A picture showing goats closer in their feeding area next to the housing units (Priscilla Vivian Kyosaba)

Semi-Intensive Goat Farming Practice for Pasture Conservation (Uganda)

Okulisa embuzi

DESCRIPTION

Goats are stall fed during dry season and open-grazed during rain season. In a semi-intensive system, animals are kept under confinement in which they are stall–fed for some period of time (weeks to months, especially during the dry seasons) followed by another period of open grazing during the rainy seasons.

The semi-intensive goat rearing practice is a compromise between extensive and intensive grazing systems limited by shortage of pasture during dry seasons with high chances of spreading diseases requiring for stall feeding goats in an semi-intensive system. The goats are kept under confinement for some period of time (weeks to months, especially during the dry seasons). During dry season, the animals are fed on maize bran; iodized salt; peelings from banana, cassava, and sweet potatoes; and improved grasses (Napier) and forages planted at the boundaries of the banana plantation, which are harvested during the period of need.
The farmer has got 2 ha of banana plantation. She grows a fodder hybrid called Napier (pennisetum perpureum) around the plantation to be used as fodder for the goats during dry season. Napier grass is a perennial grass fodder commonly called elephant Grass due to its tallness and vigorous vegetative growth. She got the Napier root cuttings from the neighbor practicing the same technology. This is grown around the banana plantation, at a spacing of 60×60cm. It produces more tillers with soft and juicy stem, free from pest and diseases and non-lodging. It can be cultivated throughout the year. Napier grasses contain 6-8% protein. Its optimum cutting interval is about 6 to 8 weeks at grass range of 60 to 90 cm, if sufficient only the tops can be cut and fed. The grass is cut into 5 to 10 cm to reduce loses.
The extensive system is practiced during rainy season where the farmer grows a mixture of fodder species including Sesbania and Napier grass grown on land size of 0.5 ha. Sesbania is a fast-growing tree with regular and rounded leaves. The flowers are white and red in color according to its species but the ones at the farm are yellow. The leaves of Sesbania trees are highly palatable and mostly liked by goats. The protein content in this is about 25%. 1kg of seed was planted at a spacing of 100 cm x 100 cm. In this field Napier grass is planted in rows at a spacing of 60×60cm. The seeds for Sesbania were supplied to the farmer by the Kabarole District Production Office.
Farmers in Kabarole District use the Semi-intensive system for rearing both local and improved breeds of goats. As dry spells are increasingly becoming common, this technology helps farmers to go through the dry season with enough feed for the goats. Farmers prefer rearing goats because they don't have complicated feeding and medical requirements. As the human population grows and land fragmentation increases, farmers in this area are now moving towards intensive feedings systems.
Throughout seasons of abundant forage, farmers harvest the forage together with grasses and make hay to feed the goats during the dry season when pastures are scarce. The cost of harvesting the hay is comparable to the cost of paying a herdsman in open grazing systems. Besides, the establishment of the shelter for goats is not cumbersome compared to those of other animals. The constructed structure occupies an area of about 12 ×12 meters squared with length of 10 meters and width is 3 meters. It is lifted ground to floor 1.5 meters and floor to roof by 2.5 meters. Further partitioned in 4 units and each unit measurement is 3 meters with a slope angle of 20 degrees. The Capacity of each unit is 18,17,17 and 18 goats respectively.
The shelter for the goats is made from relatively cheap materials that are readily available to the farmers. The farmer rears 70 goats on 1-acre piece of land using this technology. By planting improved forages in the grazing areas, the farmer receives increased amount of forage harvested as well as the quality of grass available to the goats during the open grazing periods and income after sale.One challenge of this technology is the dependence on family labor that is not always sufficient for all the tasks involved in the technology both at establishment and maintenance in addition to complications with of rural-urban migration of youth, thereby leaving the workload to the elderly.

LOCATION

Location: Western Region, Uganda

No. of Technology sites analysed: single site

Geo-reference of selected sites
- 30.236, 0.473

Spread of the Technology: evenly spread over an area (approx. < 0.1 km2 (10 ha))

Date of implementation: 1960

Type of introduction
- ☐ through land users' innovation
- ☑ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☐ through projects/ external interventions

A photo showing goats close to their feeding area in Kabarole District, Western Uganda (Priscilla Vivian Kyosaba)

A photo showing grazing pasture field for the goats during rain season (Priscilla Vivian Kyosaba)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- [x] improve production
- [ ] reduce, prevent, restore land degradation
- [ ] conserve ecosystem
- [ ] protect a watershed/ downstream areas – in combination with other Technologies
- [ ] preserve/ improve biodiversity
- [ ] reduce risk of disasters
- [ ] adapt to climate change/ extremes and its impacts
- [ ] mitigate climate change and its impacts
- [x] create beneficial economic impact
- [ ] create beneficial social impact
- [x] Prevention of diseases

