><br><b>Tamie C. Solpot</b><br><b>Lorelyn Joy T. Milagrosa</b><br><b>Mark Al-jamie J. Muttulani</b><br><b>Edward A. Barlaan</b> | North Cotabato<br>South Cotabato<br>Sarangani<br>Sultan Kudarat                      | Farmers                    | 1,800,000.00 | 2021-2022                  | DOST XII                 |
| SOXAARDEC: Kaagapay ng Magsasaka sa Krisis at Kalamidad                                                                                                                      | Elizabeth Molina<br><b>AA Baladjay</b>                                                                                                                                                                                                                       | North Cotabato                                                                       | Farmers                    | 700,000.00   | 2021-2022                  | CMI                      |

○ **List of Extension Projects 2025**

| Project Title                                                                                                            | Project leader                                                  |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| PLANT TO LEARN: Establishment of Vegetable, Herbs, Spices and Medicinal Plants; and Forage Garden at Nangaan High School | Monaira I. Sumael, Mark Al-Jamie J. Muttulani, Mary Ann B. Rama |

### 3. Impact Studies of the Extension Project: Plant to Learn Project



UNIVERSITY OF SOUTHERN MINDANAO  
Graduate School  
Kabacan, Cotabato



## PART II

# IMPACT ASSESSMENT REPORT

*This section provides information on the impact of the Plant to Learn Extension project. The impacts assessed are economic, social, and nutritional impacts while capturing beneficiaries' experiences and recommendations.*

## **Impact Pathway of the Plant to Learn Project Using the Theory of Change (ToC) Framework**

The **long-term impact goal** of the Plant to Learn Project is to create a sustainable and eco-friendly school and community environment that promotes **food security, environmental stewardship, and quality education** by integrating plant-based learning into the school curriculum and community engagement activities.

The project is aligned with the following **Sustainable Development Goals (SDGs): SDG 2 – Zero Hunger, SDG 4 – Quality Education, SDG 12 – Responsible Consumption and Production, SDG 13 – Climate Action, and SDG 15 – Life on Land**. Through the project, students and community members of Nangaan will develop improved knowledge, skills, and attitudes toward sustainable agriculture, healthy diets, and biodiversity conservation. These improvements are expected to contribute to enhanced food availability, environmental sustainability, and socio-economic resilience within the community.

### **Outcomes (Medium-Term Changes)**

As a medium-term outcome, students and teachers will develop competencies in sustainable gardening, medicinal plant cultivation, and environmentally friendly practices. At least 80% of participating students will demonstrate knowledge of sustainable gardening practices based on practical assessments.

The school grounds will also be transformed into productive and sustainable green spaces that will serve as living laboratories for hands-on learning and as potential sources of food and plant-based resources for the school community.

At least 800 square meters of green space will be established and planted with vegetables, herbs, medicinal plants, and forages. In addition, community awareness and participation in home gardening, food production, and environmentally responsible practices will be strengthened.

### **Outputs (Short-Term Results)**

The project will generate the following short-term outputs:

- a. Training sessions conducted on organic gardening, composting, sustainable agriculture, and plant-based health remedies for teachers and students.
- b. School garden established with vegetables, herbs, medicinal plants, and forages to serve as a demonstration and learning area.
- c. Educational materials such as learning modules, posters, and videos developed and integrated into classroom instruction.

d. Community engagement activities conducted, including gardening contests, tree-planting activities, food security seminars, and other environmental and agricultural initiatives.

## **Activities**

To achieve the intended outputs and outcomes, the following activities will be implemented:

- a. Conduct capacity-building workshops for teachers and students on sustainable agriculture, organic gardening, composting, and environmental stewardship.
- b. Develop learning modules and instructional materials that integrate gardening and plant-based learning into science, health, environmental, and other relevant subjects.
- c. Establish model school gardens and plant nurseries featuring vegetables, herbs, spices, medicinal plants, and forages.
- d. Organize community involvement programs in partnership with the Municipal Local Government Units (MLGUs), barangays, parents, local farmers, and other community stakeholders.
- e. Monitor and evaluate project implementation and outcomes through baseline and endline surveys, practical assessments, and regular project monitoring.

## **Inputs**

The successful implementation of the Plant to Learn Project will require the following resources:

- a. Human Resources:** Teachers, students, local agriculture experts, LGU personnel, parents, and community volunteers.
- b. Materials:** Seeds, seedlings, organic fertilizers, composting materials, gardening tools, plant-growing supplies, and learning resources.
- c. Financial Support:** School funds, LGU subsidies, and potential financial or material support from non-government organizations (NGOs), private organizations, and corporate social responsibility (CSR) programs.
- d. Institutional Support:** Supportive policies and programs from the Department of Education (DepEd), barangay and LGU support, parent-teacher associations, and other community stakeholders.

## Theory of Change Flow

**Inputs → Activities → Outputs → Outcomes → Impact**

If adequate resources, technical assistance, institutional support, and community participation are provided, and school gardens and plant nurseries are established, **then** students and teachers will actively engage in hands-on, plant-based learning and sustainable agricultural practices. **This will lead to** improved knowledge, skills, attitudes, and practices related to sustainable agriculture, environmental stewardship, healthy food production, and biodiversity conservation. **Consequently, this will contribute to** increased food security, expanded green spaces, improved environmental responsibility, and greater socio-economic resilience among the school and community.



**Figure 1.** Impact Pathway of Plant to Learn Extension Project using the Theory of Change (ToC) Framework.



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Graduate School  
Kabacan, Cotabato



# **FOOD SECURITY AND NUTRITION**

*A holistic approach to education that combines classroom learning with practical gardening to foster food security and healthy lifestyles.*



