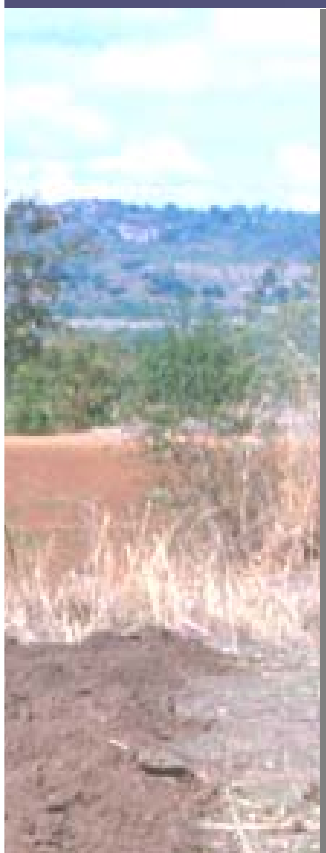
Deutscher Tropentag 2002 Subgroup 3b

Managing Agro-Biodiversity

Successful Female Farmers as Environmental Agents
A Human-Ecological Case Study in Kenya and Tanzania

Anja Blume



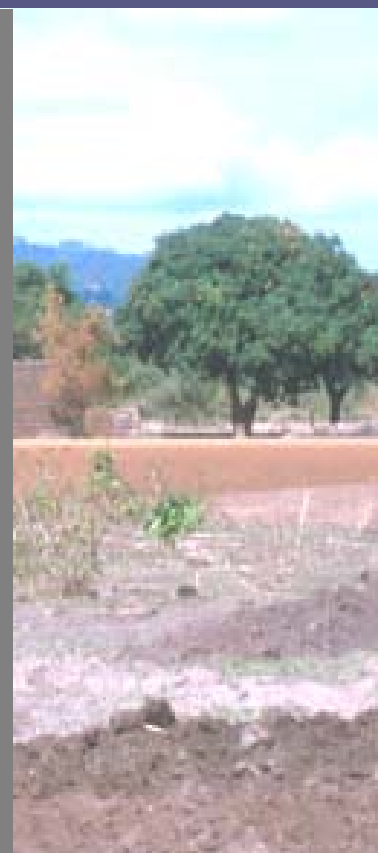
STRUCTURE

1 Approach

2 Farmer's strategies

3 Success indicators

4 Summary and outlook



1 Approach

Selection criteria

- **2 countries** in a similar ecological & socio-cultural region

→ **Tanzania & Kenya** → **compariso n** + **experience**

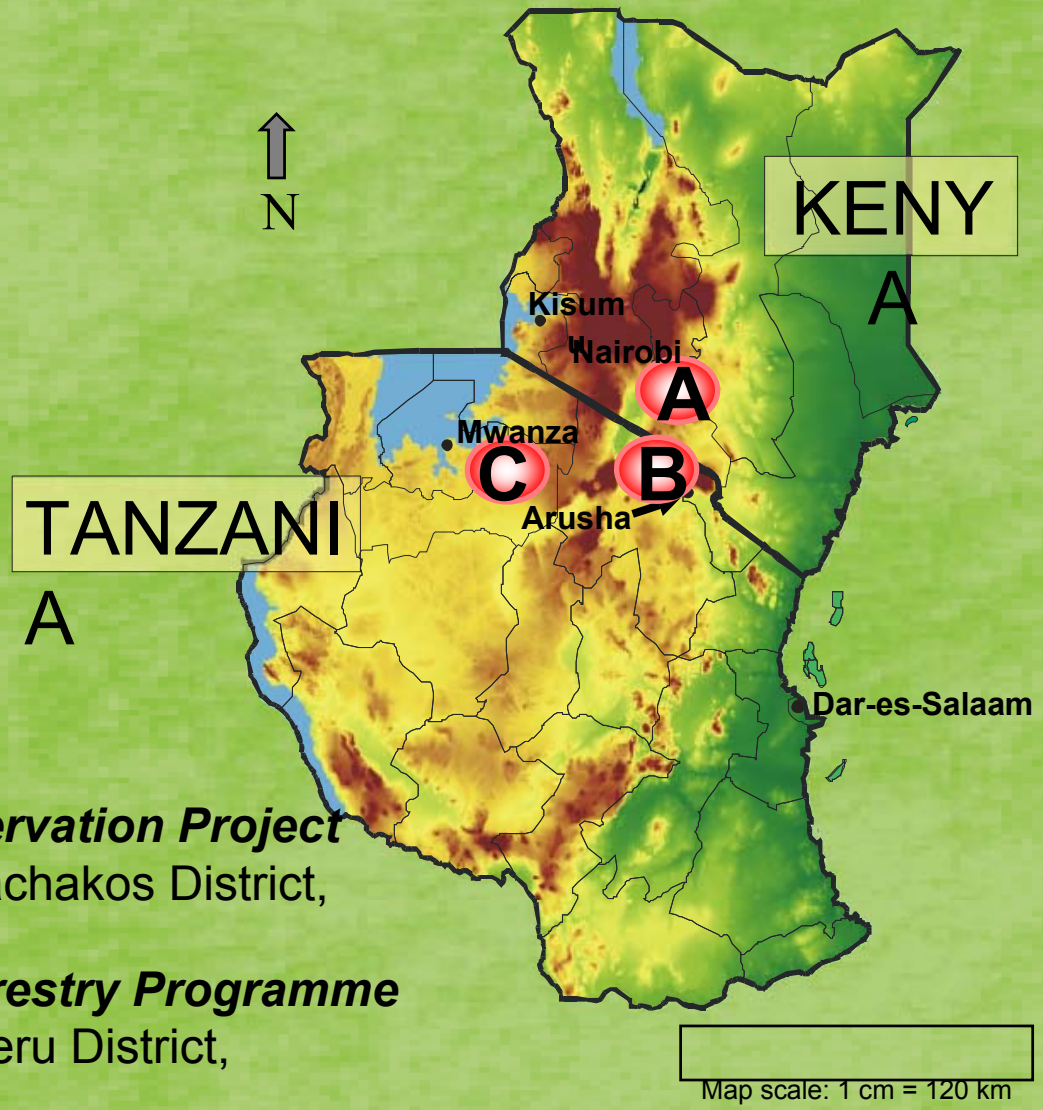
- **3 projects** → **compariso n**

- based upon **participatory approach**

- sensitive to **gender issues**

- integration of **environmental sound technologies**

The project/research areas



A ***National Soil and Water Conservation Project*** (NSWCP), Eastern Province, Machakos District, Kenya

B ***Soil Conservation and Agroforestry Programme*** (SCAPA), Arusha Region, Arumeru District, Tanzania

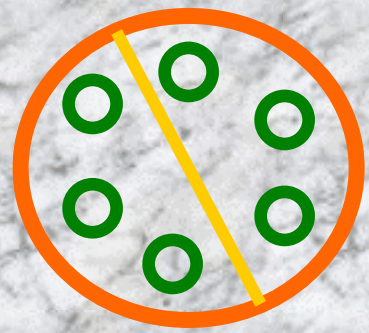
C ***Hifadhi Ardhi Shinyanga Agroforestry Research Project*** (HASHI-ICRAF), Shinyanga Region, Shinyanga & Kahama Districts, Tanzania

Selection criteria

18 smallholder farms in total

- **10** men-headed households
- **8** female-headed households

6 per project area



2 agroecological zones

- **low potential area**
- **mid/high potential area**

comparison

Successful female farmers

Group linkage

?

?

?

Female-headed households

- Why are they successful?
- What is their position within the development context?
- What is the difference between male-headed and female-headed households?

‘multiplicator-effect’?

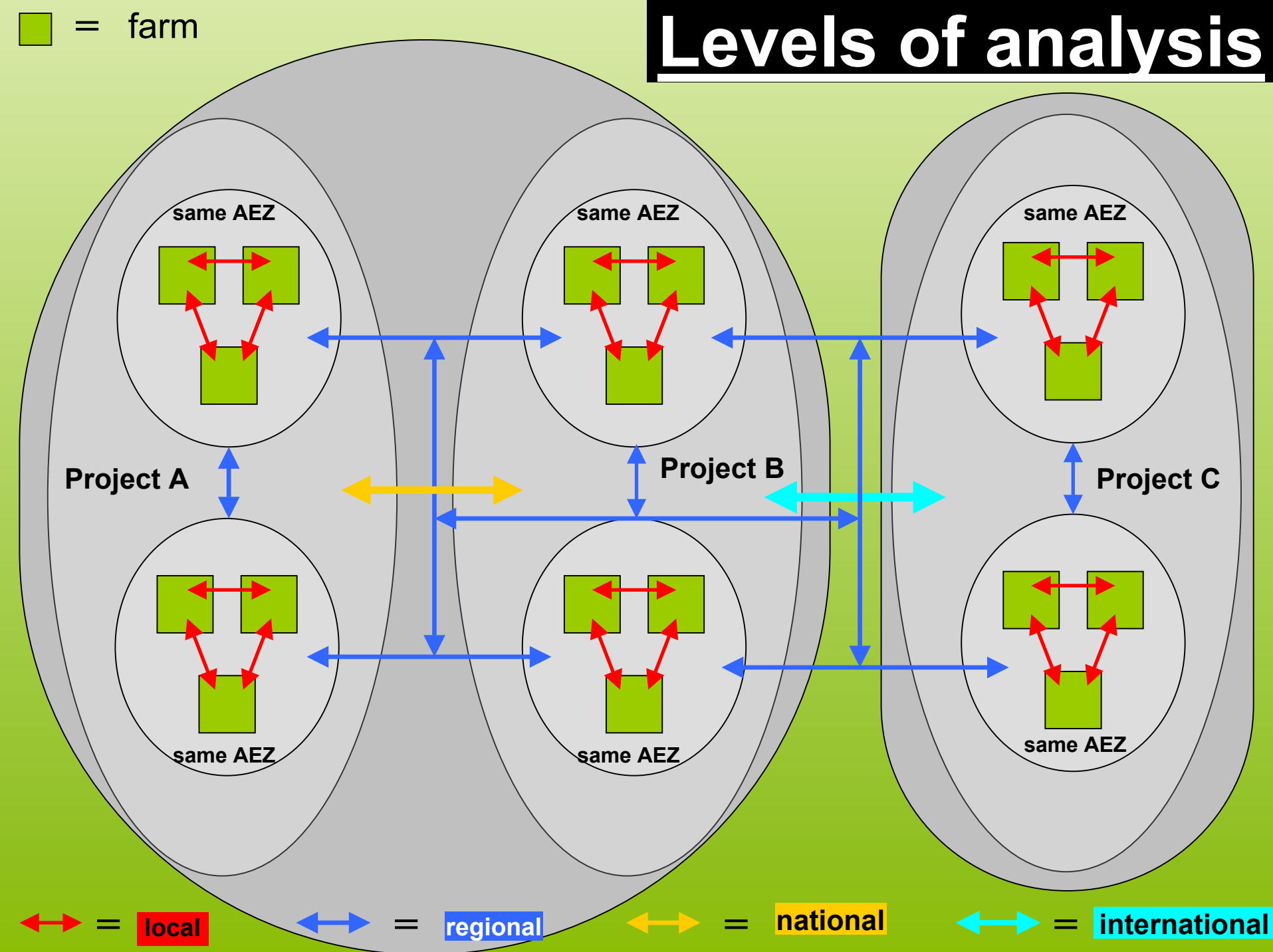
key persons?