Land use

Grazing land - Intensive grazing/ fodder production: Cut-and-carry/ zero grazing, Improved pastures
Main animal species and products: It is a mixture of cross and local breed and the main product aimed for is meat

Water supply

- [x] rainfed
- [ ] mixed rainfed-irrigated
- [ ] full irrigation

Number of growing seasons per year: n.a.
Land use before implementation of the Technology: n.a.
Livestock density: The farmer has got 70 goats, the number of animals per each constructed unit is variable. She constructed 1 unit, partitioned into 4 sections measuring to 3×3 meters each accommodating 15 goats.

Purpose related to land degradation

- [x] prevent land degradation
- [ ] reduce land degradation
- [ ] restore/ rehabilitate severely degraded land
- [ ] adapt to land degradation
- [ ] not applicable

Degradation addressed

physical soil deterioration - Pc: compaction

biological degradation - Bc: reduction of vegetation cover

SLM group

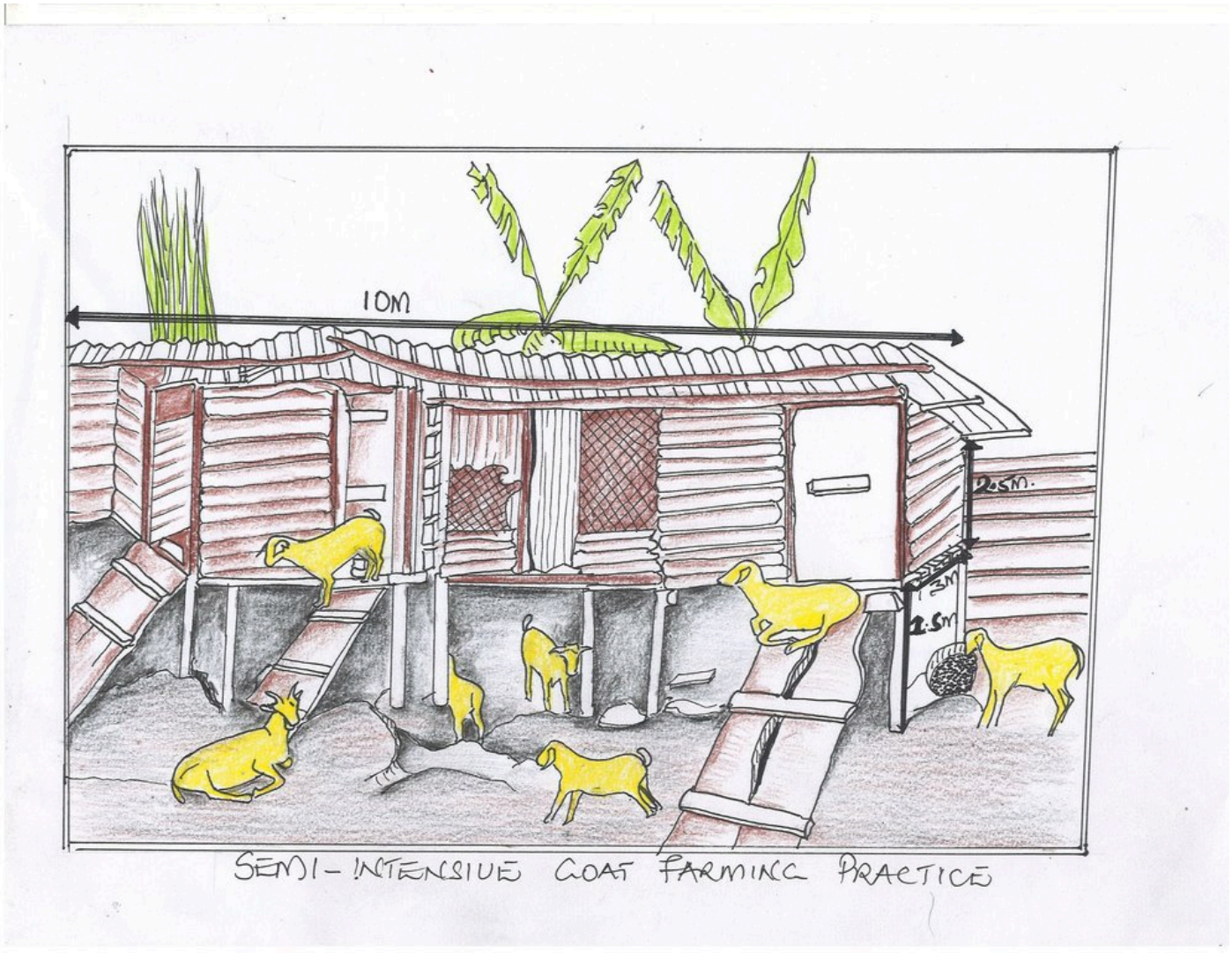
- pastoralism and grazing land management
- improved plant varieties/ animal breeds

