UNIVERSITAS MUHAMMADIYAH SIDENRENG RAPPANG

SUSTAINABLE DEVELOPMENT GOALS

# SDG 12
# Responsible Consumption and Production
## Progress Report 2025

*Universitas Muhammadiyah Sidenreng Rappang*

Reporting period 1 January to 31 December 2025
Prepared 29 October 2026

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

*Konsumsi dan Produksi yang Bertanggung Jawab untuk Lingkungan yang Lebih Berkelanjutan*

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## Executive overview

UMS Rappang's documented work in 2025 connects resource-use education with practical approaches to using agricultural and household residues. This report presents six activity accounts and a research publication. The cases cover banana-peel product development, community training, school outreach, organic-waste bioconversion, order-based food production and environmental programme evaluation.

| Contribution | Evidence covered |
|---|---|
| Using residual materials | Banana-peel products and flour research, together with BSF organic-waste training |
| Education and community practice | Nasyiatul Aisyiyah training, school outreach and PBL environmental evaluation |
| Production planning | Student snack-box production based on customer orders |
| Research dissemination | A 2025 publication on drying conditions for banana-peel flour; the underlying experiment took place in 2024 |

### Purpose and main finding

The sources establish educational provision, reported product development and published research. They do not establish a verified university-wide waste reduction, recycling rate, material footprint or sustainable procurement result. Five authentic source photographs accompany the illustrated cases, with clickable evidence links throughout. The community training account and research publication are supported by direct source links.

### Reporting status

The activity reporting year is 2025. This report was prepared in 2026 and requires institutional review before publication. Its preparation does not demonstrate that a sustainability report was released during 2025.

# Scope and evidence approach

The review draws on official university news, a contemporary external news account and research articles with identified UMS Rappang involvement. Hosting an article in a university journal does not by itself establish university authorship; affiliations were checked for the research included here. The report is a selection of evidence, not a complete operational audit.

## Evidence rules

1. Separate an activity date, a news publication date and a research publication year. Research conducted earlier is identified explicitly.
2. Describe product development and demonstrations separately from commercial operation or sustained household use.
3. Treat zero waste in a project title as an approach or aspiration, not proof that no residual waste was generated.
4. Distinguish quantities generated, collected, reused, biologically processed and disposed of; do not assign figures where measurement is absent.
5. Keep participant counts within their activity and unit. A training attendance total is not a count of operating enterprises or households adopting a method.

## Relationship to SDG 12

The mapping below interprets the relevance of the evidence to the UN target directions. It does not demonstrate attainment of national or global indicators. [09]

| Target direction | Relevance and reporting boundary |
|---|---|
| 12.2 Efficient resource use | Residue-based product development explores material use, without measuring a material footprint. |
| 12.3 Food loss and waste | Order-based production offers a prevention pathway; food losses and waste were not quantified. |
| 12.5 Prevention reuse and recycling | Banana-peel utilisation and organic processing support this direction; no annual recycling rate is established. |
| 12.8 Awareness and education | Community and school learning are directly relevant, while curriculum-wide integration requires additional records. |
| 12.4 12.6 and 12.7 | Chemicals management, reporting and procurement need institutional policies and implementation evidence beyond these activities. |

The report does not assert that all fruit peels are avoidable food waste or count every utilisation method as recycling. Classification should follow a consistent institutional method. All links were reviewed on 29 October 2026.

# Community training on banana peel products

*UMS Rappang and Nasyiatul Aisyiyah Sidenreng Rappang | News published 24 February 2025*

## Reported activity and university role

Pelopornews reports a UMS Rappang LP3M and PKM Risetmu training programme with Nasyiatul Aisyiyah Sidenreng Rappang. The team included Astrina Nur Inayah, Bahtiar Herman and Muhammad Aksan. Participants practised processing banana peels into products such as muffins, dodol and ice cream, and presented their product ideas. The stated aim combined awareness of residual-material use with product development. [01]