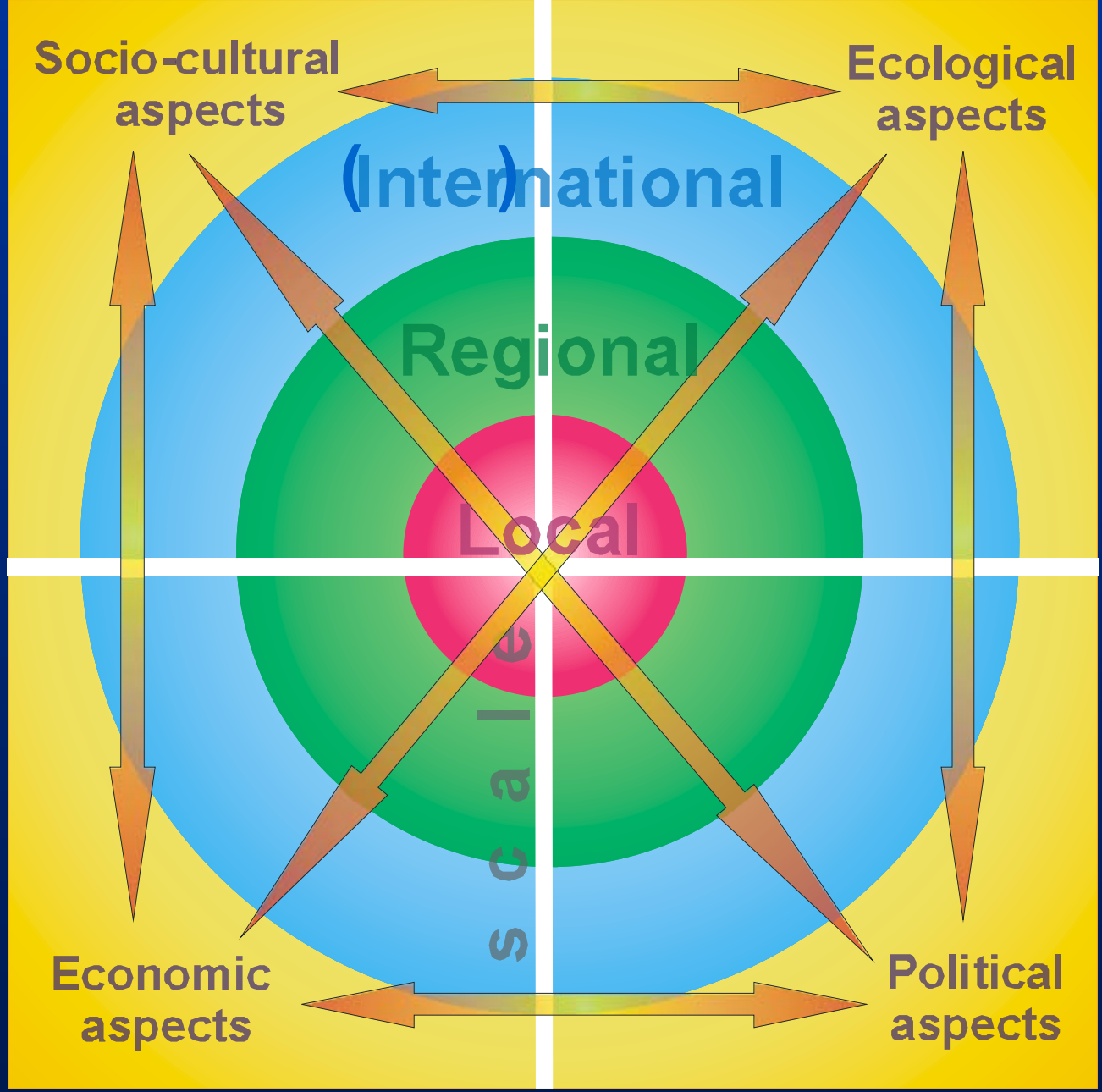
Central Research Questions

- „Which successful female farmer's (husband-wife-teams) strategies/activities in the frame of natural resource management do exist, and what are their interrelations?"
- „Which role do successful female farmer's (husband-wife-teams) play within the context of projects for a sustainable management of natural resources?"

  → trickle-down-effects
- "What are the characteristics of successful female farm managers (husband-wife-teams). „Why are they successful?"

  → success indicators


= farm
Levels of analysis
same AEZ
same AEZ
same AEZ
Project A
Project B
Project C
same AEZ
same AEZ
same AEZ
= local
= regional
= national
= international



Levels and aspects of analysis

Methods and Materials

Participant observation

Expert-interviews

Farm sketches & Transect walks

Question guideline

Questionnaire

Group Training, workshops

Field journal

ns (with other farmers, project staff, etc.)


