

## Strengthening Farmers' Skills in Sustainable Land Management in Marga Cinta Village, Moramo District, South Konawe Regency

<sup>1</sup>Sahindomi Bana, <sup>1</sup>La Ode Muhammad Erif\*, <sup>1</sup>Emma Hermawati Garusu, <sup>1</sup>Wa Ode Nanang Trisna Dewi, <sup>1</sup>Wa Ode Hastiani Fahidu, <sup>1</sup>Al Firman

<sup>1</sup>Universitas Halu Oleo, Indonesia

\*Corresponding author

E-mail: [laodemuhammad.erif@uho.ac.id](mailto:laodemuhammad.erif@uho.ac.id)

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### Abstract

**Purpose:** Conventional farming practices that rely heavily on inorganic fertilizers have contributed to soil degradation and declining land productivity in many rural areas. This community service program was implemented to strengthen farmers' capacity in adopting sustainable land-management practices that restore soil health and support long-term agricultural productivity.

**Method:** The program employed contextual agricultural extension combined with Focus Group Discussions (FGDs) to explore farmers' perceptions, challenges, and existing practices. This was followed by an intensive two-month coaching period involving weekly field visits, hands-on training, and collaborative development of Standard Operating Procedures (SOPs) and group action plans for sustainable land management. The final stage consisted of systematic monitoring and evaluation to assess skill acquisition, behavioral change, and adoption levels among partner farmer groups.

**Practical Applications:** The program facilitated the joint production and application of organic fertilizer using locally available crop residues. This activity served as both a practical demonstration of sustainable nutrient management and an alternative to residue burning, which commonly contributes to soil degradation.

**Conclusion:** Findings show that many farmers lacked knowledge regarding soil quality, particularly the role of organic matter in maintaining soil fertility. Through capacity building, hands-on training, and participatory learning, the program successfully enhanced farmers' awareness, skills, and commitment to improving soil health. The results indicate that strengthened ecological literacy can support the transition toward more sustainable and productive farming systems within the partner community.



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## **Introduction**

Agriculture is a central pillar of rural livelihoods in Indonesia, including in South Konawe Regency where Marga Cinta Village relies heavily on rice, maize, and horticultural crops as major sources of income. However, agricultural development in the region faces increasing pressure from land conversion, declining soil fertility, and farming practices that have not fully adopted sustainable land-management principles. These challenges reflect broader national concerns in which unsupervised intensification and expansion into non-agricultural uses have contributed to soil degradation and reduced long-term land productivity (Yonariza, 2024).

Environmental issues such as erosion, declining organic matter, and localized climate stress further weaken the resilience of farming systems. As highlighted by Hammada (2024), Indonesia's agricultural landscape is experiencing ecological stress due to excessive reliance on chemical inputs and insufficient application of soil and water conservation techniques. This condition elevates the vulnerability of farming communities—including those in Marga Cinta—to productivity loss, crop failure, and environmental degradation. Supporting this concern, Mongabay Indonesia (2016) reports that accelerating land degradation and farmland conversion threaten national food security and the sustainability of rural agricultural livelihoods.

At the global level, the Food and Agriculture Organization (FAO, 2017) emphasizes that sustainable land management is essential to addressing emerging agricultural challenges, particularly in developing regions. FAO notes that practices such as organic matter enhancement, soil conservation, crop diversification, and climate-adaptive farming techniques play a critical role in increasing productivity while maintaining ecological integrity. These international insights reinforce the need for community-level interventions that can translate scientific knowledge into practical action.

Given these circumstances, strengthening the capacity of farmer groups has become urgent. Farmers in Marga Cinta require accessible, context-specific training on sustainable land management techniques, including organic fertilizer application, soil conservation measures, and the use of environmentally friendly technologies. This community service program adopts a participatory learning approach, in line with Chambers' (1994) Participatory Rural Appraisal (PRA), which underscores the importance of community involvement, local knowledge, and empowerment in rural development. Through participatory methods, farmers are encouraged not only to learn new techniques but also to reflect on local problems, identify relevant solutions, and engage collectively in sustainable practices.

Therefore, this program is designed to enhance farmers' knowledge and practical skills through structured extension sessions, hands-on technical training, and field demonstrations. By promoting sustainable land-management practices that improve soil health, reduce environmental degradation, and strengthen resilience to climate variability, the program aims to contribute to long-term agricultural sustainability in Marga Cinta Village.

## **Method**

The implementation of this community service program employed a multi-stage participatory approach designed to strengthen farmers' competencies in sustainable land management. The methodological framework consisted of five major components, as outlined below.