## **Key Results of the Plant to Learn Project**

### **Establishment of Productive Gardens**

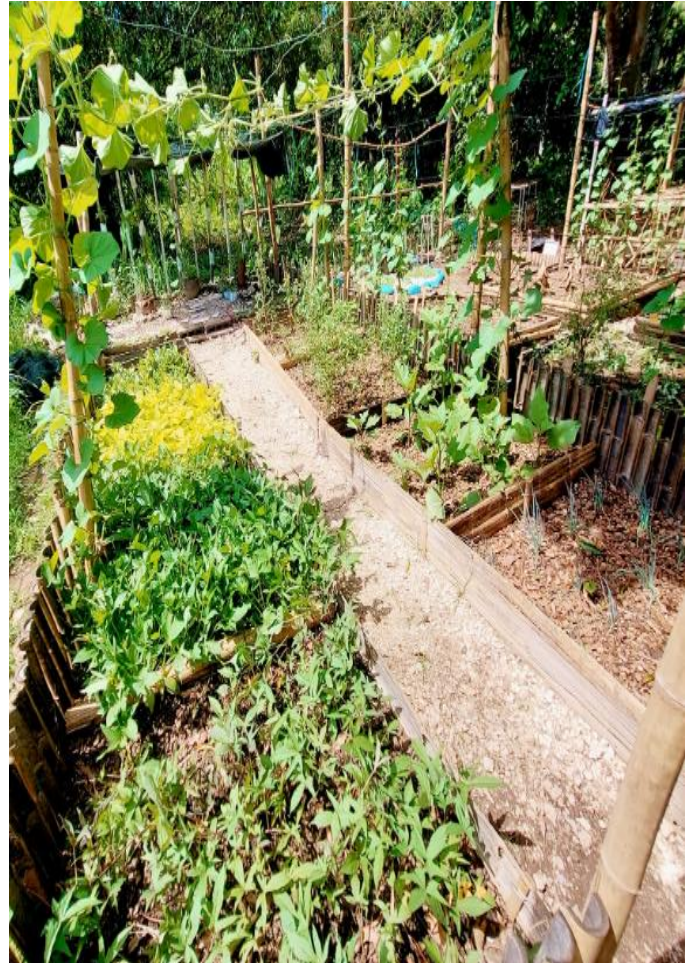
Successfully developed and maintained school-based gardens that include a wide variety of vegetables, herbs, and spices within the campus.



**Figure 2. Establishment of edible landscape vegetable garden as sources of vegetable crops.**

**Created designated green spaces that promote sustainable agriculture practices and environmental stewardship among students.**

Implemented eco-friendly and organic methods such as composting, mulching, and natural pest control (planting of insect repellent crops), ensuring that the gardens serve as a model for sustainable farming practices in the community.



**Figure 3. Establishment of eco-friendly vegetable organic gardens (companion cropping system planted with insect repellent crops)**

## Active Student Engagement and Hands-On Learning

Involved 200 students from different grade levels in practical training sessions and hands-on activities, enabling them to apply classroom knowledge to real-life gardening scenarios.

Students actively participated in soil preparation, planting, watering, weeding, and harvesting, enhancing their sense of responsibility and teamwork.

Encouraged innovation by letting students experiment with intercropping, companion planting, and organic fertilizers to improve yield and soil health.



**Figure 4. Establishment of vegetable garden areas, designed with vegetable intercropping and companion planting systems to improve the yield of vegetable crops.**

## Capacity Building through Training and Workshops

Conducted comprehensive training sessions on vegetable, herb, and spice production, which provided students with technical skills and agricultural knowledge. Topics covered include seed selection and propagation, soil management, pest and disease control, organic farming techniques, and post-harvest handling.

Provided students with insights on the nutritional and economic benefits of cultivating vegetables and herbs, fostering awareness of food security and healthy eating habits.



**Figure 5. Capacity building training activities “Plant to Learn Extension Project”.**

## **Knowledge Transfer and Community Impact**

Students shared what they learned with their families and communities, promoting home gardening and sustainable food production practices.

The project contributed to increased awareness of food security among students, parents, and teachers, emphasizing the role of local food production in addressing hunger and malnutrition.

Some students initiated their own mini gardens at home, applying the techniques they had learned during training.



**Figure 6. Students initiated their own mini garden at home, applying techniques learned from the training.**

## **Sustainability and Continuity**

Established a sustainable garden maintenance and management plan through student-led committees and regular teacher supervision, ensuring the continued care, productivity, and long-term sustainability of the school gardens. Developed seed banks and composting systems to ensure a continuous supply of planting materials, recycle organic waste, improve soil fertility, and reduce dependence on externally sourced inputs. These initiatives strengthened students' sense of responsibility and ownership while promoting sustainable, low-cost, and environmentally friendly gardening practices within the school and community.

## **Improved Student Awareness and Behavior**

A total of 200 students gained essential knowledge and practical skills in crop production and sustainable gardening, resulting in increased awareness of environmental stewardship, responsible food production, and healthy food choices. Through hands-on learning experiences, students developed a more positive attitude toward agriculture, recognizing its importance not only as a source of nutritious food but also as a means of ensuring food security, creating livelihood opportunities, and promoting environmental and ecological sustainability. The project also strengthened students' appreciation of the value of plants and sustainable agricultural practices in building a healthier, more resilient, and environmentally responsible community.



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# ***ECONOMIC IMPACT***

*The economic impact of the Plant to Learn Extension Project is a critical measure of its overall success, as it reflects how the project contributes to financial sustainability, cost savings, and income generation for both the school and the participating students' households.*



The Plant to Learn Project provided significant economic value to both the school and the participating students. By establishing vegetable, herbs, and spices gardens, the project not only