Participant observation

2 Farmer's strategies:

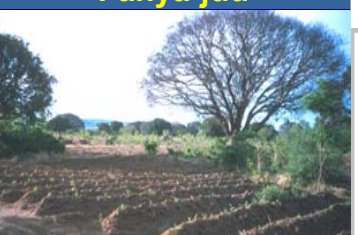
Physical soil conservation measures

(Level) bench terraces

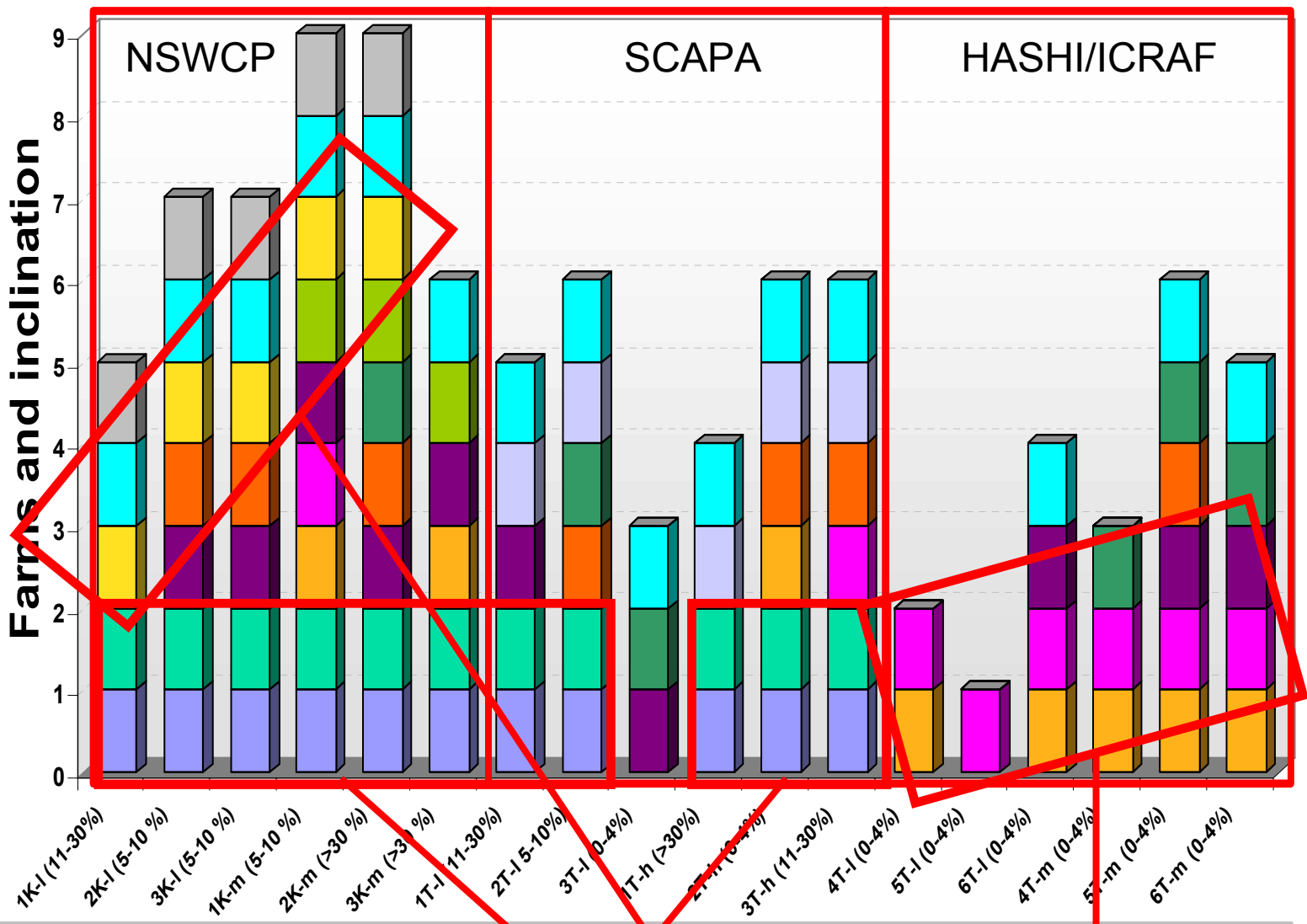
Contour furrows/bunds

Micro basins

Fanya-juu



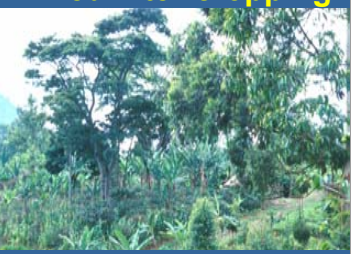
Raised beds



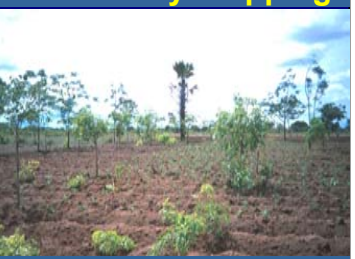
Trees on farm/field boundaries

Fallow

Mixed/inter-cropping

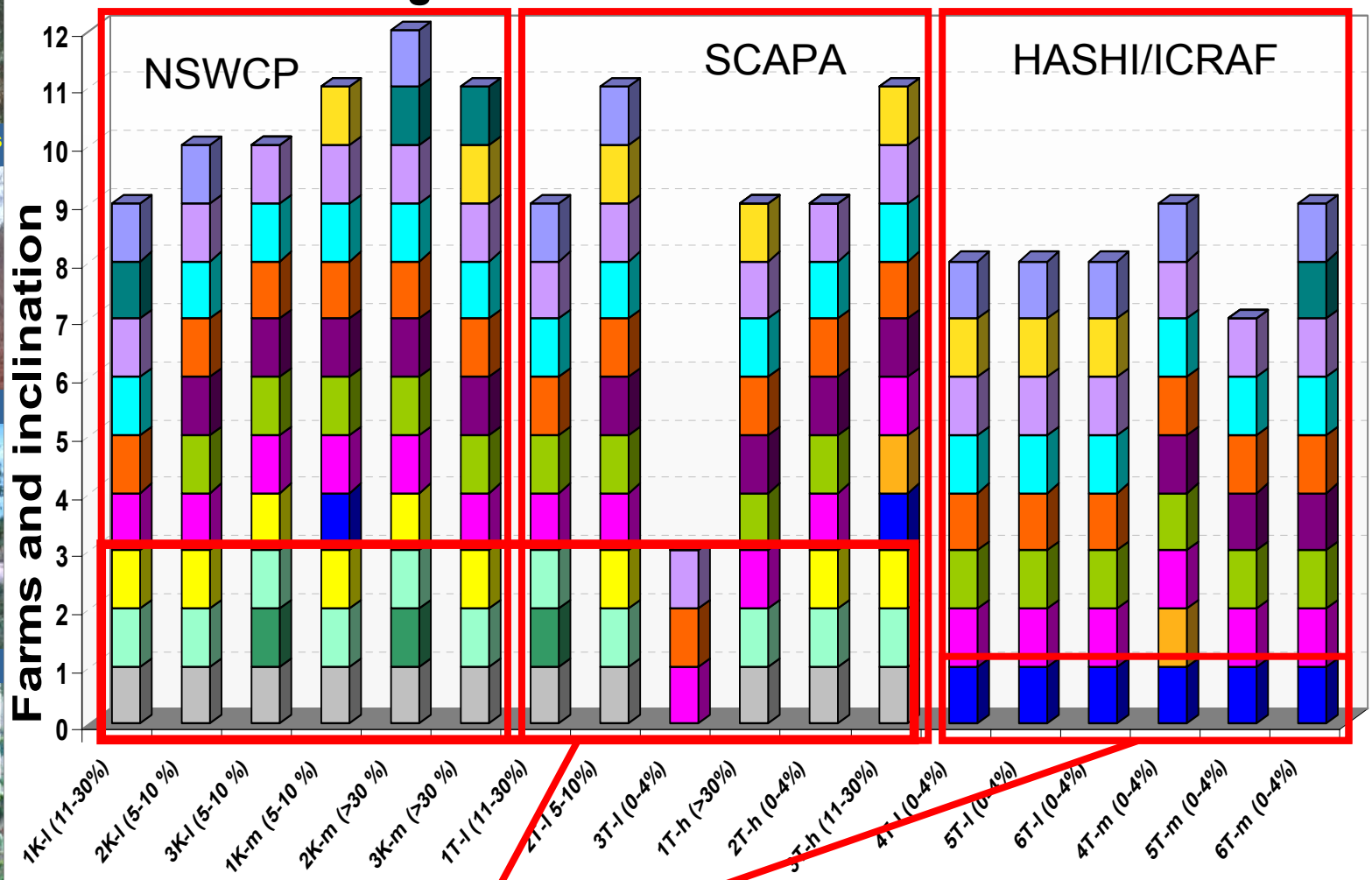


Multistorey cropping



Natural tree regeneration

Biological soil conservation measures



- Contour cultivation
- Contour vegetation strips
- Cultivation on raised beds
- Crop rotation
- Multistorey cropping
- Trees on soil conservation structures
- Hedgerow intercropping/alley cropping
- Natural tree generation
- Contour grass strips
- Cultivation along/in waterlines
- Trash lines
- Mixed/inter-cropping (crops)
- Trees scattered at random on farmland
- Trees on farm/field boundaries
- Fallow/rotational woodlots (ngitiri)