### **1. Focus Group Discussions (FGDs) and Participatory Social Assessment**

FGDs were conducted to obtain an in-depth understanding of the perceptions, challenges, and land-management practices of farmer groups in Marga Cinta Village. Data collection combined structured questionnaires, semi-structured interviews, and group discussions. These sessions explored local cultural norms, traditional farming habits, constraints related to soil fertility and land conservation, and opportunities for cross-sectoral collaboration. This participatory assessment was essential for aligning intervention strategies with local socio-cultural contexts. As emphasized by Tjahjono et al. (2022), community-based

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environmental programs become significantly more effective when grounded in participatory social mapping and stakeholder engagement.

## 2. Contextual Extension Activities (Class–Field Integration)

A contextual extension model was adopted to bridge theoretical knowledge with practical field application. The activities included: a. Short training modules on key thematic areas: land conservation techniques (vegetative and mechanical), Good Agricultural Practices (GAP), Integrated Pest Management (IPM), organic nutrient management, occupational safety (K3), and basic farm business recording. b. Instructional media such as flipcharts, locally produced short videos, and Standard Operating Procedure (SOP) sheets were used to support comprehension and improve farmer engagement.

## 3. Intensive Mentoring (Coaching Clinic Model)

A structured coaching clinic was implemented through bi-weekly visits over a period of 3–4 months. The mentoring approach consisted of: a. On-farm problem solving, where challenges encountered by farmers were addressed collaboratively, including pest outbreaks, soil issues, and water management. b. Farm record-keeping, documenting input use, labor activities, outputs, and changes in land conditions. This mentoring scheme ensured continuous guidance and allowed the program team to monitor progress in real time.

## 4. Development of SOPs and Farmer Group Action Plans

To institutionalize sustainable practices, the program facilitated the formulation of: a. Commodity-specific SOP drafts for priority crops (rice, maize, and horticulture), including seasonal planting calendars and recommended conservation practices. b. Strengthening farmer-group governance, covering role distribution, collective work schedules (gotong royong), and tool-maintenance contribution schemes. These outputs serve as long-term references for farmer groups to improve coordination and maintain practice consistency.

## 5. Monitoring and Evaluation (M&E)

Monitoring and evaluation were carried out using three categories of indicators:

- a. Learning outcomes, measured through pre–post test scores, attendance rates, and the number of SOPs adopted by farmers.
- b. Biophysical indicators, including reduction in visible erosion depth (cm), proxy measurements of increased soil organic matter, and partial improvements in crop productivity.
- c. Sustainability indicators, such as the farmer group's commitment to replicating demonstration plots (demplot) and their willingness to maintain contribution schemes for resource upkeep. This comprehensive M&E framework ensured that program outcomes could be evaluated both quantitatively and qualitatively, reflecting changes in knowledge, behavior, and land conditions.

## Result

The results of the facilitation activities indicate several important dynamics in the land-management practices of farmers in Marga Cinta Village. Several farmers have begun adopting more conservation-oriented cultivation techniques, such as using raised beds (senkedan) for maize production. This method improves water infiltration and reduces soil-erosion risks, particularly on sloping terrain. However, the utilization of post-harvest biomass—especially rice straw—remains suboptimal. Much of the straw is still burned, as farmers perceive burning to be the quickest and most practical method, particularly when economic pressures require them to allocate their time toward immediate income-generating activities. Similarly, despite the availability and potential benefits of organic fertilizers, their adoption remains low due to limited short-term economic incentives and a lack of consistent knowledge on proper composting techniques.

Nevertheless, farmers have demonstrated an increasing awareness of land-productivity sustainability. This is reflected in their initiatives to plant elephant grass and coconut trees

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along riverbanks to reduce soil erosion in riparian areas. Although these efforts are not yet part of an integrated land-conservation strategy, they indicate a growing recognition among farmers of the importance of maintaining soil stability and ecosystem services that support long-term agricultural productivity.

Beyond technical challenges, farmer groups also face structural constraints, particularly in marketing their agricultural products. Several farmers expressed difficulties in selling their rice due to unstable prices and limited market access. Given that the village is located approximately 72 km from Kendari City the nearest major market the cost of transportation reduces profit margins and negatively affects farmers' bargaining positions. These marketing constraints contribute to farmers' continued reliance on short-term, labour-efficient practices such as residue burning, as they struggle to balance production decisions with economic realities. Overall, these findings highlight the need for capacity-building programs that address both technical improvements in sustainable land management, and

and institutional strengthening and market access to enhance farmers' economic resilience. Such a dual approach is essential to support meaningful behavioral and structural changes toward sustainable agriculture in Marga Cinta Village.

## **Discussion**

A sustained commitment to organic fertilizer production has become a crucial component in strengthening sustainable land management within the farmer groups of Marga Cinta Village. Organic fertilizer is not merely an agricultural input; it represents a foundational ecological intervention capable of restoring soil nutrient equilibrium, improving soil structure, and re-establishing the microhabitats of beneficial soil organisms essential for long-term productivity. This is particularly important in areas experiencing soil degradation due to residue burning, excessive tillage, and prolonged dependence on chemical fertilizers.

