Manure management to improve soil structure & food security and mitigate greenhouse gas emission

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Background
The initial study summarized manure policies from 12 Sub-Saharan African countries. The results indicate that most countries:

a) don't have a stand-alone manure management (MM) policy,

b) have shared responsibility for MM between different ministries which are often incoherent, leading to abnegation of these responsibilities

c) take limited action to promote good manure management practices.

This information aims to support policy makers, researchers, extension workers, farmers, and other stakeholders to understand the importance and common practices of manure management.

What is Integrated Manure Management?
Manure collection
Manure collection is very dependent on livestock housing.

Free range systems: Construct confinement (kraal) to keep animals at night
Clean kraal (i.e. remove manure) as often as possible (at least once a month)

Confined systems: This is a system where the manure is collected within the cowshed

Deep litter systems: These are systems where layers of bedding material are repeatedly spread on older layers as they get soiled

MANURE STORAGE

GOOD MANURE MANAGEMENT

Animal confinement with roof
Possibility to collect both feces and urine
Covering manure to prevent nutrient losses
Using banana leaves or crop residues to cover manure

POOR MANURE MANAGEMENT

Open animal housing
Nutrients are washed away from uncovered manure
Nitrogen is lost to the air from uncovered manure

COMPOSTING MANURE
Composting is the natural process of ‘rotting’ or decomposition of organic matter by microorganisms under aerobic conditions.

1. Choose a shady place in proximity of water
2. Collect composting material (manure, crop residues, fresh and dry grass, top soil, ash, etc.)
3. Cut the plant material to the size of a finger

LAWS OF COMPOSTING
- Add to the compost: Green vegetation
- Avoid adding: Dry vegetation

FIELD APPLICATION
Recommended manure application rates vary according to the type of animal, collection and storage method, available soil nutrient content and the crop cultivated.

General rule: apply two handfuls of solid manure (cattle, goat, sheep, etc.) or one handful of poultry manure per hole/plot for maize

ANAEROBIC DIGESTION
Anaerobic digestion is a biological process that produces biogas

Advantages of using Biogas:
- Saving of expenditures on fuel sources
- Saving time collecting wood
- Increased food production from biodairy
- Reduction in smoke related diseases
- Preservation of forest
- Workload reduction especially for women and children
- Bright light to help in quality education and household works
- Reduction of greenhouse gas emissions

Benefits of Integrated Manure Management
Preserve nutrients: About 70 - 95% of the nutrient intake of production animals is excreted via dung and urine.

Protect health and safety: prevent transmission of zoonotic diseases that be transmitted through manure.

Reduce detrimental environmental effects: Poor manure handling leads to higher greenhouse gas emissions and pollution of ground and surface water.

Economic viability: Good manure management > better organic fertilizer > less synthetic fertilizers > lower production costs.

Capturing methane as biogas provides cooking fuel and lighting that can replace firewood and charcoal.

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Nutrient cycles in crop-livestock systems
Good manure management gives a better fertilizer hence higher crop yields.