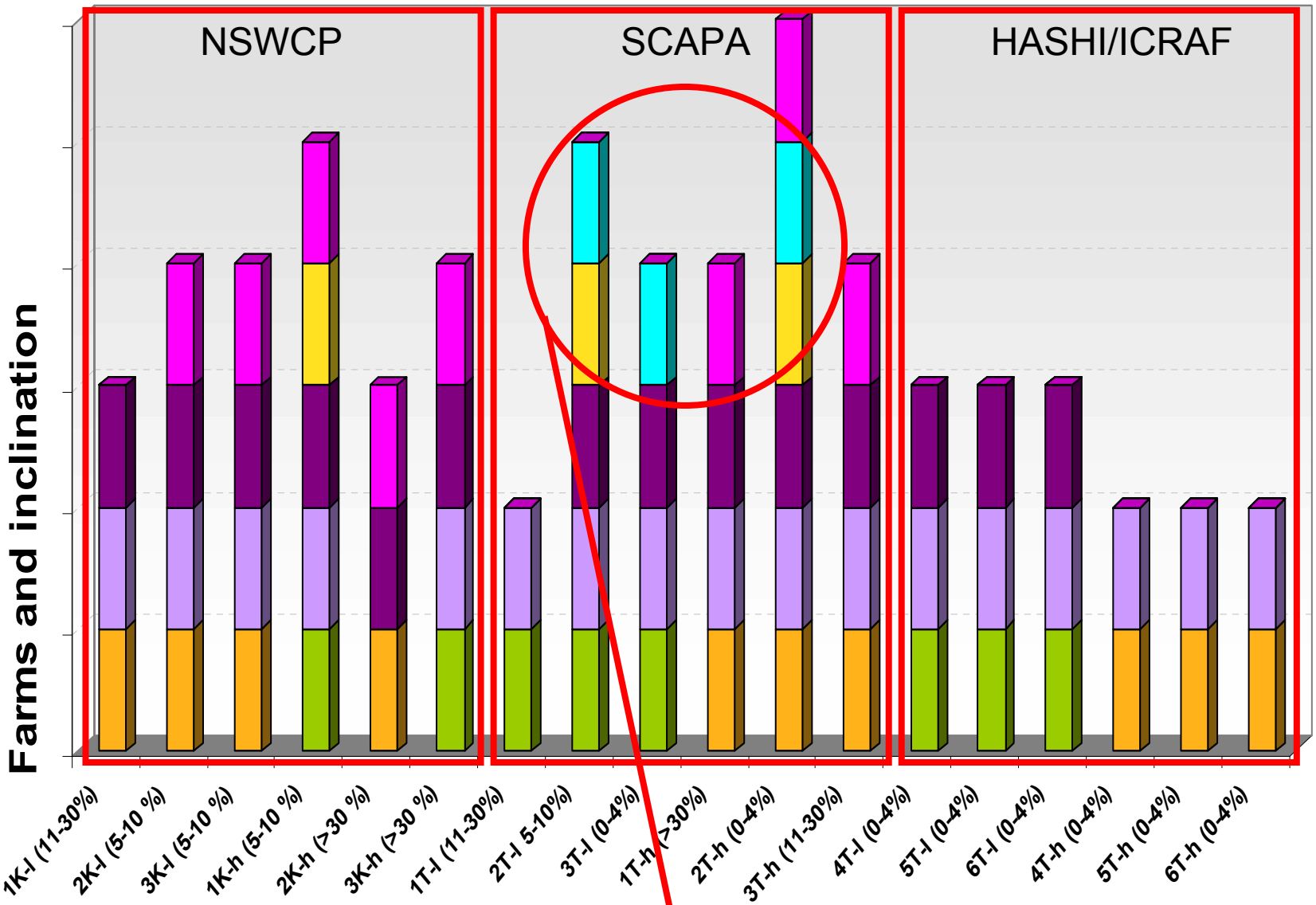
Measures for soil fertility improvement

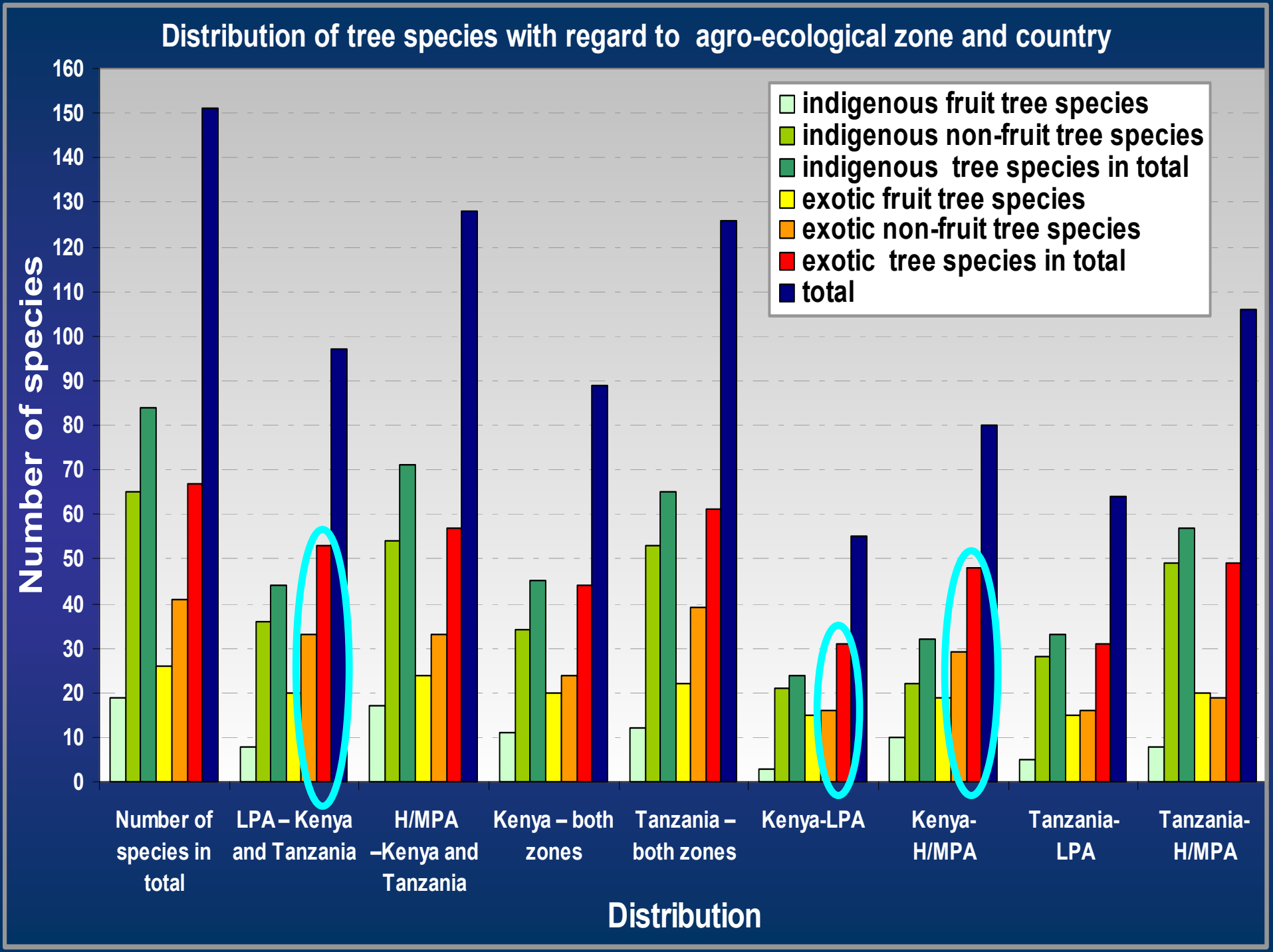

Mulching


farmyard manure

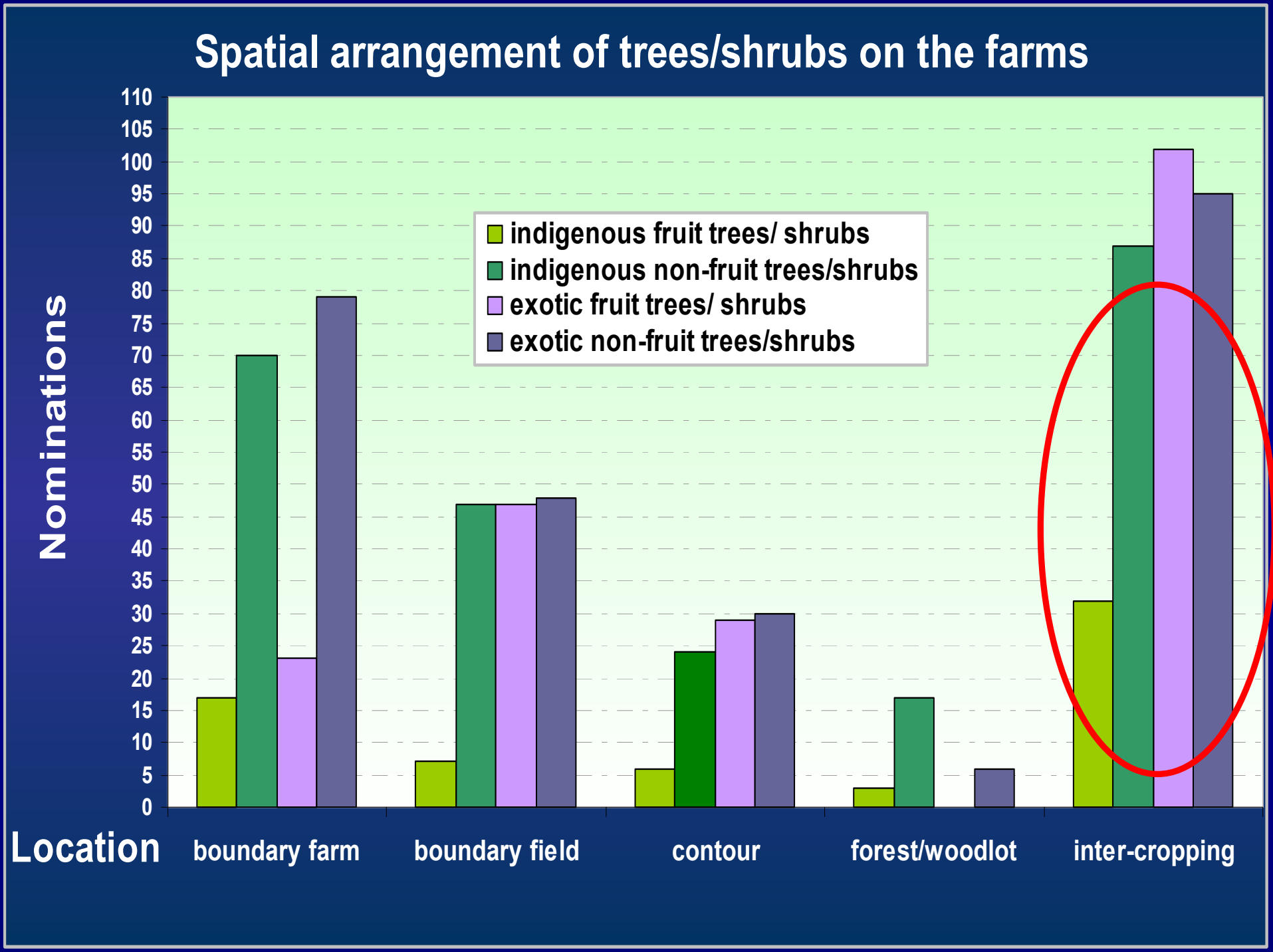

Liquid manure


Compost

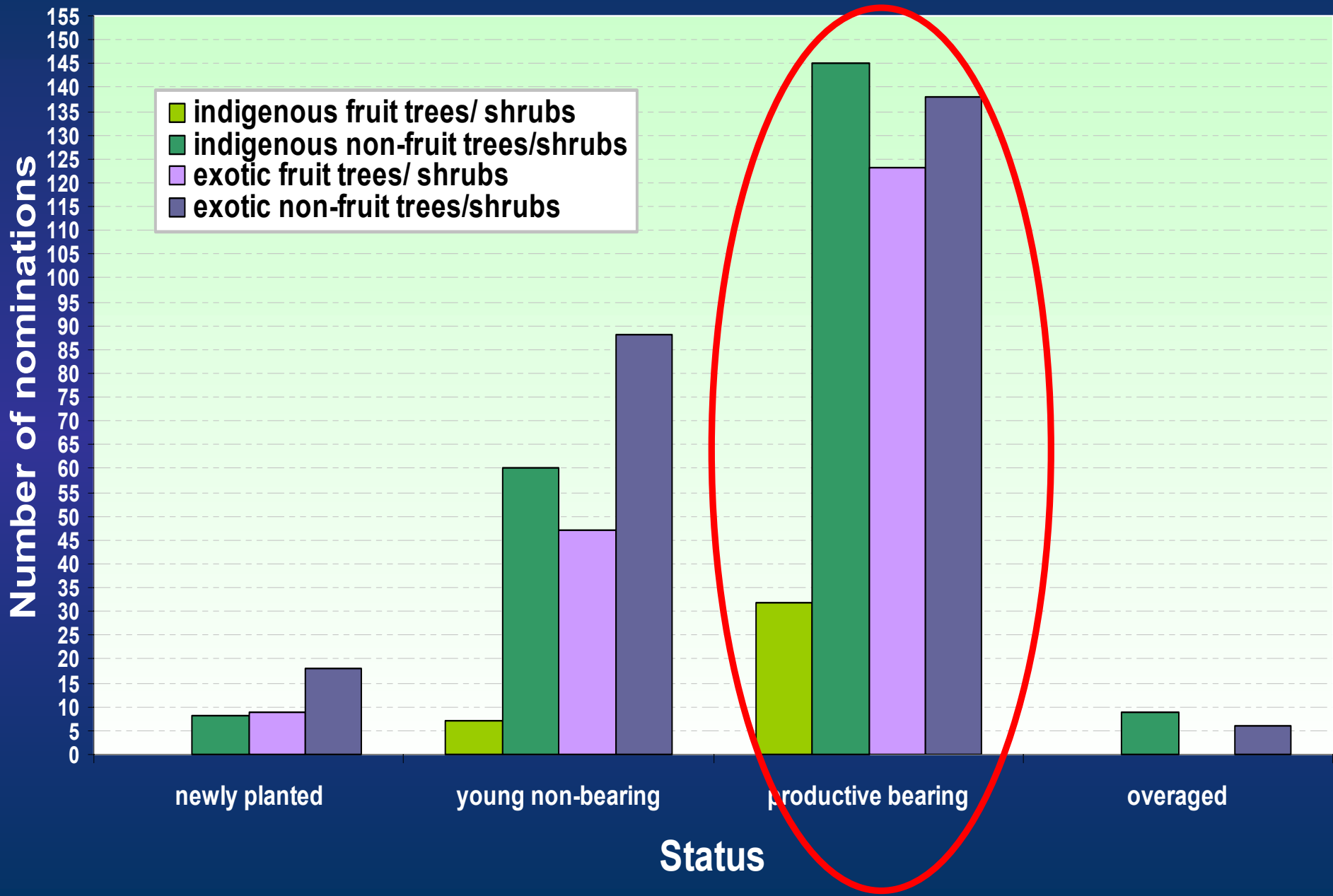



Distribution of tree species with regard to agro-ecological zone and country
Number of species
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
indigenous fruit tree species
indigenous non-fruit tree species
indigenous tree species in total
exotic fruit tree species
exotic non-fruit tree species
exotic tree species in total
total
Number of species in total
LPA – Kenya and Tanzania
H/MPA –Kenya and Tanzania
Kenya – both zones
Tanzania – both zones
Kenya-LPA
Kenya-H/MPA
Tanzania-LPA
Tanzania-H/MPA
Distribution

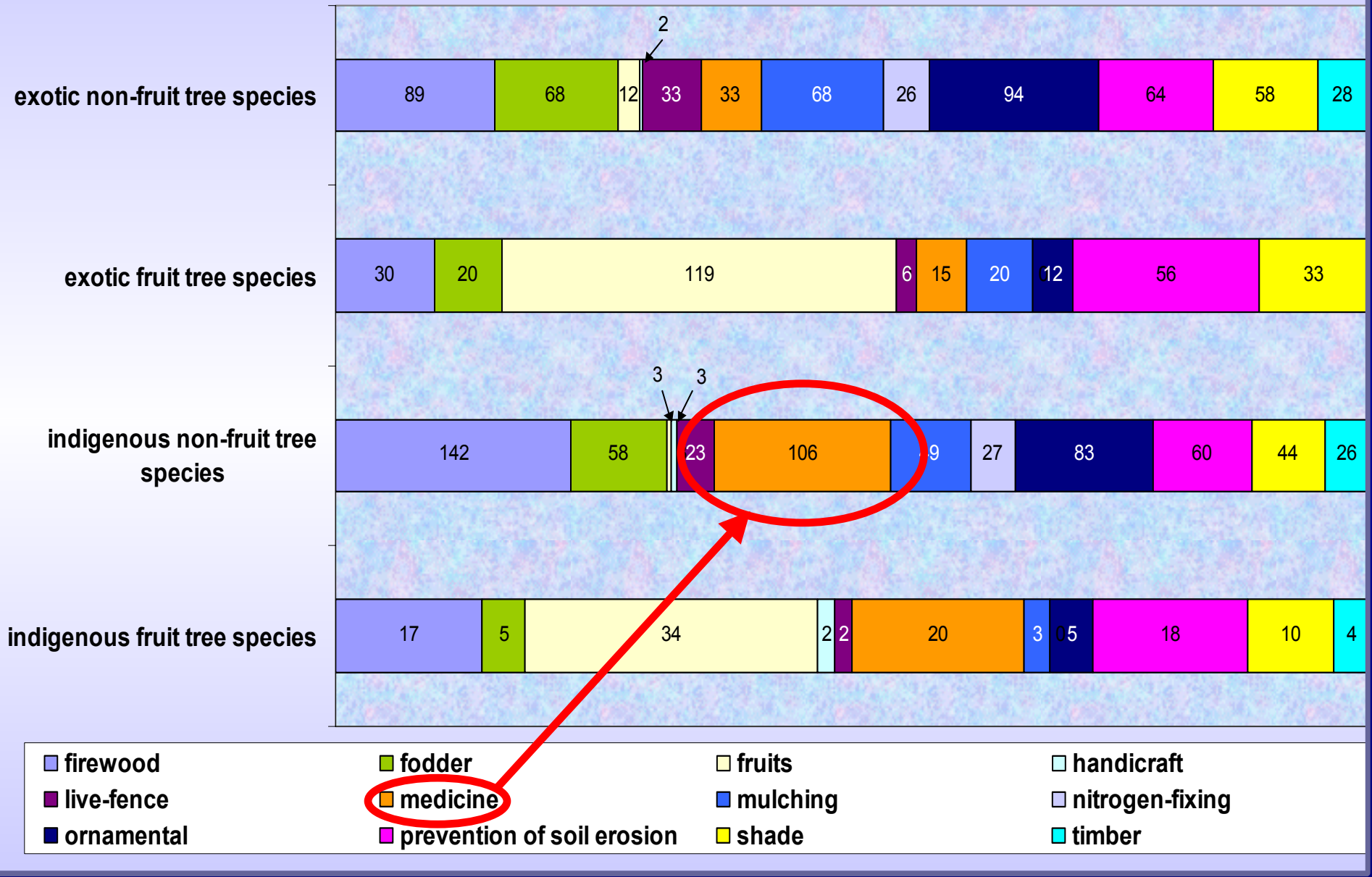
Spatial arrangement of trees/shrubs on the farms



Status of trees/shrubs on the farms



Use of tree species (nominations in absolute numbers)



Zero-grazing unit

Fodder bank (*Pennisetum clandestinum*)

Improved cooking stove

Other measures																		
zero grazing / own grazing area			X	X	/	X	X	X		X	X	X	X	X	X	/	/	
fodder bank – trees**					/		X	X		X	X	X	X	X	X	/	/	X
energy saving stoves (wood)		X	X	X	X	X	X	X					X		♦	♦		
energy saving stoves (charcoal)				X									X					
water harvesting (water tank)	X	X	X	X		X	X					X						

Legend:

K = Kenya; **T** = Tanzania; **l** = low potential area; **h** = high/mid potential area; **X** = carried out on the farm; X = carried out partly/little on the farm; / = no livestock; * = inclination > 4 %; ** = *Leucaena ssp.*, *Gliricidia s.*, *Flemingia m*, etc.; ♦ = ordered; ☐ = not on the resp. farm; ☐ = not in the resp. zone/country

Watertank

3 Success indicators

Ranking of success indicators for married women, female-headed households and women leaders

Indicators	married women					female-headed households					women leaders				
