Prop Used to Support Banana Plant with Heavy Bunches Against Wind and Goats and Cattle Pens where Animals are Kept for Manure Supply (Jasson Rwazo (P.O.BOX 38 Missenyi Tanzania))

Improved Kibanja cropping system ( )

Ekibanja ekiine emikolele emirungi (Haya/Nyambo)

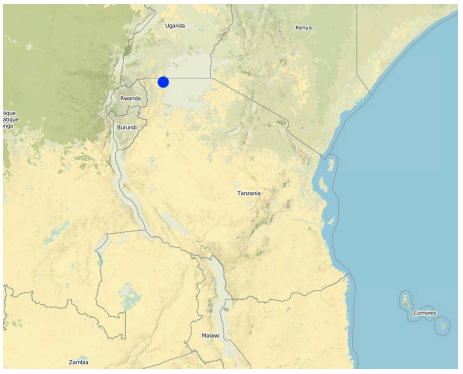
This is a traditional banana and coffee complex cropping system interplanted with annual crops, trees,shrubs, vegetables and other diverse plants of social economic importance.

Improved traditional multi-cropping system that combines banana and coffee as main crops planted in a specific spacing to optimize plant stands. Banana and coffee are intercropped with; 1. annuals crops: Maize, beans, yams, coco-yams;2. Vegetables: Lycoperscum esculentum, Amaranthus spp, Cucumis communis and Solanum aethopium ;3. Shrubs of social economic value. Trees (e.g Maesopsis eminii, Makhcamia lutea, Ricinus comunis, Ficus thorninghii) and shrubs (Dracaena usambarensis) are planted on the farm edge. These serve as live fence, wind breaker, source of timber, fuel wood, medicine and protect the field against erosion. To optimize farm production, application of 15cm thick mulch (grass mulch and banana prunnings), farmyard or compost manure and interplanting with soil fertility and/or soil moisture improvement trees are ensured. With problems of climate change, water harvesting ditches and trenches are constructed. Water harvesting ditches are constructed to collect water from micro catchments like roads or homestead. Sustainability of the Improved Kibanja system has always been assured through crop/livestock integration approaches.The cropping system is typical in high rainfall areas along foot slopes, valley bottoms or hilltops preferably on fertile and deep soils.

Purpose of the Technology: The purpose is improve soil fertility,moisture, controlling soil erosion (wind and water) and suppressing weeds in order to improve the production banana, coffee and other inter planted crops.

Establishment / maintenance activities and inputs: Establishment activities: 1. Land clearing and preparation: Slashing, uprooting tree stumps, ploughing and pitting 60cm x 90cm banana hole and 60cm x 60cm coffee (Mid June to August) using simple farm implements; 2.Farm Yard Manure application: 60 Kg per banana holes and 36 Kg per coffee hole (August to early September); 2. Planting: 308 banana suckers at 3.6m x 8m spacing, 830 coffee seedlings at 3m x 8m spacing in alternating row, edge row trees seedling at 10m spacing and 15cm spacing for shrubs e.g. Dracaena usambarensis (September to November);4. Excavation of water retention structure (after planting mainly in Novermber). Full establishment of Improved Kibanja cropping system can be attained in three years.
Maintenance activities:1. Weeding:Done two times per year (mid January to February / July to augost) before planting annual crops; 2.FYM enrichment: Every after 3 years; iii. banana dethrashing and desuckering ,topping mulch, coffee pruning and harvesting (Immediately after weeding); 4. Other maintenence activities: Disease control (nematode, banana weevils, Banana Xanthamonas Wilt) and Propping (using pole to support banana plant with heavy bunches against wind); 5.Inputs: Labour, farmyard manure, propping poles, mulch; 6. Simple farm implements:Hand hoe,machete and wheel barrow.

Natural / human environment: The technology is implemented in mixed land use type under sub humid condition receiving 1000-1500mm of rains per year. A combination of soil and water improvement measures (FYM application, Mulching, water retention ditches and live fencing) complement each other to minimize risk of crop failure and hence improve production. The slope is gentle to moderate , soil depth is moderate and soil texture loam. Simple hand tools are traditional used,Land ownership is individual not titled. Application of this technology determined by high establishment and maintenence cost.



: Missenyi District, Kyazi Village, Tanzania,

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- 31.63752, -1.19527

: (approx. < 0.1 2 (10))

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: 10 ( )

(> 50)

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Cattle Pens where Animals are Kept for Manure Supply in Banana Farm at Kyazi (Jasson Rwazo (P.O.BOX 38 Missenyi Tanzania))

Grass mulch (Iwona Piechowiak (iwona.piechowiak@yahoo.co.uk))

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- improve soil fertility

/ - Agro-pastoralism ( )

- : - , Lycoperscum esculentum, Amaranthus spp, Cucumis communis and Solanum aethopium
- ( ): /plantain/abaca
- : , Orange, Paw paw, Maesopsis eminii, Makhcamia lutea, Ricinus comunis, Ficus thorninghii, Dracaena usambarensis
- Ficus thoninji,Markhamia lutea,Maesopesis eminii

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- Wt:

- Cn: ( )

- Bc:

SLM

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SLM

- A2: /

- V1: , V2: 2

- S4:

- Manure is most determinate factor high transportation cost especially during establishment
- ( ) 1 USD =
- 1

1. Land clearing and preparation:Slashing,uprooting tree stumps, ploughing and pitting (/ : June to August)
2. Availing and applying 54 tone Farm Yard (/ : August to early September)
3. Planting: 308 banana suckers 830 coffee and tree edge low tree seedlings (/ : From September)
4. Construction of water harvesting ditches (/ : Once year)