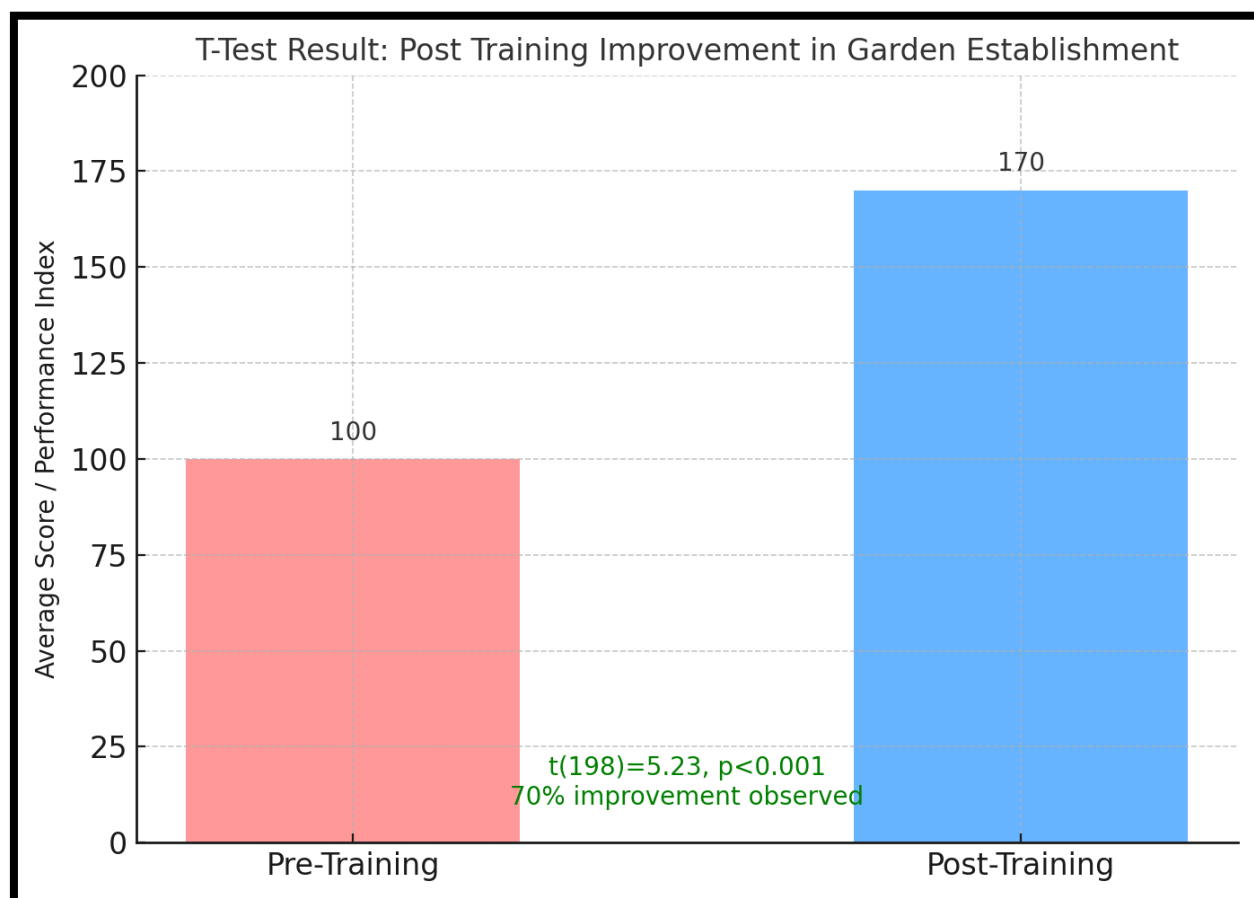


supplied nutritious food but also created opportunities for cost savings, income generation, and entrepreneurial skills development. After comprehensive training, 200 students gained essential knowledge and practical insights on sustainable gardening, enabling them to cultivate crops both in school and at home. This knowledge allows families to reduce household food expenses, increase dietary diversity, and even create small income streams by selling surplus produce.

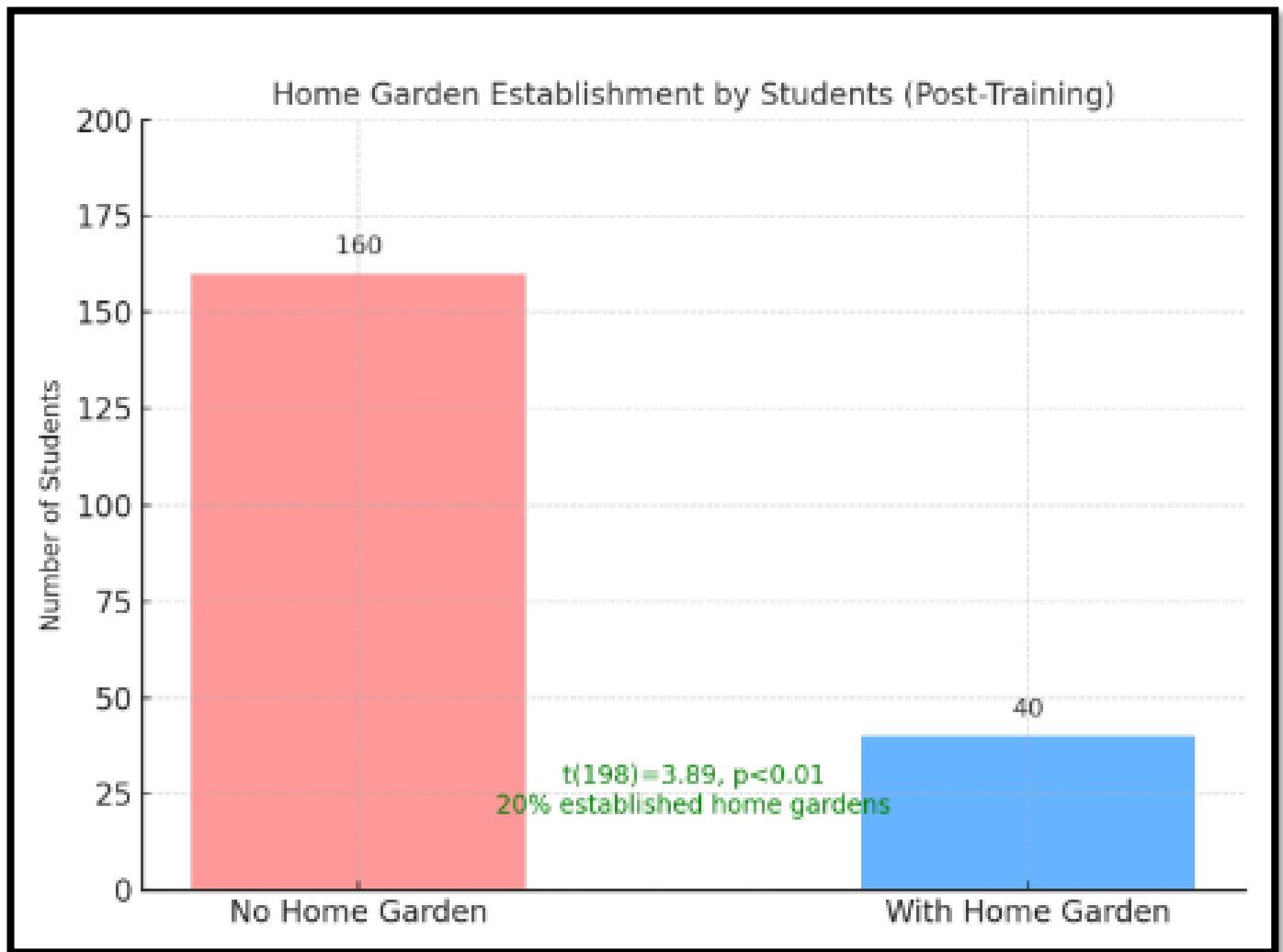
The project fostered economic resilience by introducing students to agribusiness concepts such as cost-benefit analysis, value addition, and marketing strategies for herbs and spices. Furthermore, the initiative contributed to food security, reducing dependency on market-purchased vegetables and spices, which are often affected by price fluctuations.