	Total	K	T	LPA	H/MPA	Total	K	T	LPA	H/MPA	Total	K	T	LPA	H/MPA
Number farmers	10	4	6	6	4	8	2	6	3	5	11	6	5	6	5
Number farmers without husband						8	2	6	3	5	3	2	1	1	2
Average age	45,1	55,8	38	44,8	48	40,1	45,5	38,3	40,7	39,8	46,5	52,3	42	47,3	48
Average household size	5,1	4,3	6,2	4,8	6,6	8,2	7,5	5,7	5	6,8	5,7	5,3	6,2	4,7	7
Average number of children in household	2	1	2,7	1,8	2,6	3,6	3	3,3	2,7	3,6	2,3	1,7	3	2	2,6
Average family size	14,4	22,5	9	1,4	15,5	15,7	10,5	12,2	10,3	12,6	14,3	18,5	9,2	13,5	15,2
socio-cultural & political indicators															
Group engagement -ff	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Active knowledge dissemination on snrm -ff	●	●	●	●	●	●	●	•	●	●	●	●	●	●	●
Engagement parents in snrm - ff	●	●	•	●	●	●	●	●	●	●	●	●	•	●	●
Women's group –position	●	●	●	●	●	•	●	•	•	•	●	●	●	●	●
Training (project and other institutions)	●	●	●	●	●	•	•	•	•	•	●	●	●	●	●
Freedom of decision-making	●	●	•	●	•	•	•	•	•	•	●	●	●	●	•
Public position (former) husband	●	●	•	●	●		●		•	•	•	•	•	•	•
Education	•	●	•	•	•	•	●	•	•	•	•	●	•	•	•
Land tenure rights - ff	•	•	•	•	•	•	•	●	●	•	•	•	•	•	•
Duration of project contact	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Knowledge/use of nat. medicine & pesticides - ff	•	•	•	•	•	•		•	•	•	•	•		•	
Position in groups inclusive initiative aspect	•	●	•	•	•						•	•	•	•	•
Church group – position	•	●	•	•	•		•		•	•	•	●	•	•	•
Active knowledge dissemination on snrm -hb	•	●	•	•	●						•	•	•	•	•
Knowl./use of nat. medicine/pesticides (former) - hb	•	•	•	•	•						•	•	•	•	•
Education father	•	•	•	•	•		•			•	•	•	•	•	•
Education mother		•			•						•				•
Community/job position parents							●			•		•			
Vocational training	•	•	•	•	•		●				•	•		•	•
Group initiator (women's/church/mixed)	•	●									•	•		●	
Treasurer, secretary of group	•	•		•							•	•		•	
Mixed group – position											•	•			
Experience with resource degradation - ff	•	•	•		●						•	•	•		●