## Related research publication

A related 2025 SOLMA article by UMS Rappang authors describes work with the same community organisation on banana-peel innovation and digital empowerment. Its abstract reports 30 participants and a two-day sequence covering product practice, digital marketing, branding and packaging. This is a programme-level publication account; its participants are not added to a separate total inferred from the news report. [08]

## Documented contribution

The evidence supports training and practical experimentation with residual materials. This is relevant to targets 12.5 and 12.8. The project's zero-waste terminology does not establish a measured diversion rate, zero residual disposal or a verified increase in household income.

| Stage | What should be verified |
|---|---|
| Training | Delivery records, attendance and demonstrated practical skills. |
| Continued use | Whether participants repeat the process after training and with what inputs. |
| Environmental result | Measured quantities and a clearly documented alternative disposal route. |

## Evaluation and supporting records

Retain the programme report, materials, attendance and partner confirmation. Follow-up should record input quantities, products, residual material and operating costs. A wider environmental assessment should consider energy, water and packaging rather than assume that using one residue guarantees an overall benefit. Product suitability requires appropriate testing and is not established by the news description.

# Student innovation using banana residues

*Agribusiness and Government Studies collaboration | News published 11 February 2025*

## Activity and university contribution

UMS Rappang students developed banana-based products through business risk, feasibility and entrepreneurship coursework. The account identifies collaboration between Agribusiness and Government Studies students and describes banana-peel chips alongside dried banana products. Product development included considering the banana type, taste and texture and adapting product flavours. [02]

**Figure 1. Photograph accompanying the university report on student banana-product innovation.**

## Documented contribution and SDG relevance

The report documents practical product development using material ordinarily treated as a residue. It supports resource-use learning and the waste-reduction direction of target 12.5. It does not provide production volumes, a material balance, validated product safety or evidence of continuing commercial sales.

## Evaluation and supporting records

Evaluation should distinguish a recipe or course prototype from a repeatable production process. Record how the peel is sourced, what proportion is used and what residues remain. Assess yield, consistency and acceptability alongside the resources used in processing. No nutritional or health benefit is inferred here.

Retain course briefs, product specifications, process records and assessment rubrics. Any statement of waste avoided needs a baseline and input records. Commercial claims require actual transaction and cost records, while product safety and storage suitability require appropriate validation.

# School outreach on waste utilisation

*Agricultural Product Technology and other science programmes | Activity 25 February 2025*

## Activity and university contribution

The university's Agricultural Product Technology programme introduced waste-processing and utilisation concepts during a food-related outreach activity for SMA 9 Pinrang learners. The article, published on 26 February 2025, reports participation by 40 students and lecturers from several Faculty of Science and Technology programmes. The stated focus was awareness of methods that can turn residual material into useful products. [03]

**Figure 2. Photograph accompanying the university news account of outreach on waste processing and utilisation.**

## Documented contribution and SDG relevance

The evidence establishes an outreach session and an activity-specific learner count. Its main contribution is awareness and information under target 12.8. The source does not establish students' subsequent behaviour, a school waste-management system or measured changes in knowledge.

## Evaluation and supporting records

A useful follow-up would ask learners to identify materials, explain suitable utilisation routes and distinguish prevention from later treatment. Assessment could use a short practical task rather than attendance alone. Continued use in school learning should be confirmed through teachers and dated examples.

Retain the school confirmation, attendance, teaching materials and any assessment. If learners later develop projects, record their inputs and results independently. Do not use 40 students as a university-wide beneficiary total or assume the session reduced school waste without measurement.

# Introducing BSF organic waste processing

*Fisheries programme community service in Kulo | News published 29 July 2025*

## Activity and university contribution

A UMS Rappang team led by Muhammad Bibin introduced Black Soldier Fly larval cultivation to Kulo residents. The source describes instruction on preparing enclosures, maintaining larvae and harvesting. Household food and vegetable residues were presented as inputs, with larvae and residual material discussed as potential feed and organic-fertiliser products. [04]

**Figure 3. Photograph accompanying the university report on BSF bioconversion training in Kulo.**

## Documented contribution and SDG relevance

The documented contribution is community training in a biological processing method. It is relevant to resource recovery and waste-management education. Strong benefit statements in the news are not treated as measured reductions in disposal, verified earnings or confirmed environmental gains.

