

# Forestry:

As if People and Trees  
Matter

# Introduction

- After studying and practicing 'social / ecological forestry' over a number of years in Africa and South East Asia I have come to a number of conclusions about sustainable forestry.
- This presentation represents the first opportunity I have been given to communicate these conclusions with others in a forum of this kind and I look forward to it very much!

# Outline

- Brief description of natural forests
- Overview of plantations
- Comparison between the two poles
- Introduction to sustainable /multi-use forests
- An example of alternative forest management

# What are 'natural' forests?

A number of observations:

- Natural forests are the most interconnected and interdependent ecosystems that the world has ever supported.
- In their myriad forms without excessive human interference, forests represent the dominant vegetation type for most of the world's landmass.

- The evolution of any individual species pales into insignificance in comparison with awesome complexity of even the most ‘simple’ natural forest types.
- Humans almost certainly understand a smaller proportion of the interactions in forests than any other type of ecosystem.

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Note: It is uncertain whether there are any truly natural eco-systems in the world. I.e. ecosystems that have developed without human interference. Therefore ‘natural’ must be recognised as a relative term.

# And so...

- Taking the comments above to their logical conclusion. Key points with regard to forests and human intervention is,
- **On the positive side:**
  - Respect forests, observe intently before acting and minimise interference at all costs.
- **On the negative side:**
  - Interfering with a system which is not understood, risks negative unforeseen consequences.

# Forests as mosaics

Natural forests are never uniform. They are made up of numerous levels:

- **Individual trees** made up of cells, leaves, branches, trunks and roots\*, at different stages in their life cycle.
- Collections of even aged trees termed **chronounits**, usually as a result of an old tree falling.
- **Eco-units** - Collections of uneven aged trees (seedlings, saplings, transitional immature trees, mature and decaying trees).

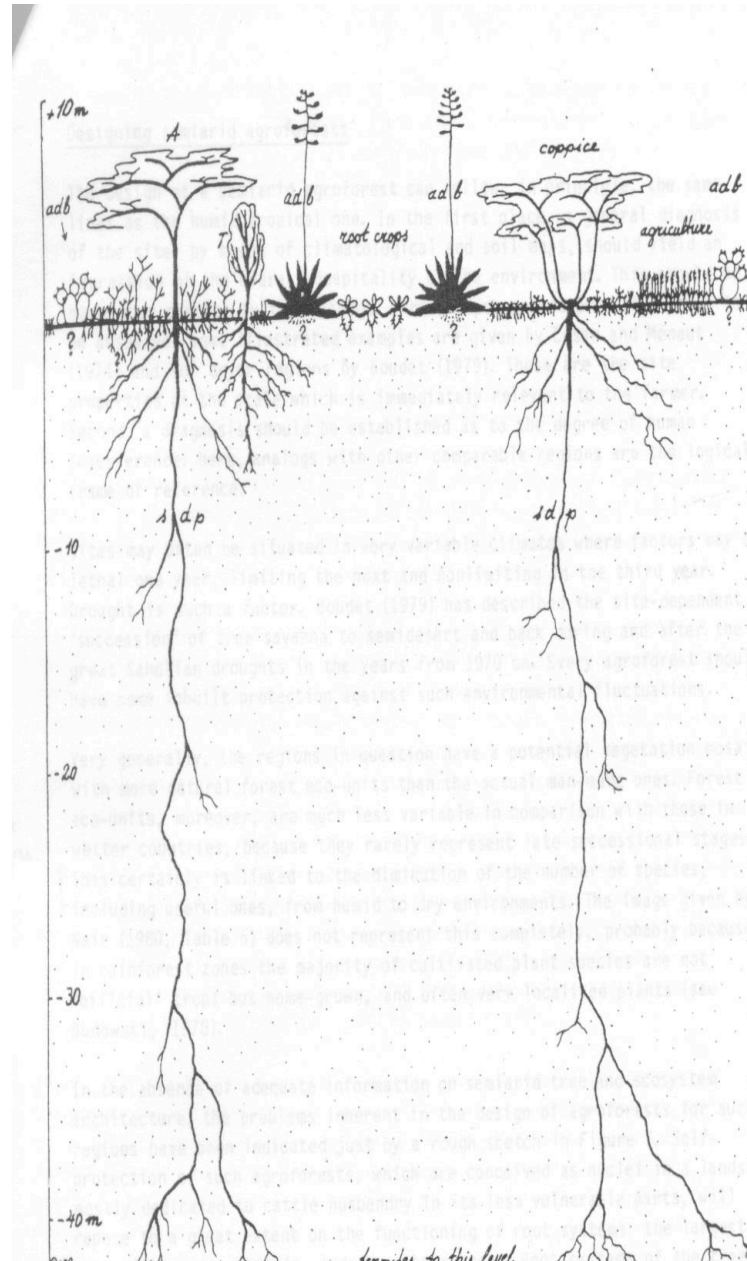
- **Eco-systems** - Collections of uneven age trees covering a larger differentiated environment (differing for example in aspect, topography and soil type).