Ranking of success indicators for married women, female-headed households and women leaders

Indicators	married women					fhh					women leaders				
	Total	K	T	LPA	H/MPA	Total	K	T	LPA	H/MPA	Total	K	T	LPA	H/MPA
Economic indicators															
Off-farm activities of husband	●	●	●	●	●						●	●	●	●	●
Improved cooking stove	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Accessibility of main road	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Supply with own firewood	●	●	●	●	●	●	●	●		●	●	●	●	●	●
Food/fodder supply (shortages)	●	●	●	●	●	●	●	●		●	●	●	●	●	●
Applied/received credit (incl. group)	●	●	●	●	●		●				●	●	●	●	●
Water supply	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Market situation (outlet, transport)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Distance to (farthest) field	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Size of land (for cultivation) in acre	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Livestock		●	●	●	●	●		●	●	●	●	●	●	●	●
Kind of house, valuables (furniture, etc.)	●	●	●	●	●	●	●			●	●	●	●	●	●
Bicycle	●	●	●	●	●			●			●	●	●	●	●
Labourers	●	●	●	●	●						●		●	●	●
Size of land (forest/woodlot, pasture)	●	●		●	●		●	●				●		●	●
Off-farm income activities both (Ksh/y)	●	●		●	●		●				●			●	●
Water tank	●	●		●	●		●				●	●		●	●
Plough	●	●		●							●	●		●	
Ranking income per capita	●	●	●	●	●						●	●	●	●	●
Ox-cart	●	●	●	●	●						●	●	●	●	
Off-farm income activities (except group) ff		●		●			●				●	●		●	●
Road condition up to main road during rains		●				●	●	●		●		●			
Car	●	●			●										●
Ecological indicators															
State of land (soil erosion)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Diversity of biological measures	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tree species diversity – all	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tree species diversity – exotic	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Zero-grazing	●		●	●	●	●	●	●	●	●	●		●	●	●
Diversity of physical measures	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Crop diversity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Diversity of soil fertility measures	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Use of organic fertilisers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tree nursery (on-farm)	●	●	●		●	●	●	●		●	●	●	●		●
Tree species diversity – indigenous	●	●	●	●	●	●	●			●	●	●	●	●	●

Ranking of husband-related success indicators

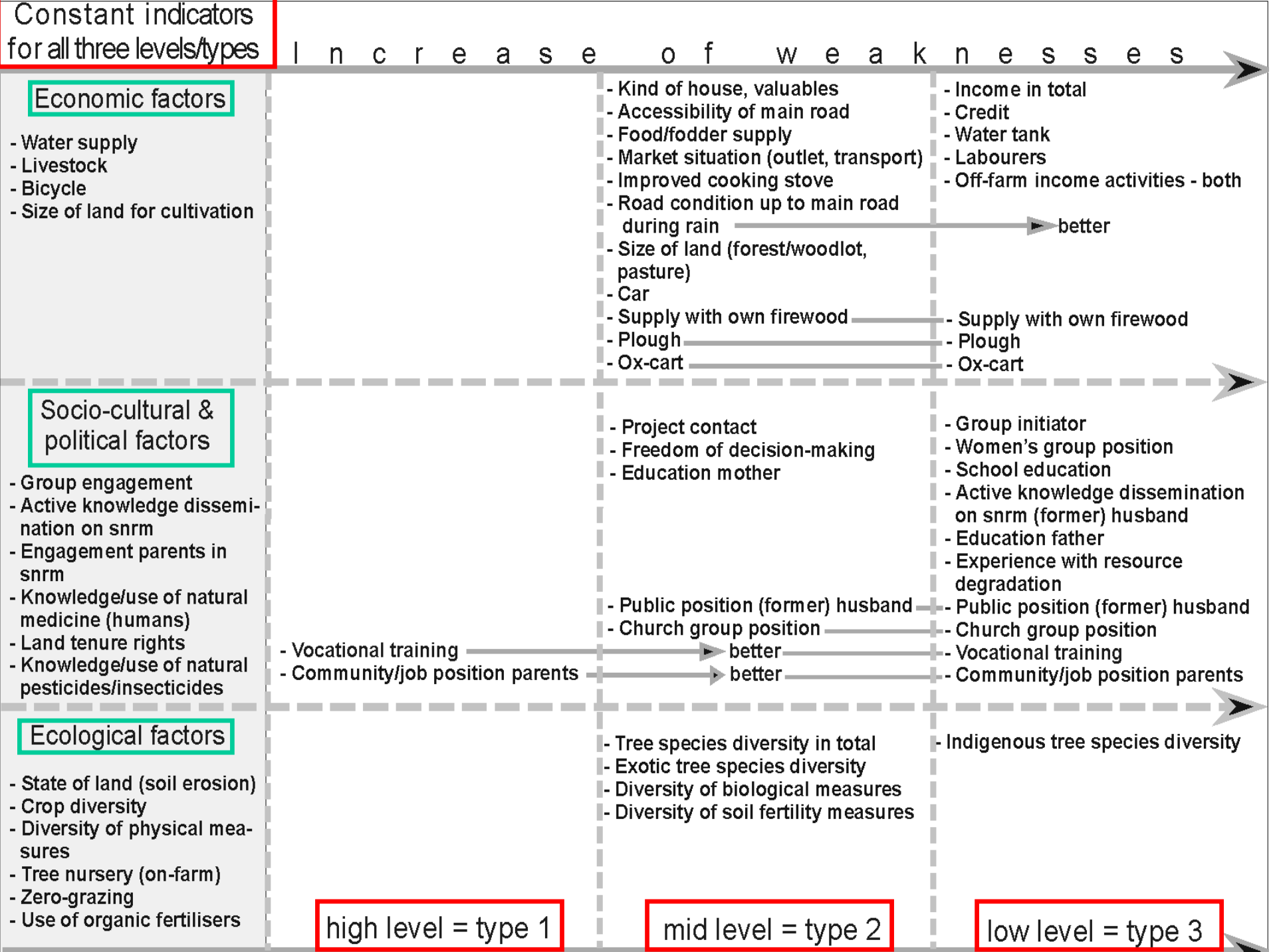
Indicators	Husband				
	Total	K	T	LPA	H/MPA
Number farmers	10	4	6	6	4
Average age	49,8	56,5	43,7	50,3	49
Socio-cultural & political indicators					
Active knowledge dissemination on snrm -ff	●	●	●	●	●
Engagement parents in snrm	●	●	●	●	●
Position in groups inclusive initiative - ff	●	●	●	●	●
Group engagement - ff	●	●	●	●	●
Freedom of decision-making - hb	●	●	●	●	●
Land tenure rights - hb	●	●	●	●	●
Public position	●	●	•	●	●
Active knowledge dissemination on snrm -hb	•	●	•	•	●
Vocational training	•	●	•		●
Knowledge/use of nat. medicine/pesticides	•	•	•	•	•
Education	•	•	•	•	•
Education father	•	•	•	•	•
Experience with resource degradation – hb	•	●		•	
Training (project and other institutions)	•		•		•
Community/job position parents					●
Education mother		•			

Overall estimation of success for each farm and assignment to 'success'-levels/generation of success-types

Farmers	Economic category	Socio-cultural & political category	Ecological category	Total	Success-level / success type
Scoring					
1K-m♦	1	1	1	1	1
3K-l♦	1	1	2	1	
2T-l♦	2	1	1	1	
2K-l♦	2	1	2	2	2
3K-m*♦	2	2	1	2	
1T-h♦	2	2	1	2	
3T-h♦	1	2	2	2	
2K-m*♦	2	2	2	2	
6T-l♦	2	2	2	2	
2T-h*	2	3	2	2	
1K-l♦	2	2	3	2	
4T-m	3	2	2	2	
1T-l*	2	3	3	3	3
5T-m*	3	3	2	3	
3T-l*♦	3	3	3	3	
4T-l*	3	3	3	3	
5T-l	3	3	3	3	
6T-m*	3	3	3	3	

Legend:

* female-headed household; ♦ group leader; **1** = high; **2** = mid; **3** = low
K = Kenya; **T** = Tanzania; **l** = LPA; **m** = MPA; **h** = HPA


