GRADUATE SCHOOL

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Master of Science in Animal Science

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Below is a sample of the Extension Program of the Graduate Students where the Sustainability Plan is embedded

Community Engagement Proposal: “Grass into Gains: Promoting Silage Production for Livelihood and Livestock Development”

A Project of the Graduate Students of the Department of Animal Science

Rationale

Livestock production in the Philippines faces recurring challenges in feed availability and rising costs, particularly during the dry season and periods of limited pasture growth. Silage production provides a practical, cost-efficient, and sustainable solution to ensure a year-round supply of high-quality forage. Training farmers, livestock raisers, extension workers, and agricultural students on silage production techniques will strengthen local livestock industries by improving feed security, reducing waste of surplus forage, and enhancing productivity.

Objectives

- Introduce participants to the principles, importance, and benefits of silage in livestock feeding systems.
- Demonstrate different silage production techniques (e.g., chopped Napier grass, corn, legumes, and crop residues).
- Provide hands-on training on silage preparation, packing, sealing, and storage.
- Familiarize participants with quality assessment, nutritive value, and utilization of silage in ruminant diets.
- Promote sustainable feed resource management and income-generating opportunities for farmer-cooperatives and MSMEs.

Target Participants

- Farmers and livestock raisers
- Members of cooperatives/associations
- Agricultural extension workers and technicians
- Students and faculty in agriculture/animal science

Training Methodologies

- Lectures & Presentations: Principles of silage, nutritional importance, and economics.
- Demonstrations: Step-by-step preparation of silage using local feed resources.
- Hands-On Practice: Chopping, mixing, packing, and sealing silage in drums, plastic bags, and pits.
- Group Discussions: Sharing of experiences and best practices in feed preservation.
- Evaluation & Feedback: Assessing knowledge gained and areas of improvement.

Proposed Topics

1. Introduction to Silage Production – Importance, advantages vs. hay, and limitations.

2. Raw Materials for Silage – Suitable forages, grasses, legumes, crop residues.

3. Principles of Ensiling – Fermentation process, role of lactic acid bacteria, moisture requirements.

4. Silage Preparation Techniques – Field harvesting, chopping, wilting, additives (molasses, LAB inoculants).

5. Silage Storage Structures – Plastic bags, drums, pits, bunkers.

6. Silage Quality Evaluation – Physical appearance, smell, pH, proximate analysis.

7. Feeding Management – Incorporation of silage in ruminant diets.

8. Cost-Benefit Analysis – Economics of silage making vs. commercial feeds.

Duration and Venue

Duration: 1–2 days (flexible depending on depth of training) per batch

Venue: University demonstration farm / cooperative training center / local barangay hall with nearby forage area

Expected Outputs

- Participants equipped with knowledge and skills in silage production.
- At least one silage product prepared during training (demo silage in drums or bags).
- Strengthened community capacity in feed resource conservation.
- Potential enterprises on silage production for cooperatives/MSMEs.

Budgetary Requirements (Sample Estimate)

Item	Quantity	Estimated Cost (PHP)
Training kits (modules, pen, notebook)	30 pax	6,000
Honorarium for resource speakers	2 speakers	10,000
Food and snacks	30 pax x 2 days	18,000

Materials (plastic drums, bags, molasses, forage crops, LAB inoculant)	Lump sum	12,000
Venue, logistics & documentation	Lump sum	5,000
Total Estimated Cost		51,000

Implementing Agency & Partners

Lead Organizer: University / Extension Office / Regional Agribusiness Hub

Partners: DA, DOST-PCAARRD, LGUs, farmer cooperatives, private agribusiness stakeholders

Monitoring & Evaluation

- Pre- and post-training evaluation questionnaires
- Documentation of hands-on activities
- Feedback from participants and trainers
- Follow-up survey on application of silage techniques in farms within 3–6 months

Sustainability Plan

Grass into Gains: Promoting Silage Production for Livelihood and

Livestock Development

1. Purpose

The sustainability plan ensures that the knowledge, skills, networks, and resources generated through the project continue to benefit farmers, cooperatives, and partner institutions beyond the initial implementation. It provides mechanisms for continuity, scaling up, and integration of silage production into long-term livestock and livelihood systems.