## Evaluation and supporting records

Evaluation should establish whether routine processing occurred after the training. Record inputs, outputs and residues over the same period, and identify the source and final use of materials. Include maintenance, location and operational suitability in the follow-up. A demonstration batch should be kept separate from ongoing service data.

Retain training and partner records, operating guidance and follow-up observations. Measure quantities before claiming diversion, and avoid counting both inputs and products as separate amounts of waste treated. Product quality, suitability and economic returns need separate verification.

# Planning food production around confirmed demand

*Culinary Arts Education student entrepreneurship | News published 21 April 2025*

## Activity and university contribution

Culinary students developed a snack-box service through an entrepreneurship course. The university account describes producing against customer orders for campus seminars and training, with menu and budget options adapted to each event. The project connected culinary skills with management and business communication. [05]

**Figure 4. Photograph accompanying the university report on the student snack-box production project.**

## Documented contribution and SDG relevance

The evidence establishes a reported order-based service model. It has a plausible connection to preventing overproduction and therefore to target 12.3. The source provides no measured food-waste baseline, comparison with batch production or quantified reduction in costs or discarded food.

## Evaluation and supporting records

Assessment should compare planned portions, actual orders, production, delivery and leftovers. Customer-order production may still generate preparation waste and unused ingredients, so those flows should be recorded separately. Packaging is also part of the production system and should be assessed alongside food quantities.

Retain order forms, menus, purchasing and production logs, delivery records and waste measurements. Compare similar events and explain differences in attendance or menus. Food-waste prevention should be reported only when supported by consistent measurements rather than by the service model alone.

# Evaluating household and school environmental activities

*Health Administration PBL 3 in Enrekang | News published 6 February 2025*

## Activity and university contribution

Health Administration students completed a two-week PBL 3 placement in Taulan and Karrang villages, Cendana. The source describes evaluation of earlier PBL 2 activities involving household waste, environmental management, school clean and healthy living practices and crafts using discarded plastic cups. [06]

**Figure 5. Photograph accompanying the university report on completion of the PBL 3 environmental evaluation placement.**

## Documented contribution and SDG relevance

The evidenced output is a field evaluation exercise. It supports attention to continuity of waste-related education and reuse practices. The article does not supply evaluation instruments, sample sizes, measured findings or a quantified change in household disposal.

## Evaluation and supporting records

Earlier intervention delivery should not automatically be counted as new 2025 activity because it was reviewed during PBL 3. Establish the original intervention dates and report the 2025 evaluation separately. Reuse crafts should be assessed for continued use, material quantities and final disposal rather than assumed to eliminate plastic waste.

Retain the field report, placement records, baseline and follow-up instruments, observations and village feedback. Findings should identify location, indicator and denominator. Distinguish awareness, actual practice and measured material outcomes, and recognise other contributors to any observed change.

# Research publication on banana peel flour

*JASATHP Volume 5 Number 2 November 2025 pages 94 to 102*

## Publication and research scope

A 2025 article by Minarsi Amir, Rukmelia and Andi Nurwidah identifies UMS Rappang Agricultural Product Technology affiliations and examines drying conditions for kepok banana-peel flour. The experiment compared drying at 60 and 70 degrees Celsius for five and six hours, with four treatment combinations and three repetitions. Observed characteristics included yield, moisture, ash and iron. [07]

## Important distinction in the reporting year

The methods section dates the experiment to August–September 2024. Its inclusion in this report is therefore as a research dissemination output published in 2025, not as a newly conducted 2025 experiment. It is not combined with the student food projects as a single intervention.