| KRA                                     | Description                                                                                    | Performance Indicators                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Garden Establishment</b>          | Set up and maintain a productive vegetable, herbs, and spices garden within the school campus. | <ul style="list-style-type: none"> <li>- 100% completion of garden plots</li> <li>- Irrigation system installed</li> <li>- Organic farming practices implemented</li> </ul> |
| <b>2. Student Knowledge and Skills</b>  | Train <b>200 students</b> on sustainable crop production techniques.                           | <ul style="list-style-type: none"> <li>- 200 students completed training</li> <li>- 70% improvement in post-training assessment scores</li> </ul>                           |
| <b>3. Student Participation</b>         | Engage students in practical gardening activities for experiential learning.                   | <ul style="list-style-type: none"> <li>- 90% participation in planting and maintenance</li> <li>- Formation of student garden committees</li> </ul>                         |
| <b>4. Production and Utilization</b>    | Harvest and use garden produce for school and community benefit.                               | <ul style="list-style-type: none"> <li>- At least 100 kg of produce harvested</li> <li>- Integration into feeding program or sale</li> </ul>                                |
| <b>5. Sustainability and Innovation</b> | Ensure long-term continuity and economic value through resource generation and innovation.     | <ul style="list-style-type: none"> <li>- Creation of a seed bank and compost system</li> <li>- At least 20% of students establish home gardens</li> </ul>                   |

| KRA                        | Description                                                       | Performance Indicators                                                                                                                                      |
|----------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6. Community Impact</b> | Extend benefits and awareness of food security beyond the school. | <ul style="list-style-type: none"> <li>- 200 households reached through student knowledge sharing</li> <li>- Community showcase events conducted</li> </ul> |



**Figure 7.** T-Test Result: Post Training Improvement (70% improvement observed) in Garden Establishment at Nangaan High School.



**Figure 8.** Figure showing that 20% of the 200 students (40 students) established home vegetable gardens, medicinal herb/spice, forage gardens after the training, using a simple t-test.

## Economic Impact

The **Plant to Learn Project** has generated meaningful economic benefits for students, families, and the school community by promoting food production, resource conservation, and practical livelihood skills. Through school-based gardening and hands-on agricultural activities, families are encouraged to produce their own vegetables, herbs, and spices, thereby reducing their dependence on market-purchased food and helping lower household expenses. This is particularly beneficial to low-income families, as home and school gardening provides an accessible and affordable source of nutritious food.

The project also creates opportunities for **income generation and entrepreneurship**. Students are introduced to basic agribusiness concepts, including production, value-adding, marketing, and the sale of surplus garden produce. High-demand vegetables, herbs, and spices can potentially be developed into small-scale income-generating ventures, providing students and participating households with practical experience in entrepreneurship and agricultural enterprise development.

Another important economic contribution is the **long-term value of the skills acquired by students**. The knowledge and practical competencies gained through training and hands-on gardening activities provide students with skills that can be applied at home, in future employment, or in their own agricultural enterprises. In this way, the project serves as a practical and cost-effective alternative to formal training while building students' confidence and readiness for future careers in agriculture and related fields.

The project further contributes to **school sustainability** by allowing garden produce to support school-based feeding programs and other nutritional initiatives. Surplus produce may also be sold, with the generated income reinvested in seeds, planting materials, gardening tools, composting activities, and other project requirements. This creates a **self-supporting cycle of production and reinvestment**, helping ensure the continuity of the school garden beyond the initial implementation period.

## Key Economic Benefits

Plant to Learn Project contributes to the local economy through **cost savings, income opportunities, skills development, entrepreneurship, and institutional sustainability**. Families benefit from reduced expenditures on commonly consumed vegetables, herbs, and spices, while students gain practical knowledge in agriculture and agribusiness. Surplus produce provides opportunities for small-scale selling and micro-enterprise development, particularly for high-value and high-demand crops. At the school level, garden products can supplement feeding programs or generate modest funds for the continued maintenance and expansion of the project. Collectively, these benefits demonstrate that school gardening can serve not only as an educational initiative but also as a **practical strategy for improving household resilience, strengthening food security, and developing future livelihood opportunities**.



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# **SOCIAL AND PSYCHOLOGICAL IMPACT**

*The Plant to Learn Project is not only an agricultural initiative but also a social and psychological development program that shapes students' values, attitudes, and mental well-being. These impacts are essential because education today goes beyond academics ~~that~~ must nurture emotional resilience, interpersonal skills, and social responsibility.*



## **Social and Psychological Impacts of the Plant to Learn Project**

The **Plant to Learn Project** provides significant social and psychological benefits that extend beyond the development of agricultural knowledge and skills. Through hands-on gardening activities, students develop positive relationships with their peers, teachers, families, and the environment. The project creates opportunities for students to work collaboratively, develop confidence, manage stress, and cultivate values such as responsibility, empathy, and environmental stewardship. These social and psychological outcomes are important because they contribute to the development of well-rounded, resilient, and socially responsible learners.

### **Fosters Teamwork and Social Responsibility**

Gardening activities encourage **collaboration and teamwork**, as students work together to plan, prepare, plant, maintain, and harvest crops. Each student is given an opportunity to contribute to the success of the school garden, fostering a sense of shared responsibility and accountability. Through these activities, students develop important **leadership, communication, cooperation, and problem-solving skills** that can be applied in both academic and real-life situations.

Working toward a common goal also strengthens interpersonal relationships among students and promotes a stronger sense of community within the school. These experiences help students appreciate the value of cooperation, respect the contributions of others, and understand that collective efforts can produce meaningful results. In the long term, these skills contribute to improved social interaction, responsible citizenship, and successful participation in community activities.

### **Strengthens Connection with Nature and Community**

The project provides students with meaningful **hands-on experiences that strengthen their connection with nature and the environment**. By caring for plants and observing their growth, students develop a deeper appreciation for natural resources and gain a better understanding of sustainable living and environmental conservation.