SLM measures

structural measures - S9: Shelters for plants and animals

TECHNICAL DRAWING

Technical specifications



Author: Prossy Kaheru
It is an elevated floor housing unit with 10 X 3 meters squared with a height of 2.5m.
From ground it is elevated 1.5 m. The structure is partitioned into 4 units
The Capacity of each unit is 18,17,17 and 18 goats respectively.
Construction materials are timber peelings, iron sheets, nails.
Animal species are both crosses and local breeds.

Author: Prossy Kaheru

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology unit (unit: **Per shelter as described**)
- Currency used for cost calculation: **shillings**
- Exchange rate (to USD): 1 USD = 3650.0 shillings
- Average wage cost of hired labour per day: 25,000

Most important factors affecting the costs

The organisaton and purchase of feedstuff

Establishment activities
1. Constructing animal shelter (Timing/ frequency: Once)
2. Buying kids (Timing/ frequency: Once)

Establishment inputs and costs (per Per shelter as described)

Specify input	Unit	Quantity	Costs per Unit (shillings)	Total costs per input (shillings)	% of costs borne by land users
Labour					
Animal housing Structure construction labor	Man days	2.0	25000.0	50000.0	100.0
Buying kids	Kids	20.0	20000.0	400000.0	100.0
Equipment					
Poles		35.0	7000.0	245000.0	100.0
Iron sheets		50.0	21000.0	1050000.0	100.0
Nails	Kilograms	30.0	3000.0	90000.0	100.0
Ropes		20.0	1000.0	20000.0	100.0
Plant material					
Unit doors		5.0	25000.0	125000.0	100.0
Total costs for establishment of the Technology				**1'980'000.0**	

Maintenance activities
1. Acquiring animal feeds (Timing/ frequency: Everyday)
2. Animal water (Timing/ frequency: Everyday)
3. De_worming the animals (Timing/ frequency: After 2 months)
4. Buying iodine salt to mix in animal feed (Timing/ frequency: When needed)
5. Repairing damaged patches of the animal shelter (Timing/ frequency: When needed)
6. Cleaning the animal housing (Timing/ frequency: Daily)
7. Giving feeds to the goats (Timing/ frequency: Daily)

Maintenance inputs and costs (per Per shelter as described)

Specify input	Unit	Quantity	Costs per Unit (shillings)	Total costs per input (shillings)	% of costs borne by land users
Labour					
Animal Vaccine	Bottles	2.0	25000.0	50000.0	100.0
Iodine salt	Kilograms	360.0	800.0	288000.0	100.0
Labor					100.0
Other					
Stocking animal feeds	Bundles	1300.0	500.0	650000.0	100.0
Total costs for maintenance of the Technology				**988'000.0**	

NATURAL ENVIRONMENT

Average annual rainfall
- [ ] < 250 mm
- [ ] 251-500 mm
- [ ] 501-750 mm
- [ ] 751-1,000 mm
- [ ] 1,001-1,500 mm
- [ ] 1,501-2,000 mm
- [x] 2,001-3,000 mm
- [ ] 3,001-4,000 mm
- [ ] > 4,000 mm

Agro-climatic zone
- [x] humid
- [ ] sub-humid
- [ ] semi-arid
- [ ] arid

Specifications on climate
Average annual rainfall in mm: 2000.0

Slope
- [ ] flat (0-2%)
- [ ] gentle (3-5%)
- [ ] moderate (6-10%)
- [ ] rolling (11-15%)
- [x] hilly (16-30%)
- [ ] steep (31-60%)
- [ ] very steep (>60%)

Landforms
- [ ] plateau/plains
- [ ] ridges
- [x] mountain slopes
- [ ] hill slopes
- [ ] footslopes
- [ ] valley floors

Altitude
- [ ] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [x] 1,501-2,000 m a.s.l.
- [x] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [ ] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

Technology is applied in
- [ ] convex situations
- [x] concave situations
- [ ] not relevant

Soil depth
- [ ] very shallow (0-20 cm)
- [ ] shallow (21-50 cm)
- [x] moderately deep (51-80 cm)
- [ ] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)
- [ ] coarse/ light (sandy)
- [x] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Soil texture (> 20 cm below surface)
- [ ] coarse/ light (sandy)
- [x] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Topsoil organic matter content
- [x] high (>3%)
- [ ] medium (1-3%)
- [ ] low (<1%)

Groundwater table

Availability of surface water

Water quality (untreated)

Is salinity a problem?