The essential variances in forest type and level can be accounted for by geographical (space) and temporal (time) interactions. I.e. differences in micro-environment and growth stage.

The concept of a climax forest with distinct canopy layers has now largely been discredited in mature natural forests. Static systems don't exist in nature.



# Roots in arid zones



# What are Plantation Forests?

- Plantation forests are effectively very large farms where trees are grown instead of crops.
- Traditionally foresters tend to clear all natural vegetation cover and replace it with tree farms – normally consisting of a monoculture of one, timber species of even age.

	Conventional plantation forestry	Natural forests
Requirements	Biologically productive sites with fertile soils with relatively limited slope.	None. Spatially integrated within the larger agro-ecological landscape. Rainforests grow on some of the worst soil in the world.
Structure	Simple, spatially distinct, and single-tier stand structures of even-aged trees	Geographically and temporally complex, species-diverse biological systems. Multiple tiers of herb, shrub, and canopy layers.
Biomass production	Relatively low	Extremely high
No. of plant species per hectare	1 to a maximum of 5	Typically in the tropics >150
Products used by people	Typically yield poles and pulp for industry	A wide variety of timber and non-timber forest products. For example food, fuel, fodder, medicine etc...

Environmental effects	Soil degradation through nutrient leaching and accelerated erosion. Particularly during the establishment phase.	Rapid nutrient cycling and turnover, topsoil stabilization, groundwater retention, and improved surface water regulation and quality.
Risks	Plantation systems in the humid tropics have proven highly vulnerable to pests, windfall and poor growth rates.	Extremely resilient. Naturally evolved to be adapted to the environment.

In sum:

- In almost every instance, plantation forestry in the tropics has proven to be neither ecologically sustainable nor responsive to local social and economic conditions.

# Why plantations, or - how did we get ourselves into such a conundrum?

- Conventional forestry, as one of the applied sciences, is closely related to industrial agriculture and all that entailed.
- Conventional forestry arose in the temperate regions where monocultures sometimes occur naturally.

- Forests in the tropics were complex and beyond the scope of scientific research.
- Local people were rarely asked about the multiple uses of trees, even with regard to their value for timber.
- In forestry, the economic aspects have been emphasised to the virtual exclusion of social and environmental issues.

Foresters along the way lost the dynamic / adaptable approach to over specialisation and in effect knowing more about less.

# The fable of the ignorant white man (again!)

Or ... the story of my first humbling forestry  
experience in Malangali, Tanzania with  
'spontaneous participatory forestry'.

# Brainstorm:

Potential / actual uses of forests around the world:

- Social,
- economic
- and ecological.



# What is 'Sustainable' Forestry?

## My definition:

- A holistic, intergenerational approach to managing the world's largest natural vegetation type.

# Characteristics of sustainable forestry include:

- Use of the natural forest and local wisdom as the basis for the design of forests. I.e the intentional incorporation of existing natural vegetation.
- Avoid homogenisation and oversimplification at all costs.
- Forests for multiple use by multiple stakeholders (local and outsiders).