The project also encourages students to share their knowledge and experiences with their families, neighbors, and other community members. This strengthens community participation and creates opportunities for the exchange of traditional and modern agricultural knowledge. Seeing the school grounds become productive and attractive green spaces also gives students a **sense of belonging, ownership, and pride** in their school.

As a result, the project helps develop environmental stewardship and active citizenship while encouraging students to become more responsible toward their surroundings and their community.

### **Reduces Stress and Supports Psychological Well-Being**

Gardening provides students with a **calm, meaningful, and engaging activity** that can help reduce everyday stress and promote psychological well-being. Spending time outdoors, interacting with plants, and engaging in purposeful physical activities can provide opportunities for relaxation, mindfulness, and improved concentration.

The school garden can serve as a positive learning environment where students can temporarily step away from academic pressures and participate in activities that promote patience, focus, and emotional balance. Gardening also provides a healthy and productive alternative to excessive screen time and encourages students to spend more time outdoors.

Through regular participation in gardening activities, students may develop greater **emotional resilience, self-esteem, patience, and positive attitudes**, contributing to a healthier and more supportive school environment.

### **Increases Self-Confidence and Motivation**

The process of planting seeds, caring for crops, and eventually harvesting the fruits of their efforts gives students a strong **sense of achievement and purpose**. Seeing a seed develop into a healthy plant and produce food allows students to directly experience the results of their hard work, patience, and commitment.

These accomplishments help strengthen students' **self-confidence and motivation** and encourage them to take on new challenges. Students also gain a sense of empowerment when they realize that their efforts can contribute to food production, environmental protection, and the well-being of their school and community.

The practical and rewarding nature of gardening can strengthen **intrinsic motivation, perseverance, and personal growth**, which may positively influence students' participation and engagement in other areas of learning.

## Promotes Inclusivity and Empathy

The Plant to Learn Project promotes an **inclusive learning environment** by providing opportunities for students with different abilities, backgrounds, and levels of gardening experience to participate in meaningful activities. Gardening tasks can be shared among students according to their interests and capabilities, allowing everyone to contribute to the project.

Students learn to assist and support one another, particularly those who may have limited experience or confidence in gardening. Caring for living plants also encourages **patience, empathy, compassion, and responsibility**. These values can extend beyond the garden and influence how students interact with their classmates, teachers, families, and other members of the community.

Ultimately, the project contributes to the development of a **caring, supportive, and inclusive school culture** where students feel valued and encouraged to work together. This benefits not only individual students but also the broader school and community by strengthening social cohesion and promoting positive relationships.

## Social and Psychological Significance

The Plant to Learn Project demonstrates that school gardening can serve as more than an agricultural and educational activity. It provides a **supportive platform for social interaction, personal development, emotional well-being, and community participation**. By working together in the garden, students develop cooperation, confidence, empathy, responsibility, and a stronger connection with nature. These social and psychological benefits help create a positive learning environment and contribute to the development of **healthy, resilient, environmentally responsible, and socially engaged young people**.



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# **KNOWLEDGE TRANSFER AND SUSTAINABILITY**

*The Plant to Learn Project ensures that the gardening knowledge and practical skills gained by trained students extend beyond the school environment to their homes and the wider community. By applying what they have learned in vegetable, herbs, and spices production, students become agents of change for food security and sustainable agriculture*



## **Knowledge Transfer and Sustainability**

The Plant to Learn Project is designed to ensure that the knowledge, skills, and values acquired by students extend beyond the classroom and create lasting benefits for their families and the wider community. Through practical and participatory learning, students become active knowledge carriers and advocates for sustainable agriculture, food security, and environmental stewardship. The project promotes a continuous cycle of learning in which students apply what they learn in school, share their experiences with others, and encourage the adoption of sustainable gardening practices at home and in the community.

Knowledge transfer is strengthened through peer-to-peer learning, where students demonstrate basic gardening techniques to their classmates during Science, Technology and Livelihood Education (TLE), and other related classes. Students are also encouraged to apply their acquired skills by establishing mini home gardens, enabling their families to produce vegetables, herbs, and spices for household consumption. This approach not only reinforces learning but also helps reduce household food expenses and promotes healthier food choices.

The project further extends its reach through family and community engagement activities, including gardening demonstrations, school open-house events, and community training sessions. During these activities, students have opportunities to share practical gardening techniques and sustainable practices with parents, farmers, and other community members. To support continuous learning, the project will develop and distribute gardening guides, posters, learning modules, and digital materials that can be used by students, teachers, families, and community members. A student mentorship system will also be established, wherein more experienced or advanced students guide younger learners in gardening activities. This creates a continuous learning cycle and helps ensure that knowledge is passed from one group of learners to the next.

Through these knowledge-transfer mechanisms, the project aims to reach at least 200 households, encouraging the wider adoption of sustainable home gardening practices within the local community. In the long term, the project seeks to establish a network of student advocates who can promote food security, environmental responsibility, healthy food production, and sustainable agricultural practices among their families and communities.

## **Sustainability Plan**

To ensure that the benefits of the Plant to Learn Project continue beyond its initial implementation, a comprehensive sustainability plan will be established. Resource sustainability will be promoted through the establishment of a seed bank using seeds collected from harvested crops, ensuring a continuous supply of planting materials for succeeding production cycles. A school-based composting system will also be maintained using biodegradable and organic waste generated within the school, helping improve soil fertility while reducing the need for commercially purchased fertilizers. Where feasible, rainwater collection systems will be developed to supplement irrigation and support garden maintenance, particularly during dry periods.

Organizational sustainability will be strengthened through the formation of Student Garden Committees under the guidance and supervision of teachers. These committees will be responsible for assisting in garden maintenance, monitoring plant growth, organizing gardening activities, and promoting responsible use of garden resources. Gardening will also be integrated into relevant school subjects and programs, particularly Science, TLE, and other agriculture-related learning areas, ensuring that plant-based learning becomes a regular component of students' educational experiences. Partnerships with LGUs, NGOs, local farmers, agricultural experts, and agri-businesses will also be strengthened to provide technical assistance, planting materials, equipment, and other forms of support.

Financial sustainability will be supported through the productive use of garden outputs. Surplus vegetables, herbs, spices, and other produce may be sold to generate funds for the maintenance, expansion, and improvement of the school gardens. A portion of available school funds and partner grants may also be allocated to sustain essential project activities. In addition, the project may explore value-adding and entrepreneurial activities, such as the production of dried herbs, spice blends, and other plant-based products, providing students with opportunities to develop basic entrepreneurship and agribusiness skills while generating additional resources for the project.