- [ ] on surface
- [ ] < 5 m
- [ ] 5-50 m
- [x] > 50 m

- [ ] excess
- [x] good
- [ ] medium
- [ ] poor/ none

- [x] good drinking water
- [ ] poor drinking water (treatment required)
- [ ] for agricultural use only (irrigation)
- [ ] unusable

- [ ] Yes
- [x] No

Occurrence of flooding
- [ ] Yes
- [x] No

Species diversity
- [x] high
- [ ] medium
- [ ] low

Habitat diversity
- [ ] high
- [x] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [ ] subsistence (self-supply)
- [x] mixed (subsistence/ commercial
- [ ] commercial/ market

Off-farm income
- [x] less than 10% of all income
- [ ] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [ ] poor
- [x] average
- [ ] rich
- [ ] very rich

Level of mechanization
- [x] manual work
- [ ] animal traction
- [ ] mechanized/ motorized

Sedentary or nomadic
- [x] Sedentary
- [ ] Semi-nomadic
- [ ] Nomadic

Individuals or groups
- [x] individual/ household
- [ ] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [x] women
- [ ] men

Age
- [x] children
- [ ] youth
- [ ] middle-aged
- [x] elderly

Area used per household
- [ ] < 0.5 ha
- [ ] 0.5-1 ha
- [ ] 1-2 ha
- [ ] 2-5 ha
- [x] 5-15 ha
- [ ] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [x] small-scale
- [ ] medium-scale
- [ ] large-scale

Land ownership
- [ ] state
- [ ] company
- [ ] communal/ village
- [ ] group
- [ ] individual, not titled
- [x] individual, titled

Land use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [x] individual

Water use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [x] individual

Access to services and infrastructure

health	poor	good
education	poor	good
technical assistance	poor	good
employment (e.g. off-farm)	poor	good
markets	poor	good
energy	poor	good
roads and transport	poor	good
drinking water and sanitation	poor	good
financial services	poor	good

IMPACTS

Socio-economic impacts

farm income

decreased — increased

Reason given is that a farmer can now comfortably pay children school fees plus take-care of the family necessities

workload

increased — decreased

Cut and carry method requires much labor

Socio-cultural impacts

food security/ self-sufficiency

reduced — improved

Manure collected from the goats shelter is piled and later applied in the garden hence increasing crop yields

Ecological impacts

Off-site impacts

damage on neighbours' fields

increased — reduced

Goats confined.

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative	very positive
Long-term returns	very negative	very positive

Benefits compared with maintenance costs

Short-term returns	very negative	very positive
Long-term returns	very negative	very positive

CLIMATE CHANGE

Gradual climate change

annual temperature decrease	not well at all	very well	
seasonal temperature decrease	not well at all	very well	Season: wet/ rainy season
annual rainfall decrease	not well at all	very well	
seasonal rainfall decrease	not well at all	very well	Season: wet/ rainy season

Climate-related extremes (disasters)

insect/ worm infestation	not well at all	very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- [ ] single cases/ experimental
- [x] 1-10%
- [ ] 10-50%
- [ ] more than 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- [x] 0-10%
- [ ] 10-50%
- [ ] 50-90%
- [ ] 90-100%

Has the Technology been modified recently to adapt to changing conditions?

- [ ] Yes
- [x] No

To which changing conditions?

- [ ] climatic change/ extremes
- [ ] changing markets
- [ ] labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Improved standards of living because of the incomes generated.
- Animal manure acquired and then applied in the farmers banana plantation
- Serves as employment opportunity for the youths in the home.

Strengths: compiler’s or other key resource person’s view

- Easy access for feeding and watering
- Nutrient requirement are met both from grazing and stall feeding.

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

- Relatively expensive to maintain
- Vaccinating every after two months a bit tiresome
- In dry season they usually face a problem of water scarcity

Weaknesses/ disadvantages/ risks: compiler’s or other key resource person’s viewhow to overcome

- Stall feeding relatively increases the feeding cost Supplementing stall feeding with grazing and pasture growing
- Management and knowledge of forage storage is needed Through training on forage management

REFERENCES

Compiler
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Resource persons
Edith Tusiime - land user

Full description in the WOCAT database
https://qcat.wocat.net/en/wocat/technologies/view/technologies_3363/
Video: https://player.vimeo.com/video/261314072

Linked SLM data
n.a.

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Links to relevant information which is available online
- Commercial Goat Farming in India: An Emerging Agri-Business Opportunity: http://ageconsearch.umn.edu/bitstream/47443/2/7-Shelanderkumar.pdf
- Expert System for sheep and goat: http://agritech.tnau.ac.in/expert_system/sheepgoat/Housing%20of%20sheep%20and%20goats.html