Findings from the coaching and field facilitation stages indicated that while several farmers have begun applying conservation practices such as constructing senkedan (raised mounds) for maize cultivation utilization of post-harvest biomass remains limited. A substantial proportion of rice straw continues to be burned, reflecting a combination of economic pressures, insufficient technical skills, and entrenched habits. The shift from burning to composting requires not only knowledge transfer but also institutional reinforcement within farmer groups. For this reason, the mandatory integration of organic fertilizer production into the farmer groups' Standard Operating Procedures (SOPs) and seasonal action plans has been strongly recommended.

Strengthening group commitment is a key strategy in ensuring long-term adoption. Through participatory planning, role-sharing, and routine mentoring, farmer groups are encouraged to treat composting as a collective responsibility rather than an optional individual practice. These mechanisms align with the principles of Participatory Rural Appraisal (Chambers, 1994), which emphasize community empowerment, shared learning, and collaborative problem-solving. Furthermore, the two-week interval coaching visits demonstrated that consistent mentoring significantly enhances farmers' confidence and technical accuracy in processing organic materials.

The composting process itself is an effective entry point for building ecological literacy among farmers. During the field sessions, farmers practiced sorting agricultural residues, mixing them with green biomass, adding microbial starter solutions, and sealing the mixture for anaerobic fermentation. These steps foster not only technical competence but also an understanding of ecological cycles—how decomposition supports nutrient recycling, soil regeneration, and reduced dependency on synthetic inputs. The collaborative nature of these activities also strengthened group cohesion, as members worked collectively to gather materials, operate equipment, and monitor fermentation progress.

The documentation below illustrates one of the key activities conducted during the composting process—namely the sealing of organic residue mixtures as part of the

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fermentation stage. This hands-on activity reflects the practical outcomes of the learning process, demonstrating farmers' increasing confidence in adopting sustainable land-management techniques.

*Figure 1.* Community members sealing mixed agricultural residues during the fermentation stage of organic fertilizer production and Participants of the community service program “Strengthening Farmers’ Skills in Sustainable Land Management” pose for a group photo with the implementation team in Marga Cinta Village, Moramo District, South Konawe.



Source: Author's Work, 2025.

Beyond the technical outputs, the continuation of organic fertilizer production signifies broader social and environmental impacts. From a social perspective, the shared labor and decision-making processes foster stronger farmer-group institutions. Environmentally, the transition from burning to composting directly reduces carbon emissions, minimizes air pollution, and contributes to soil health regeneration. Economically, the use of homemade organic fertilizer reduces production costs, enabling farmers to reallocate financial resources to other essential farming operations. When integrated into long-term land-use planning, compost production becomes a strategic pillar for sustainable agriculture. It supports erosion control, enhances water retention capacity, and increases crop resilience to climate variability—outcomes that are critically needed in the face of changing rainfall patterns and increasing climate risks. Thus, organic fertilizer production is not a standalone activity; it is part of a holistic transformation toward sustainable and climate-resilient farming systems in Marga Cinta Village.

## Conclusion

The implementation of the community service program “Strengthening Farmers’ Skills in Sustainable Land Management in Marga Cinta Village, Moramo District, South Konawe Regency” demonstrates that soil quality and long-term land fertility have not yet become central considerations in local farming practices. Farmers tend to prioritize short-term productivity by relying heavily on inorganic fertilizers to boost crop growth, often overlooking the ecological functions of soil and the long-term sustainability of their agricultural land. Through a series of extension activities, group discussions, and field demonstrations, this program successfully increased farmers’ awareness of the consequences of soil degradation resulting from excessive inorganic fertilizer use. Participants gained a deeper understanding that continuous chemical dependency can damage soil structure, reduce organic matter, and disrupt microhabitats essential for optimal plant growth. This insight strengthened their commitment to adopting organic-based soil management practices, including the fermentation of crop residues to produce organic fertilizer as a sustainable source of nutrients.

Furthermore, the program encouraged farmers to apply simple yet effective soil conservation measures—such as maintaining elephant grass stands and removing dry coconut leaves along riverbanks—to minimize erosion and enhance nutrient retention in

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riparian areas. These collective actions contribute to improved soil stability and long-term ecosystem resilience. Overall, the program not only enhanced farmers' technical knowledge but also fostered ecological awareness and collective responsibility toward sustainable land management. The outcomes highlight the potential for behavioral change and strengthened farmer-group capacity in advancing environmentally sound and climate-resilient agricultural practices in Marga Cinta Village.

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