Finally, educational sustainability will be ensured by incorporating gardening activities into regular school programs and learning experiences. Annual gardening activities, training sessions, competitions, and recognition programs may be conducted to maintain student interest, participation, and motivation. The development of digital learning modules, instructional materials, and documentation of best practices will further support continuous knowledge sharing among current and future students.

Through these interconnected strategies, the Plant to Learn Project can develop into a self-sustaining school-community initiative. By combining resource management, organizational support, income-generating activities, and continuous learning, the project can maintain its gardens, strengthen student participation, extend its benefits to households, and promote sustainable agricultural practices for years to come.

## Knowledge Transfer and Sustainability Summary Chart

| Component                            | Key Actions                                                                                                                                                                                                                                                             | Key Results                                                                                                                                                                              |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Knowledge Transfer</b>            | <ul style="list-style-type: none"> <li>- Training for 200 students on gardening techniques</li> <li>- Peer-to-peer sharing</li> <li>- Family engagement</li> <li>- Community demos and open-house events</li> <li>- Creation of guides and digital materials</li> </ul> | <ul style="list-style-type: none"> <li>- 200 students gained practical knowledge and households benefited</li> <li>- Students conducted community knowledge sharing</li> </ul>           |
| <b>Resource Sustainability</b>       | <ul style="list-style-type: none"> <li>- Seed bank establishment</li> <li>- Composting system</li> <li>- Rainwater harvesting</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>- Continuous supply of seeds and organic fertilizer</li> <li>- Reduced dependency on external resources</li> <li>- Reliable irrigation</li> </ul> |
| <b>Organizational Sustainability</b> | <ul style="list-style-type: none"> <li>- Student garden committees</li> <li>- Teacher supervision</li> <li>- Integration into curriculum (Science, TLE, EPP)</li> </ul>                                                                                                 | <ul style="list-style-type: none"> <li>- Garden maintained regularly</li> <li>- Gardening as part of school program</li> <li>- Active student participation sustained</li> </ul>         |
| <b>Financial Sustainability</b>      | <ul style="list-style-type: none"> <li>- Sale of surplus produce</li> <li>- Partnerships with LGUs and NGOs</li> <li>- Value-added products (dried herbs, spice mixes)</li> </ul>                                                                                       | <ul style="list-style-type: none"> <li>- Income generated for garden upkeep</li> <li>- Long-term funding support</li> <li>- Entrepreneurial opportunities for students</li> </ul>        |
| <b>Educational Sustainability</b>    | <ul style="list-style-type: none"> <li>- Annual training sessions</li> <li>- Student competitions</li> <li>- Digital learning modules</li> </ul>                                                                                                                        | <ul style="list-style-type: none"> <li>- Continuous skill enhancement</li> <li>- Increased student engagement</li> <li>- Knowledge accessible anytime</li> </ul>                         |



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# ***CULTIVATING CHANGE:***

Stories of Transformation from  
Plant to Learn Project



## INTRODUCTION

The Plant to Learn Extension Project at Nangaan High School exemplifies how education can become a powerful instrument for transforming lives when classroom learning is connected with meaningful, hands-on experiences. Conceived to promote sustainable agriculture, food security, environmental stewardship, and healthy living, the project provided students and teachers with opportunities to learn, practice, and share practical knowledge in vegetable, herb, spice, and other plant-based production within the school and their homes. Through a combination of capacity-building activities, hands-on gardening, and community engagement, 200 students gained essential knowledge, practical skills, and positive attitudes toward sustainable gardening and responsible food production. Teachers likewise strengthened their roles as facilitators, mentors, and advocates of experiential learning by integrating agricultural concepts and environmental practices into their classroom instruction. What began as a school gardening initiative gradually developed into a meaningful learning experience that connected academic concepts with real-life applications and encouraged students to become more responsible, productive, and environmentally conscious members of the community. The project's impact extends beyond the school garden.

Students were encouraged to apply their learning by establishing mini home gardens, enabling their families to produce fresh vegetables, herbs, and spices while contributing to household food security and reducing food expenses. Teachers incorporated plant-based and agricultural concepts into daily lessons, creating opportunities for learners to appreciate the importance of agriculture not only as a source of food but also as a potential livelihood and entrepreneurial opportunity. Through these experiences, students developed teamwork, leadership, self-confidence, responsibility, creativity, and self-reliance, while strengthening their appreciation of nature and sustainable living.

The success stories emerging from the project reflect its broader social, educational, economic, and environmental significance. They tell of students who transformed small spaces at home into productive gardens, families who benefited from home-grown food, and teachers who found innovative ways to connect agricultural practices with classroom learning. More importantly, these stories demonstrate how a simple school garden can become a living laboratory for learning, a source of food, a platform for community engagement, and a foundation for future livelihood opportunities. Ultimately, the Plant to Learn Extension Project demonstrates that education becomes more meaningful when learners are given the opportunity to learn by doing, share what they know, and apply their knowledge to real-world challenges. By bringing together students, teachers, families, local government units, and community partners, the project has helped cultivate not only plants but also knowledge, responsibility, resilience, and hope for a more sustainable future. Its experiences affirm that when young people are empowered with practical skills and given the opportunity to contribute, they can become effective advocates for food **security, environmental stewardship, and sustainable community development.**

## **SUCCESS STORIES AND BENEFICIARY NARRATIVES**

The Plant to Learn Extension Project has created meaningful changes not only in the school garden but also in the lives of teachers, students, families, and community members. The experiences of Teacher Bai Dilangalen, student Amerudin Dalandang, and Teacher-in-Charge Wency Pacheca illustrate how the project transformed agricultural knowledge into practical action and strengthened the connection between education, food security, environmental conservation, and community development.

### **Story 1. Teacher Bai Dilangalen**

#### ***“Empowering Others Through Shared Knowledge and Resources”***

Teacher Bai Ali Dilangalen, a teacher and former coordinator of the Gulayan sa Paaralan at Nangaan High School, has demonstrated strong commitment and enthusiasm in encouraging students to participate in agricultural activities. As a TLE teacher, she has played an important role in guiding fellow teachers and students in implementing gardening activities. Her dedication to quality education and her willingness to seek partnerships have contributed significantly to strengthening the school's agricultural and environmental initiatives.