2. Strategic Objectives

- Institutionalize Silage Training and Knowledge Transfer through continuous capacity-building programs led by USM and partner agencies.
- Strengthen Farmer Associations and Cooperatives as the primary drivers of silage production and enterprise.
- Ensure Resource Availability by supporting access to forage seeds, inoculants, and silage-making equipment.
- Develop Sustainable Market Linkages for silage products to secure income streams for producers.
- Integrate Project Outcomes into Policy and Programs of LGUs and SUCs to guarantee long-term support.

3. Key Strategies

A. Capacity Building and Human Resource Development

- Conduct regular re-echo trainings led by trained farmers, extension workers, and USM students.
- Integrate silage-making modules into USM's academic curriculum and LGU extension programs.
- Develop "train-the-trainer" programs to expand the pool of local experts.

B. Institutionalization and Partnerships

- Establish a Silage Production Support Hub at USM to provide technical guidance, demonstration sites, and resource materials.
- Forge long-term partnerships with LGUs, DA, FAO, KOICA, and private feed companies to provide technical and financial support.
- Encourage memorandums of agreement (MOA) between USM, farmer cooperatives, and LGUs for continuous collaboration.

C. Enterprise and Market Development

- Support farmer associations like KARLIFA in scaling silage into a community-based enterprise.
- Develop value chains: production, packaging, branding, and distribution of silage products.
- Facilitate market linkages with dairy cooperatives, goat raisers, and cattle producers.
- Explore pricing models and collective marketing to improve competitiveness (e.g., PHP 6/kg benchmark from KARLIFA).

D. Resource Mobilization

- Pursue funding opportunities from government programs (DA, DOST-PCAARRD, LGUs) and international donors (FAO, KOICA).
- Promote cost-sharing schemes where farmers contribute labor and forage, while LGUs and cooperatives provide equipment or materials.
- Encourage income reinvestment from silage sales into cooperative funds for equipment maintenance and expansion.

E. Monitoring, Evaluation, and Learning (MEL)

- Establish a community-based monitoring system to track silage adoption, livestock performance, and income gains.
- Conduct annual impact assessments with USM students as part of their research-extension integration.
- Create a digital knowledge repository (manuals, videos, success stories) accessible to stakeholders.

4. Implementation Framework

Pillar	**Lead Actors**	**Support Partners**	**Timeframe**
Training & Re-echo	USM Faculty & Graduate Students	LGUs, DA Extension, Farmer-Trainers	Continuous (Yearly)
Enterprise Development	Farmer Associations (e.g., KARLIFA)	KOICA, FAO, Cooperatives	1–3 years
Policy Integration	LGUs, SUC Leadership	Regional Agri Councils, DA	2–5 years
Resource Mobilization	Farmer Groups & USM	Donors, Private Sector	Annual Proposal Cycle

Monitoring & Evaluation	USM & Cooperative Leaders	LGUs, Students	Annual Review

5. Risk Management

- Adoption Risks: Some farmers may revert to traditional feeding due to lack of motivation → Mitigation: incentives through cooperative-led enterprises and peer mentorship.
- Market Risks: Unstable demand or pricing → Mitigation: diversify markets (dairy, beef, goat raisers) and promote collective bargaining.
- Resource Constraints: Limited forage or inoculants → Mitigation: establish forage nurseries and promote local LAB inoculant production at USM.
- Institutional Risks: Weak partnerships over time → Mitigation: formalize agreements and integrate silage into official LGU programs.

6. Exit and Continuity Plan

- The project transitions from being USM-led to farmer association-driven, with USM providing technical backstopping.
- Silage enterprises generate revenue that funds future training, equipment maintenance, and cooperative expansion.
- SUCs and LGUs incorporate silage production into their agricultural extension packages, ensuring it becomes a standard service beyond the life of the project.

Five-Year Sustainability Framework

Grass into Gains: Promoting Silage Production for Livelihood and Livestock Development

Overall Goal

To institutionalize silage production as a sustainable livestock feeding and livelihood strategy by enhancing farmer capacity, strengthening cooperative enterprises, and integrating technology into regional agricultural systems within five years.

Guiding Principles

- Science-based approach – decisions guided by research on forage conservation, silage quality, and livestock performance.
- Community ownership – farmer cooperatives and associations as the primary implementers.
- Institutional collaboration – SUCs, LGUs, and government agencies as support mechanisms.