Constant indicators for all three levels/types
Increase of weaknesses
Economic factors
- Water supply
- Livestock
- Bicycle
- Size of land for cultivation
- Kind of house, valuables
- Accessibility of main road
- Food/fodder supply
- Market situation (outlet, transport)
- Improved cooking stove
- Road condition up to main road during rain
- Size of land (forest/woodlot, pasture)
- Car
- Supply with own firewood
- Plough
- Ox-cart
- Income in total
- Credit
- Water tank
- Labourers
- Off-farm income activities - both
better
- Supply with own firewood
- Plough
- Ox-cart
Socio-cultural & political factors
- Group engagement
- Active knowledge dissemination on snrm
- Engagement parents in snrm
- Knowledge/use of natural medicine (humans)
- Land tenure rights
- Knowledge/use of natural pesticides/insecticides
- Project contact
- Freedom of decision-making
- Education mother
- Public position (former) husband
- Church group position
- Vocational training
- Community/job position parents
better
better
- Group initiator
- Women's group position
- School education
- Active knowledge dissemination on snrm (former) husband
- Education father
- Experience with resource degradation
- Public position (former) husband
- Church group position
- Vocational training
- Community/job position parents
Ecological factors
- State of land (soil erosion)
- Crop diversity
- Diversity of physical measures
- Tree nursery (on-farm)
- Zero-grazing
- Use of organic fertilisers
- Tree species diversity in total
- Exotic tree species diversity
- Diversity of biological measures
- Diversity of soil fertility measures
- Indigenous tree species diversity
high level = type 1
mid level = type 2
low level = type 3

4 Summary and outlook

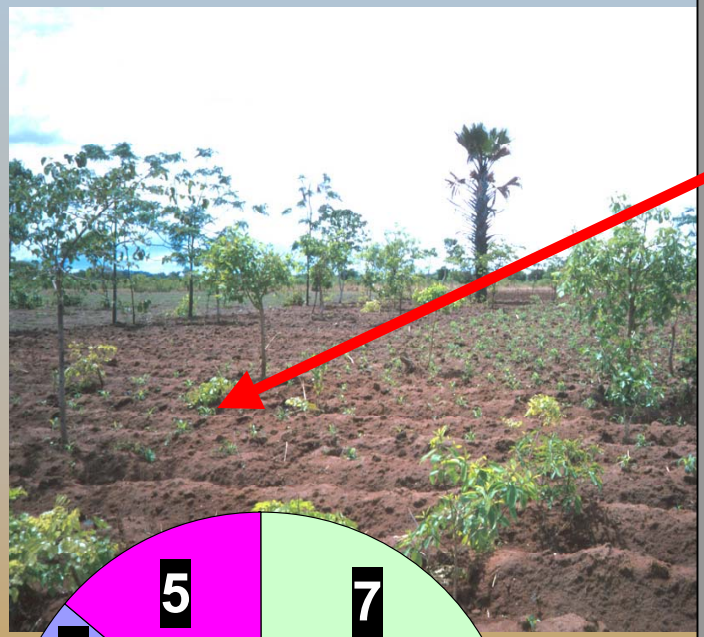
Effects

- Decrease of partly severe soil erosion phenomena
- Increase of agro-biodiversity → exotic species

Healing gully

Degree of Natural Potential

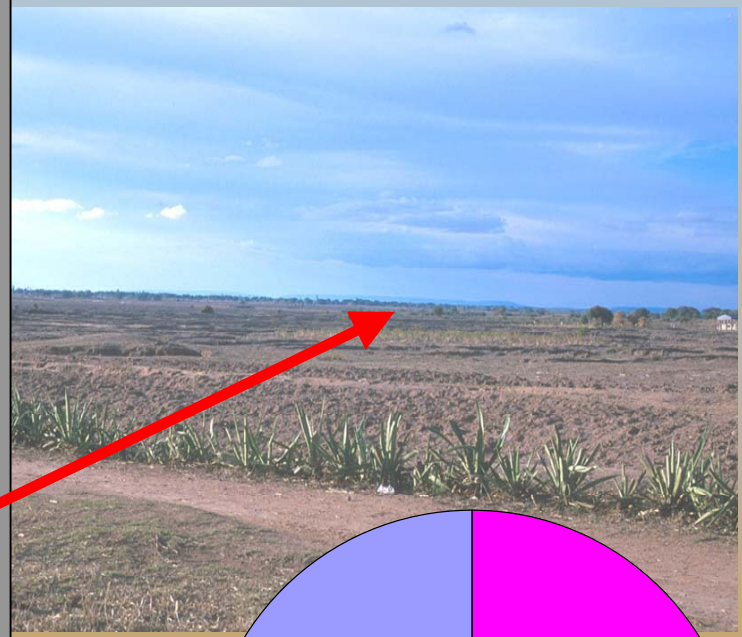
Farm 4T-m

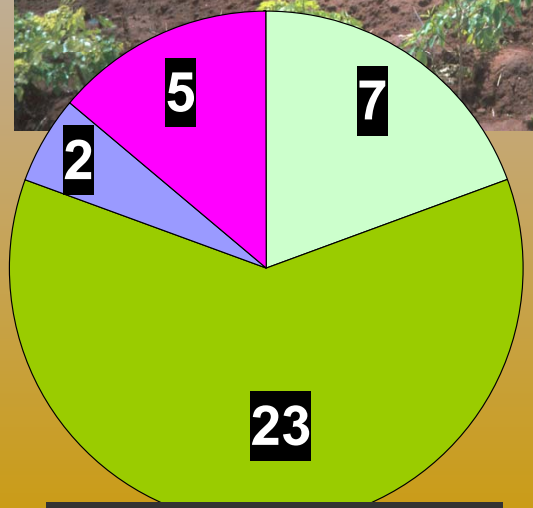


high

low

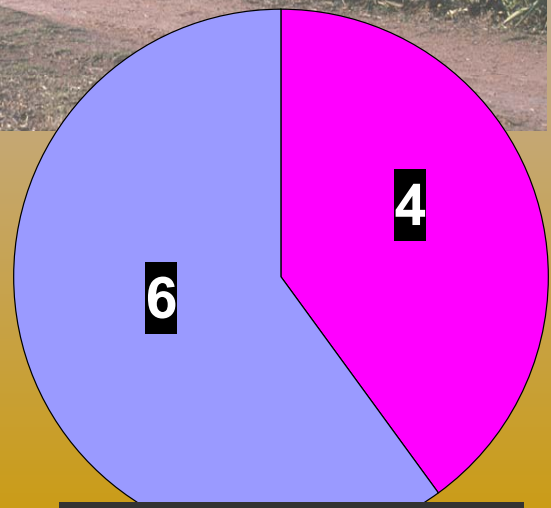
Farm 5T-m





37 species in total

Legend:
indigenous fruit tree species
indigenous non-fruit tree species
exotic fruit tree species
exotic non-fruit tree species



10 species in total

Effects

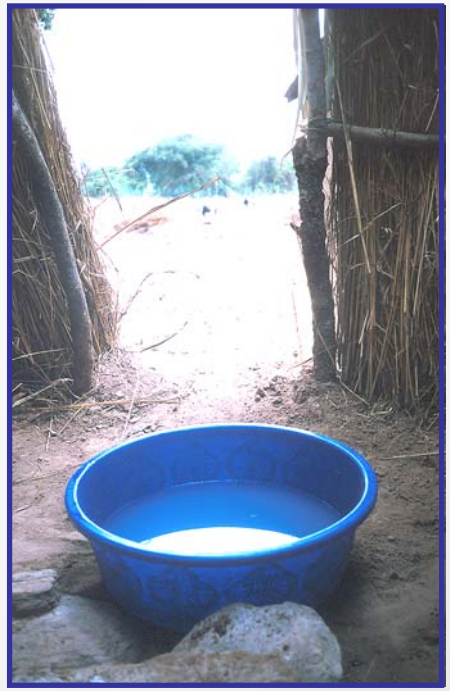
- soil fertility improvement
- enhancement of micro-climatic conditions