#### **Reflecting on her experience, Teacher Bai shared:**

“Ako po si Teacher Bai Ali Dilangalen. Ako po ay dating coordinator sa Gulayan sa Paaralan. As the TLE teacher, ako ang nagguguide sa aking co-teachers na naghahandle ng TLE dito sa Nangaan High School. Sa ngayon, ako na po ang school head ng paaralan at napag-isipan po naming mag-reach out specifically kay Dr. Sumael para kami ay matulungan.”

Her initiative to establish a partnership with the University of Southern Mindanao (USM), particularly through the Crop Science and Agriculture programs, opened new opportunities for the school. The provision of free planting materials, including fruit seedlings, vegetable seeds, forage crops, medicinal plants, herbs, and spices, significantly reduced the financial burden previously experienced by the school.

Before the project, teachers often had to purchase planting materials using their own resources. Teacher Bai explained:

“Dati ang mga seedlings namin, sir, kuot bulsa po talaga si teacher kasi syempre kung bibili ka sa palengke ng isang sachet, nasa 100 pesos at 90 pesos. Nahihirapan kami. Since may mga project po si Ma’am Monaira kasama ang Department of Agriculture ng USM, sabi ko, mag-reach out tayo sa kanila para mas maganda ang kalalabasan ng Gulayan natin.”

She recalled that the school had previously achieved success in the Gulayan sa Paaralan, even reaching the division level, but maintaining the garden required considerable

financial resources. The partnership with USM therefore became an important source of technical and material support that helped the school strengthen and sustain its gardening activities.

For Teacher Bai, however, the project's greatest contribution went beyond the distribution of planting materials. The technical training and capacity-building activities provided teachers with knowledge that they could confidently transfer to their students.

“Napakalaking tulong po talaga itong program ng Agricultural Science Program, at napaka-grateful namin kasi nabigyan kami ng chance na mapili ng USM, particularly ang Nangaan High School. Nung ako na ang teacher dito, mas nagpursige kaming matulungan ang mga bata. Nakatulong talaga ang programa.”

She emphasized that many teachers handling TLE do not have extensive formal training in agriculture. Consequently, the lectures, demonstrations, and hands-on training conducted by USM experts helped bridge their knowledge gaps, particularly in actual crop production and plant management.

The training also opened their eyes to the value of plants that were already present in their communities. Teacher Bai recalled:

“Nung nakita po namin kayo, nung kayo po ay nag-lecture during our training, doon namin natutunan na, ‘Ah, ganun pala dapat.’ Katulad po ng mga herbal plants na dito lamang pala matatagpuan sa community, yun pala ay may gamit pala.”

The knowledge gained by teachers was subsequently shared with students and parents. Students began recognizing plants in their surroundings and understanding their potential uses, particularly as medicinal and health-promoting plants. This knowledge eventually reached their families.

“May mga magulang na rin ng mga estudyante and nagsabi, ‘Ma’am, herbal po pala ito.’ Kasi nung nag-lecture si Dr. Sumael, na-extend ng mga bata ang kanilang natutunan at kaalaman. Nalaman nila na may mga potential at kahalagahan pala ito sa kalusugan bilang halamang gamot na makikita lamang sa paligid.”

Beyond her role as a teacher, Teacher Bai continues to advocate for the expansion of the school garden as part of the school's extension and community engagement activities. The project has strengthened her confidence in mentoring students, encouraged teachers to learn continuously, and helped establish stronger partnerships between the school, USM, local government, parents, and the community.

Her story demonstrates that empowering teachers with knowledge, resources, and technical support can create a multiplier effect, allowing one trained teacher to influence students, fellow educators, families, and the wider community.

## **Story 2. Mr. Amerudin Dalandang – Student**

### ***“Impactful Learning Experiences”***

For Amerudin Dalandang, a Grade 10 student of Nangaan High School, the Plant to Learn Project provided an opportunity to experience agriculture not simply as a classroom topic but as a practical and meaningful learning activity.

Amerudin expressed his appreciation for the lectures and training activities conducted through the project. According to him, the sessions helped him recognize different plants and understand their importance, while the distribution of planting materials allowed students to experience actual gardening without the additional expense of purchasing seedlings.

#### **He shared:**

“Ako po si Amerudin Dalandang, isang Grade 10 student ng Nangaan High School. Nakatulong po talaga yung pag-lecture sa amin. Naging aware po kami kung anong mga klaseng halaman at nalaman po namin ang kanilang halaga.”

He particularly appreciated the provision of vegetable and fruit seedlings, which allowed students to immediately apply what they had learned.

“At the same time po, gaya po sa pagbibigay ninyo sa amin ng mga libreng gulay at fruit seedlings, hindi na po kami gumagastos sa pagbili ng halaman. Sobrang grateful po namin na napili po kami ng inyong programa.”

For Amerudin, the project became an important source of practical agricultural knowledge. He learned not only how to identify different plants but also how to properly care for and grow herbs and vegetable crops.

“Ang nagiging impact po ng pagtuturo ninyo sa amin, lalo na sa aming mga estudyante, naging aware kami kung paano ang pamamaraan para palaguin ang mga halaman, tulad ng herb plants at vegetable crops.”

His experience reflects the project's goal of making learning more practical, relevant, and experiential. Instead of merely reading about crop production, students were given the opportunity to handle planting materials, observe plant development, practice gardening techniques, and understand the importance of agriculture in their daily lives.

Through these experiences, Amerudin and his fellow students gained knowledge that they could potentially apply in their homes and share with their families. The project therefore helped transform students from passive recipients of information into active learners and potential advocates of sustainable agriculture and food production.

### **Story 3. Teacher-in-Charge Wency G. Pacheca**

#### ***“Beyond Grateful: The Lasting Impact of the Agri-Extension Program”***

Teacher-in-Charge Wency G. Pacheca of Nangaan High School has been a strong advocate for the development of a scientific and sustainable school garden that can serve as a model not only for the school but also for the surrounding community and neighboring schools.

His vision for the school goes beyond simply establishing a garden. He hopes to develop the area into an educational, environmental, and eventually tourism-oriented site where students and community members can learn about native plants, fruit trees, biodiversity, food production, and environmental conservation.

One of his primary reasons for reaching out to USM was his concern about the declining presence of native fruit trees in the community. He observed that many trees in the surrounding mountains had been cut down and that native fruit species were becoming increasingly difficult to find.