			( )	( )	%
Land clearing	persons/day	202,0	1,18316	239,0	100,0
Construction of water harvesting ditches	persons/day	4,0	0,937	3,75	100,0
Tools	ha	1,0	61,56	61,56	100,0
Seedlings	pieces	1138,0	0,0468	53,26	100,0
Manure	tons	54,0	34,7222	1875,0	
Cuttings	ha	1,0	2234,6	2234,6	100,0
				4'467.17	
				4'467.17	

1. Topping grass mulch (/ : 3 times per year)
2. Farm yard manure enrichment (/ : 2 times per year)
3. Removal of sediments and debris in water retention ditches. (/ : Every year)
4. To replacement propping Poles (/ : Every 1.5 year)
5. To corve transportation cost (/ : Manure)
6. Replacement of propping pole and live hedges (/ : Every 1.5 year)
7. Removal of sediments and debris in water retention ditches (/ : Once per year)

			( )	( )	%
Topping grass mulch	persons/day	10,0	4,101	41,01	100,0
Applying FYM	persons/day	10,0	3,906	39,06	100,0
Removal of sediments	persons/day	4,0	0,9375	3,75	100,0
To replacement propping Poles	persons/day/ha	10,0	3,906	39,06	100,0
Tools	per ha	4,0	1,875	7,5	100,0
Farm yard manure	tons	20,833	46,8	974,98	100,0
Wood	pieces/ha	600,0	0,625	375,0	100,0
Mulching material	bundle	300,0	1,875	562,5	100,0
Transportation	trips	19,0	61,673	1171,79	100,0
				3'214.65	

	3'214.65	

< 250
251-500
501-750
751-1,000
✓ 1,001-1,500
1,501-2,000
2,001-3,000
3,001-4,000
> 4,000

✓

Avarage rainfall 1200mm, Bimode rainfall, 5 month dry season

Thermal climate class: tropics. Annual temperature 23C

Length of growing period 120 -300 days

(0-2%)
✓ (3-5%)
✓ (6-10%)
(11-15%)
(16-30%)
(31-60%)
(>60%)

✓
✓

0-100
101-500
501-1,000
✓ 1,001-1,500
1,501-2,000
2,001-2,500
2,501-3,000
3,001-4,000
> 4,000

✓

(0-20)
✓ (21-50)
✓ (51-80)
(81-120)
(> 120)

( )
✓ (,)
/ ( )

(> 20)
/ ( )
(,)
/ ( )

(>3%)
✓ (1-3%)
(<1%)

< 5
5-50
✓ > 50

✓
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(
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✓
( )
( )

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✓

SLM

( )
✓
(/
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✓ 10%
10-50%
50%

✓

✓
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✓
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✓
(,
)

✓ < 0.5
0.5-1
1-2
2-5
5-15
15-50
50-100

✓

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100-500
500-1,000
1,000-10,000
> 10,000

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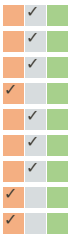

SLM: 50
SLM: 300
Bunch of banana with 70 kg each

Depend mainly on banana sell

SLM: 1875 $
SLM: 1406 $

SLM: 6250
SLM: 25000
Annual income in dollar

Solery depend on farm

Reduced weeding, but technology is labour intensive.

/

SLM: 1000
SLM: 4000
Increase in bunch of banana produde annually

SLM: 5
SLM: 2
Frequency of attedndence to hospital due to edequate food supply

SLM /

Adoption by neighbouring farmers

( )

SLM: 0
SLM: 10
Due to water harvesting dithchers along the foot path in the farm

Due to the use of mulch and corver crops

Due to corver crop and mulch

Use of banana trash mulch and other corver crops

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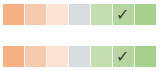
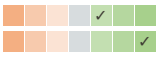
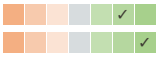
Due to mulching material

(-springs)







Depending on regular application of manure and mulch plus good management of the farm

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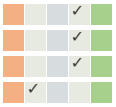

/

1-10%
11-50%
✓ > 50%

?

0-10%
11-50%
51-90%
✓ 91-100%

/

317 households (70 percent of all land users in the area)

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?

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( )

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- Increased house hold food security and income

  How can they be sustained / enhanced? Schedule regular maintenance activities

:

- Soil moisture conservation

  How can they be sustained / enhanced? Maintenance of water harvesting ditches and replacement of mulching materials
- Soil fertility improvement

  How can they be sustained / enhanced? Regular application of manure and mulch
- Improvement of soil structure and aeration

/ / :

/ / :

- High labour and capital demand Phase in implementation and regular maintenance of the technology
- High risk of fire Use of fire breaks

How can they be sustained / enhanced? Manure and mulch application

- Control of soil erosion

How can they be sustained / enhanced? Maintenance of plant cover and water retention ditches, manure and mulch application

Editors

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: 5 2012 : 6 2019

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Elizabeth Kitundu - Government

https://qcat.wocat.net/km/wocat/technologies/view/technologies_1183/

SLM

Approaches: Integrated farm knowledge adoption https://qcat.wocat.net/km/wocat/approaches/view/approaches_2677/

- Food and Agriculture Organization of the United Nations (FAO) -
- Missenyi District Council (Missenyi District Council) -

- The Transboundary Agro-ecosystem Management Project for the Kagera River Basin (GEF-FAO / Kagera TAMP)

- Improving Productivity of Field Crops and Post Harvest Management in North west Tanzania,United Republic of Tanzania Ministry of Agriculture, Food and Cooperatives,2008:

- Kagera TAMP project website: http://www.fao.org/nr/kagera/en/