- Market-driven sustainability – ensuring economic viability through enterprise and value chain development.
- Inclusivity and resilience – equitable participation of men and women, with adaptive strategies for climate variability.

5-Year Phased Framework

Year 1: Foundation and Capacity Building

Focus: Knowledge transfer, skills training, and initial adoption.

- ➢ Train 100 additional farmers, cooperative members, and extension workers through re-echo trainings.
- ➢ Establish 2–3 demonstration sites for Napier + molasses and Corn + LAB inoculant silage.
- ➢ Baseline data collection: feed costs, livestock productivity, farmer income.
- ➢ Develop IEC materials in local dialects; digitize resources for wider reach.

Indicators:

- n 100 new trained individuals.
- n 30% of trained farmers start practicing silage production.
- n 2 demo farms operational.

Year 2: Enterprise Development and Technology Refinement

Focus: Scaling adoption, testing innovations, and strengthening farmer associations.

- ➢ Conduct applied research on locally produced LAB inoculants for silage quality improvement.
- ➢ Pilot-test low-cost silo models (plastic drums, silo bags, pits) adapted to farmer capacity.
- ➢ Support KARLIFA and 1–2 other associations to formalize community-based silage enterprises.
- ➢ Train farmer-leaders as certified trainers for peer-to-peer capacity building.

Indicators:

- n 2 farmer associations selling silage commercially.
- n 50% adoption among Year 1 trainees.
- n Comparative data on silage quality (pH, DM, crude protein) with/without inoculants published in local journals.

Year 3: Market Linkage and Institutional Integration

Focus: Strengthening value chains and embedding silage into agricultural programs.

- ➢ Develop branding and packaging strategies for silage products.
- ➢ Forge supply contracts with dairy, beef, and goat cooperatives.
- ➢ Lobby for inclusion of silage in LGU agricultural extension services and DA regional feed self-sufficiency programs.
- ➢ Scale up production to meet local demand (target: 10–15 MT per month by KARLIFA).

Indicators:

- n At least 3 LGUs integrate silage promotion into extension packages.
- n Cooperative sales of silage reach ₱500,000 annually.
- n Published policy brief on silage integration presented to regional councils.

Year 4: Expansion and Research-Extension Convergence

Focus: Widening adoption, advancing research, and building resilience.

- ➢ Establish forage nurseries (Napier, corn, sorghum) in collaboration with LGUs and SUCs.
- ➢ Integrate silage technology into USM and partner SUCs' animal science curriculum.
- ➢ Conduct farmer-led action research on livestock performance using silage diets.
- ➢ Launch a regional conference on silage and forage innovations.

Indicators:

- n 5 new cooperatives adopting silage enterprise models.
- n 60% increase in livestock productivity among adopters.
- n Research outputs presented in at least 2 national/international scientific fora.

Year 5: Consolidation and Sustainability

Focus: Institutionalization, scaling, and long-term resilience.

- ➢ Establish a Regional Silage Innovation and Resource Center at USM, serving as a hub for training, research, and enterprise incubation.
- ➢ Full integration of silage practices into regional livestock development programs.
- ➢ Expand commercial silage distribution beyond Region XII.
- ➢ Secure long-term partnerships with private feed companies and government agencies.

Indicators:

- n At least 10 farmer associations sustainably producing and marketing silage.
- n Silage adoption among trained farmers reaches 70% or higher.
- n Regional center operational and recognized as a knowledge hub.
- n Farmers report ≥25% reduction in feed costs and ≥20% increase in net farm income.

Risk Management

- Market saturation → Mitigation: diversify silage products (small bale, pelletized forms).
- Climate variability affecting forage supply → Mitigation: establish drought-tolerant forage varieties and irrigation support.
- Farmer dropout due to cost or labor → Mitigation: cooperative model reduces individual burden.
- Institutional discontinuity → Mitigation: embed silage in LGU ordinances and SUC extension mandates.

Exit and Long-Term Continuity

By the end of Year 5, silage production will be a mainstream practice in livestock raising in Region XII, sustained by:

1. Farmer cooperatives operating as enterprises.
2. LGUs and SUCs providing continuous extension and training.
3. USM-led resource center generating research and innovations.
4. Private sector linkages ensuring steady market demand.