#### **He explained:**

“One reason bakit ako nag-reach out sa USM is the arboretum under Dr. Sumael. The purpose nun is for awareness din kasi na-observe ko po dito sa Nangaan, halos lahat ng bundok dito ay naputol, tapos wala ako nakikita ditong native na mga fruit trees.”

For Teacher Pacheca, the establishment of an arboretum and the planting of native fruit trees could help preserve local plant diversity, provide future sources of seeds and seedlings, and increase community awareness of the importance of trees.

He also connected the initiative to food security and disaster resilience. Having productive fruit trees within the community could provide an additional source of food during emergencies or periods when regular food supplies become limited.

“In case of emergency, lack of food supply, meron mapagkukunan.”

#### **Transforming Community Awareness**

Teacher Pacheca observed a noticeable change in the community's awareness of the plants established through the extension project. Initially, some community members were unfamiliar with the different fruit tree species introduced to the school. As the plants grew and eventually produced fruits, however, people's curiosity and appreciation increased.

#### **He shared:**

“The impact sa community, in the first place hindi nila gaanong kilala yung mga natanim dito na binigay ng agriculture extension activity. Hindi nila kilala yung mga puno dati. Ngayon, nagkakaroon na sila ng knowledge—‘Ah, meron palang ganito dito na ganitong mga klaseng puno.’”

The actual production of fruits became a powerful learning experience. When the trees began producing, students and community members became more interested in the crops and their uses.

“Nung nagbunga na yung mga naitanim na fruit seedlings, at first parang ayaw nila tikman kasi hindi pa nila alam. So nung natikman na, araw-araw na nilang kinukuha ang mga bunga. Minsan wala na kaming ma-harvest, yung mga bata nag-harvest na.”

This experience demonstrated how actual production can change attitudes and generate appreciation for previously unfamiliar plant species. The garden and arboretum became living laboratories where students and community members could directly observe the benefits of planting and conserving trees.

### **Sustaining Knowledge Across Generations**

Teacher Pacheca also emphasized the importance of extension programs in ensuring the continuous transfer of agricultural and environmental knowledge from one generation to another.

“We are thankful din sa extension na ganito. Na-sustain yung transfer of knowledge sa new and next generations, especially sa students. Magkakaroon na ng awareness na need magtanim ng mga puno like fruit trees.”

He believes that when students understand the importance of trees as sources of food and as components of biodiversity conservation, they are more likely to continue these practices in their homes and communities. The project therefore contributes not only to present-day learning but also to intergenerational knowledge transfer and environmental conservation.

The succeeding phase of the project, which focused more extensively on vegetable gardening, further expanded its educational value. According to Teacher Pacheca, the technical expertise provided by USM gave students access to agricultural technologies and practices that they could apply in their own homes.

“Ang magiging impact nito sa mga bata, teach them the technology especially sa planting of vegetables. From USM Agriculture, yung mga expertise nila, matratransfer nila sa mga bata. So ang magiging impact dun, meron na silang knowledge na pwede nilang gamitin sa kanilang bahay.”

He emphasized that students can bring home the knowledge they acquire in school and share it with their parents, thereby creating a multiplier effect in which agricultural knowledge moves from USM experts to teachers, from teachers to students, and from students to their families and communities.

### **Vision for the Future**

Teacher Pacheca's long-term aspiration is to transform the garden and arboretum into a stable educational and community tourism site. He envisions a place where students

can participate in educational trips, visitors can learn about local plant species, and the community can appreciate the value of agriculture, biodiversity, and environmental conservation.

“Ang future plan ko talaga magiging tourism spot siya, sir. I-develop ang area. At least, diyan nila masusunod yung future. Mag-coordinate po kami sa MLGUs para mag-support din sa mga resources. Ang main plan talaga diyan, sir, is gawing tourist spot at the same time educational area na makita kung anong meron diyan.”

This vision highlights the potential of the Plant to Learn Project to evolve from a school-based gardening initiative into a long-term community learning and environmental development program. With continued support from USM, the MLGUs, community stakeholders, parents, and other partners, the site could become a model for sustainable agriculture, biodiversity conservation, environmental education, and community-based learning.

**Teacher Pacheca concluded with his appreciation for the support provided by USM:**

“We are thankful sa USM Extension. Malaking pasasalamat namin, even sa community, sa stakeholders natin, LGU. Kapag tinatanong nila ako, sinasabi ko, extension ito ng USM Agriculture—para rin ito sa atin, sa community.”

**Collective Impact of the Stories**

The experiences of Teacher Bai Dilangalen, Amerudin Dalandang, and Teacher-in-Charge Wency Pacheca collectively demonstrate the transformative and multiplier effects of the Plant to Learn Extension Project. For teachers, the project provided technical knowledge, resources, and confidence to integrate agriculture into teaching and community activities. For students, it transformed agricultural concepts into practical learning experiences that developed knowledge, skills, confidence, and appreciation for sustainable food production. For the community, the project increased awareness of plants, food security, biodiversity, and the importance of environmental conservation.

More importantly, these stories demonstrate that the project's impact does not end within the school garden. Knowledge is transferred from USM experts to teachers, from teachers to students, and from students to their families and communities. Planting materials become productive gardens; training becomes practical knowledge; gardens become living laboratories; and students become advocates for sustainable agriculture.

Ultimately, the stories of Nangaan High School illustrate the central principle of the Plant to Learn Project: when people are given knowledge, resources, opportunities, and the confidence to act, a simple garden can grow into a powerful instrument for education, food security, environmental stewardship, community empowerment, and sustainable development.



*Western Mindanao State University*  
*Satellite Socio-Economic Research and Data Analytics Center*

## **Impact Assessment Report**

### **Plant to Learn**

*Establishment of Vegetable, Herbs, Spices and  
Medicinal Plants; and Forage Garden in Nangaan  
High School*

This is to certify that the impact assessment study titled "**Impact Assessment of the Plant to Learn; Establishment of Vegetable, Herbs, Spices, and Medicinal Plant; and Forage Garden in Nangaan High School**" was conducted and duly certified by the Western Mindanao State University (WMSU) Satellite Socio-Economic Research and Data Analytics Center (SERDAC).

This certification is issued to confirm the validity and integrity of the impact assessment findings and to acknowledge the commitment of WMSU Satellite SERDAC to supporting socioeconomic research for community development.

Certified and conducted by:

  
**ANABEL GAMOREZ, PhD**  
Center Head  
WMSU Satellite SERDAC