Manure spread on a field

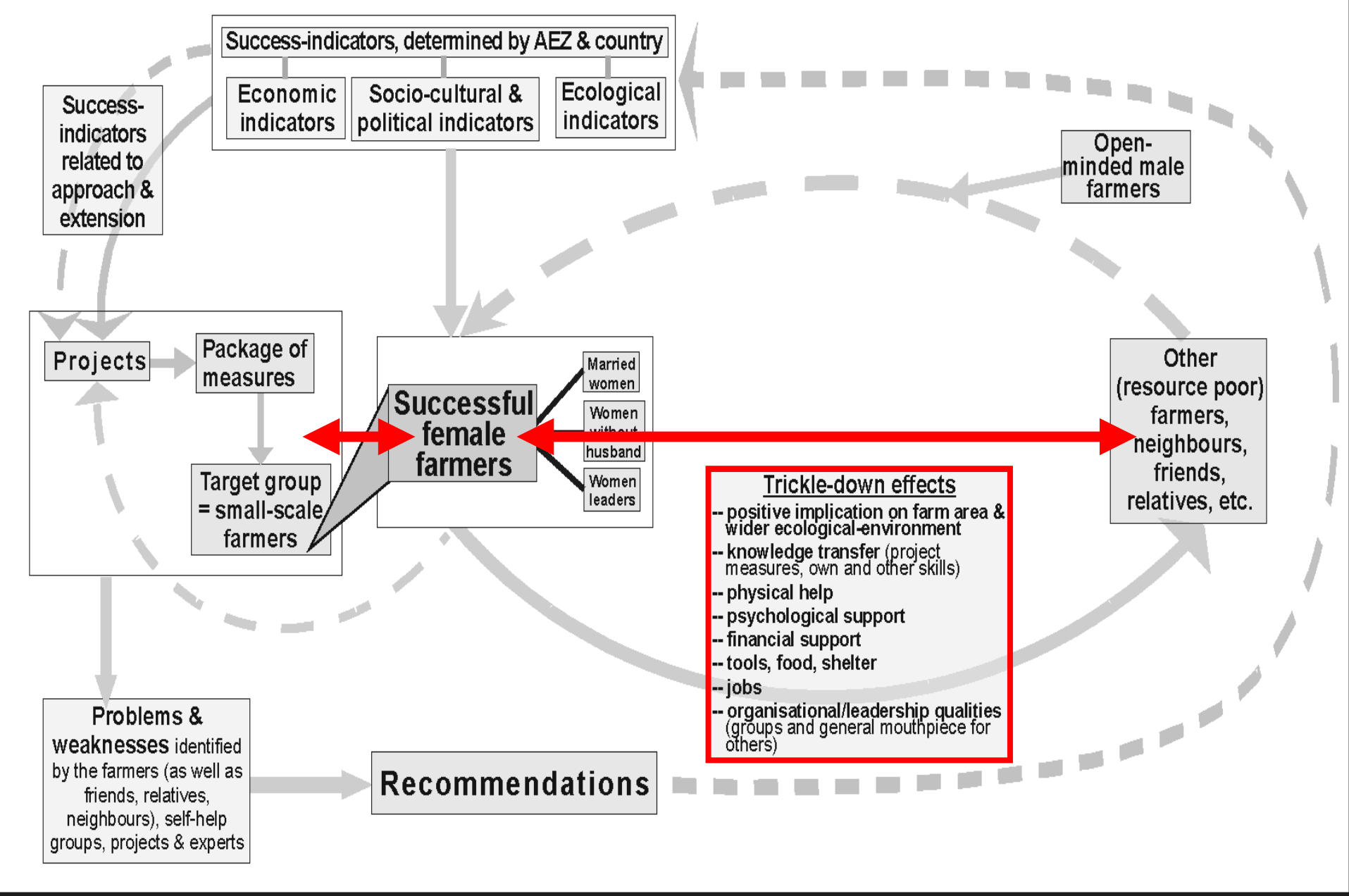
- improvement of energy (firewood) and water situation
- improvement of income situation
- stabilization of food situation

Traditio-nal dish in Tanzania

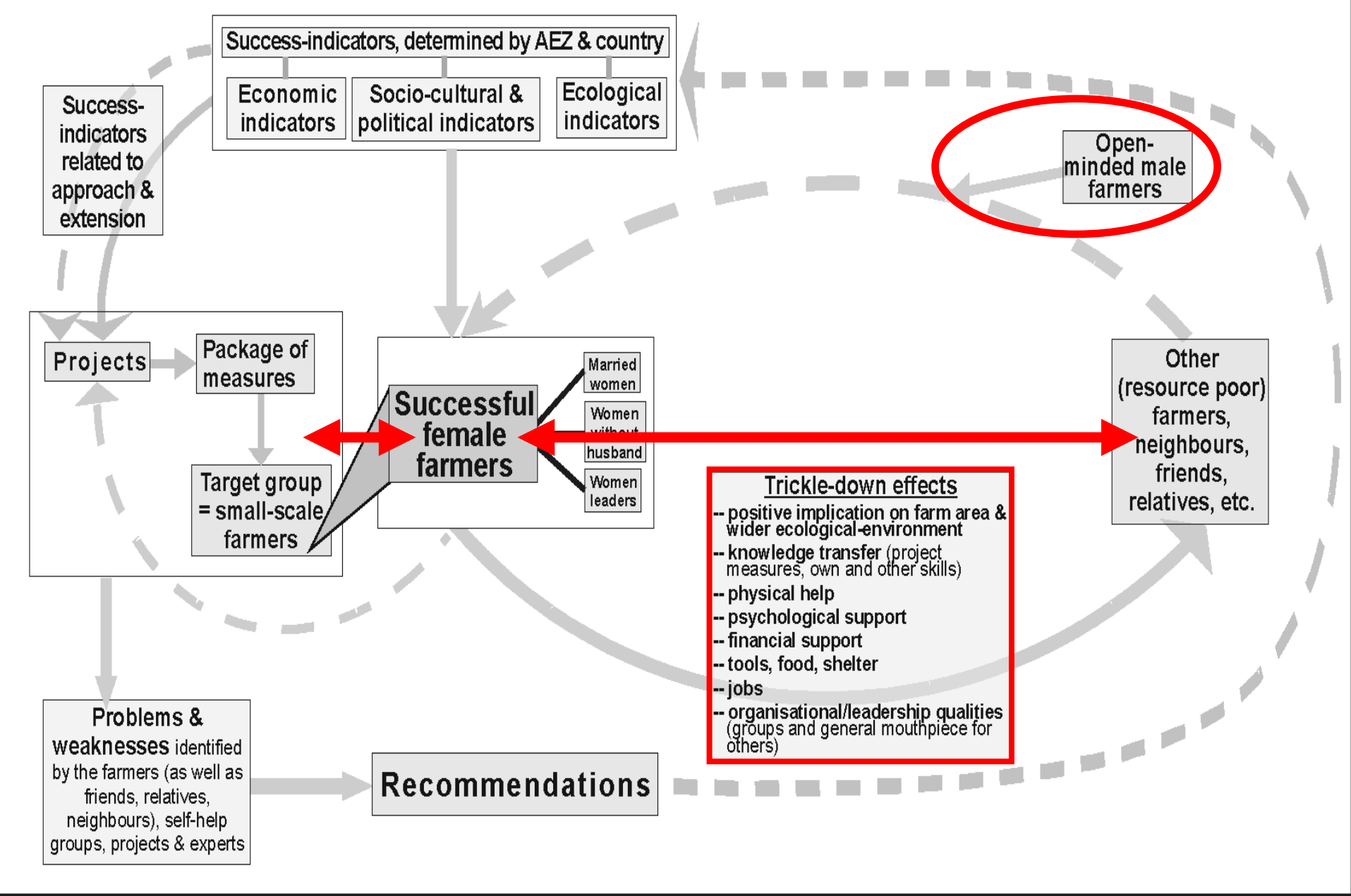
- enhancement of hygienic situation
- enhancement of health situation
  → treatment with herbal medicine
- enhancement of social status and position



‚bathroom‘


Success-indicators, determined by AEZ & country
Economic indicators
Socio-cultural & political indicators
Ecological indicators
Success-indicators related to approach & extension
Open-minded male farmers
Projects
Package of measures
Target group = small-scale farmers
Successful female farmers
Married women
Women without husband
Women leaders
Other (resource poor) farmers, neighbours, friends, relatives, etc.
Trickle-down effects
-- positive implication on farm area & wider ecological-environment
-- knowledge transfer (project measures, own and other skills)
-- physical help
-- psychological support
-- financial support
-- tools, food, shelter
-- jobs
-- organisational/leadership qualities (groups and general mouthpiece for others)
Problems & weaknesses identified by the farmers (as well as friends, relatives, neighbours), self-help groups, projects & experts
Recommendations
Legend:
Arrows indicate impact of a on b respectively knowledge transfer from a to b
Arrows indicate feedback from a to b

innovative,
engaged
male
farmers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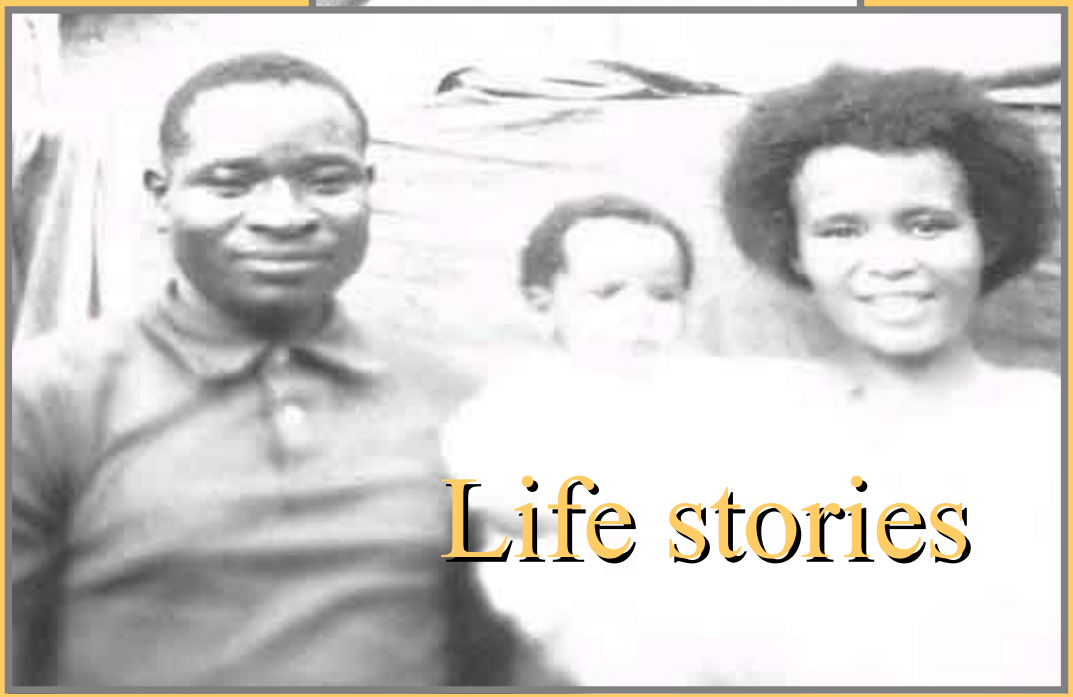
the closer men and women work together,
the higher the stability of living conditions



Life stories

People in the research area