## Contribution to responsible production

The study contributes process knowledge about using a fruit-processing residue. Its relevance is the investigation of material characteristics that may support further development. The article does not establish commercial adoption, a full life-cycle benefit, campus waste diversion or a quantified reduction in food loss.

| Research stage | Further evidence for application |
|---|---|
| Laboratory process comparison | Raw results, test methods and reproducibility checks. |
| Product development | Formulation, suitable quality and safety assessment, and storage performance. |
| Practical adoption | User trials, costs, resource inputs, production records and sustained use. |

## Evaluation and evidence quality

Technical findings should be interpreted within the tested conditions. A processing study is not sufficient to calculate environmental savings: drying energy, water, additional ingredients and packaging also matter. Any institutional efficiency claim would require measured inputs per unit of useful output and a defined comparator.

Retain the publication, underlying research records where available and subsequent application evidence. Check numerical and treatment labels against the original dataset before using them in external performance claims. This report does not reproduce uncertain headline treatment results as institutional achievements.

# Institutional operations and responsible purchasing

A full SDG 12 report should connect academic activity with the university's own consumption, procurement and waste systems. The selected sources provide useful activity evidence but do not establish a complete campus operational baseline.

| Area | Records needed for a complete account |
|---|---|
| Material consumption | Purchasing quantities, covered sites, reporting period and relevant categories of materials. |
| Waste generation and destinations | Measured waste by stream, weighing method, collection records, recipient confirmation and final treatment route. |
| Food operations | Food procurement, meals or portions served, preparation residues and leftovers using consistent definitions. |
| Hazardous materials and waste | Inventories, responsible persons, procedures, storage and documented transfer arrangements. |
| Reusable and disposable products | Relevant purchasing rules, implementation records and evidence of actual product substitution. |
| Supplier and procurement practice | Approved criteria, tender or purchasing records, supplier information and documented decisions. |
| Sustainability reporting | An approved reporting boundary, data owners, review arrangements and actual publication dates. |

## Operational claims require implementation evidence

A policy states expectations; records show how it was applied. The review should assess both. No campus-wide ban, waste contractor arrangement, zero-waste certification or sustainable purchasing compliance is asserted here. Absence from the reviewed public news is a reporting gap rather than proof that provision is absent.

## Resource use beyond a single waste stream

Assess the whole process when considering a product's benefit. Reusing a residue can require extra energy, water or packaging. A balanced account should make the trade-offs visible and use measured comparisons where available. Proposed improvements should be presented as recommendations until formally adopted and implemented.

# Measurement framework and evidence gaps

The following measures are proposed for institutional validation. They are not approved targets or measured 2025 results. Six activity accounts and one publication describe this report's scope, rather than an annual total of programmes or beneficiaries.

| Measure | Definition and verification | Current evidence position |
|---|---|---|
| Waste generated | Mass by stream over a defined period, with the covered sites and measurement method. | No campus-wide 2025 total verified |
| Material utilised | Recorded input of a defined residue and useful output, with residual losses kept separate. | Product and training accounts exist; quantities unverified |
| Food waste | Measured preparation and post-service waste, using stated boundaries and appropriate activity denominators. | No comparative result established |
| Sustained practice | Distinct participants or partners continuing a method at a specified follow-up. | Not consolidated |
| Educational reach | Activity-specific attendance separate from demonstrated knowledge or skills. | 40 school learners reported in one outreach case |
| Research output | Affiliation-verified publication year distinguished from the date of underlying research. | 2025 flour publication verified; experiment in 2024 |
| Responsible purchasing | Decisions meeting approved criteria, supported by actual procurement records. | Institutional data needed |
| Controlled handling | Waste records linked to verified receiving and treatment arrangements, by material type. | Not established by the activity sources |

## Material accounting

A simple activity log should record the date, material source, input mass, useful product, remaining residue and destination. State whether weights are wet or dry when that distinction affects interpretation. Avoid adding recovered products to processed inputs as though they represent separate waste streams.

## Assessing improvement

Use comparable observation periods and explain changes in the number of meals, students or production batches. A lower absolute quantity may reflect reduced activity rather than better practice. Where data are incomplete, describe coverage and uncertainty instead of assigning missing values a zero.

# Recommended actions and institutional review

These recommendations describe how the university could strengthen implementation evidence and evaluate results. They are proposals for institutional consideration, not approved commitments or activities already completed.

| Priority | Proposed action | Suggested coordinating function |
|---|---|---|
| Validate activity accounts | Confirm dates, delivery, participant records and university roles with programme owners and partners. | Academic programmes and community service coordination |
| Follow up residue utilisation | Check continued practice and record inputs, outputs, operating costs and residual disposal. | Project teams and community partners |
| Measure food production | Use purchasing, order and production records with direct measurements of food residues. | Relevant culinary and food-service activities |
| Create an operational baseline | Consolidate campus material and waste streams using consistent boundaries and methods. | Facilities and relevant administrative functions |
| Review purchasing evidence | Assemble approved criteria and records demonstrating their use. | Procurement and management functions |
| Approve public reporting | Review accuracy and image permissions, reconcile dates and publish with the actual release date. | Institutional leadership and SDG reporting coordination |

## Evidence package

For each case, retain the brief, assignment or agreement, attendance or partner confirmation, materials, dated photographs and outputs. Where savings or environmental benefits are claimed, add measurements and explain the comparison. Publication records should identify affiliations and both the study and publication dates where they differ.

## Overall assessment

The selected evidence demonstrates practical learning and community engagement with residual-material use and production planning. It supports a traceable activity account for SDG 12. Stronger progress claims would require measured material flows, sustained partner use and evidence about the university's own operational practices.

## Approval and publication

Responsible units should verify their accounts before approval. A public release should identify its reporting period, actual release date and approved version. Any later evidence or correction should preserve the original dates and state the basis for the updated claim.

# Evidence and photograph register

Original source titles are retained for retrieval. All links were reviewed on 29 October 2026. Figures 1 to 5 correspond to source pages [02] to [06].

[01] Mengubah Limbah Menjadi Produk Bernilai Pelatihan Pengolahan Pengembangan Produk Zero Waste dari Kulit Pisang. Pelopornews, 24 February 2025. Read evidence

[02] Mahasiswa UMS Rappang Ciptakan Inovasi Kuliner Unik dari Pisang. UMS Rappang website, 11 February 2025. Read evidence

[03] Program Studi THP Fakultas Sains dan Teknologi UMS Rappang. UMS Rappang website, 26 February 2025. Read evidence

[04] Dosen Ilmu Perikanan UMS Rappang Perkenalkan Teknologi Biokonversi Sampah Organik dengan Maggot BSF. UMS Rappang website, 29 July 2025. Read evidence

[05] Snack Box on Demand Strategi Cerdas Mahasiswa Kuliner UMS Rappang. UMS Rappang website, 21 April 2025. Read evidence

[06] Penarikan Mahasiswa Prodi Administrasi Kesehatan UMS Rappang Usai Jalani PBL3 di Enrekang. UMS Rappang website, 6 February 2025. Read evidence

[07] Minarsi Amir, Rukmelia and Andi Nurwidah. Pengaruh Suhu dan Waktu Pengeringan Pembuatan Tepung Kulit Pisang Kepok. JASATHP 5(2), November 2025, 94–102. Original article PDF

[08] Astrina Nur Inayah and co-authors. Inovasi Produk Kulit Pisang Berbasis Zero Waste sebagai upaya Pemberdayaan Digital di Komunitas Nasyiatul Aisyiyah Sidenreng Rappang. Jurnal SOLMA 14(2), 2025, 2624–2641. Article PDF

[09] United Nations Department of Economic and Social Affairs. Goal 12 targets and indicators

## Photograph provenance and source credits

Five photographs are reproduced from the images attached to source pages [02] to [06]. They illustrate the reported activity and do not independently verify participation, product suitability or environmental benefits. The photographs embedded in the external community-training news page were unavailable during preparation and are not reproduced. No replacement activity images were generated.

University pages credit external news reporting including Ajatappareng Online for the student banana products, Pelopornews for school outreach and PBL, InfoBuzzPress for BSF training and TOPNEWS1 for the snack-box activity. Preserve credits and confirm permissions for public image reuse. Retain dated evidence copies because online sources may change.