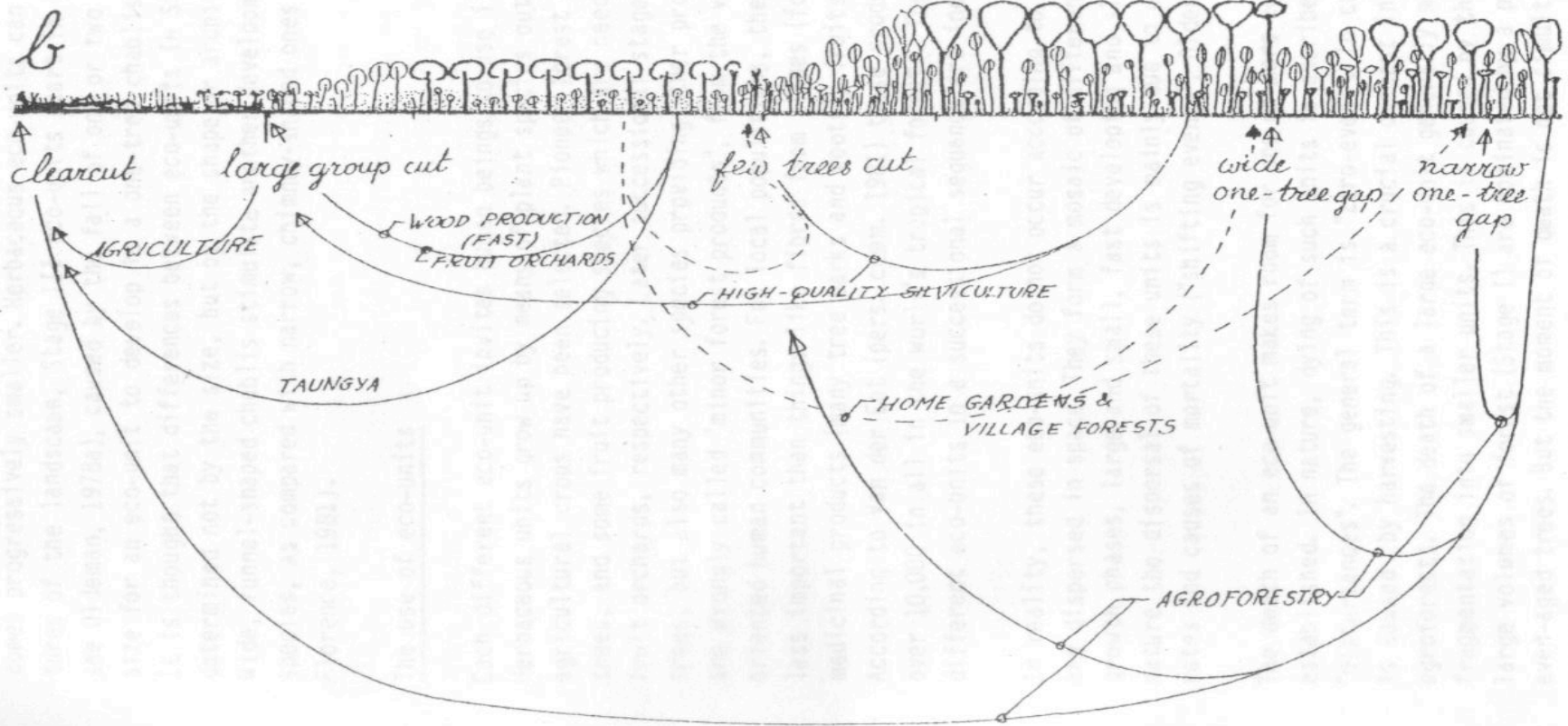
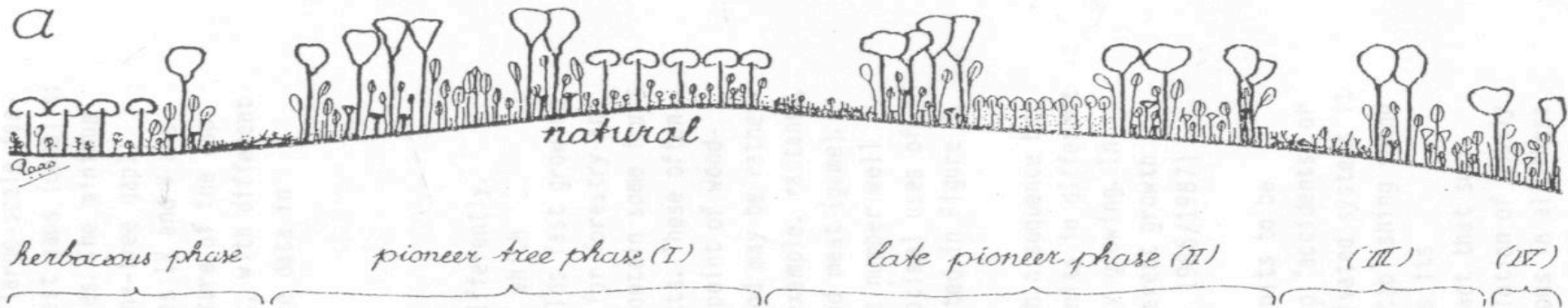
## Characteristics cont...

- In line with local priorities, durability and resilience emphasised over maximising production.
- Constant / cyclical production over one off harvests.
- Maximise cycling of resources within the system including especially nutrients and water.

# Economic multi-sectoral uses of forests

	Silviculture	Agriculture	Pastoralism
Silviculture	Conventional forestry	Agro-forestry	Silvo-pastoralism
Agriculture		Conventional agriculture	Agro-pastoralism
Pastoralism			Conventional pastoralism
“Normal” indigenous forest use	Agro-silvo-pastoralism		

# Developmental niches and human activities



# Agroforestry

Practical examples of agroforestry include:

- Crops within forests
- Fields within forests
- Forests within fields
- Trees with and / or between fields

Examples of silvo-pastoralism includes pollarding, coppicing as well as managed burning.

# The fable of the ignorant white man (part 2)

The mysterious  
agro-forestry tree.

# Group work

Consider the multiple uses of the TDEF forest, economically as well as otherwise.

What implications does a multiple use of the TDEF have on the way it needs to be managed to be sustainable?

In which ways do you think the TDEF could be managed to have the greatest chances of becoming sustainable?



# The ignorant white mans eureka moment!

Main personal conclusions developed during field work in Tanzania:

- Designs for agro / forest ecosystems are traditionally developed as if they are dead!

Based on the systems approach the effective design of living systems has to do with the life processes of:

- Continuous activity (**process**) which is involved in;
- the organisation (**pattern**) of the;
- material substance (**structure**).

All three of these criteria for living systems are totally independent and constitute attributes that can be effectively used to better understand the system.

# How is that useful?

Key features of Miombo:

- Indigenous trees were found to almost all leguminous.
- The mulch from the leaves was found to be richer in nitrogen than the manure from the corrals.
- Miombo is also an excellent source of fodder;
- with a remarkable ability to regenerate.



# Silvo-pastorilial Projection

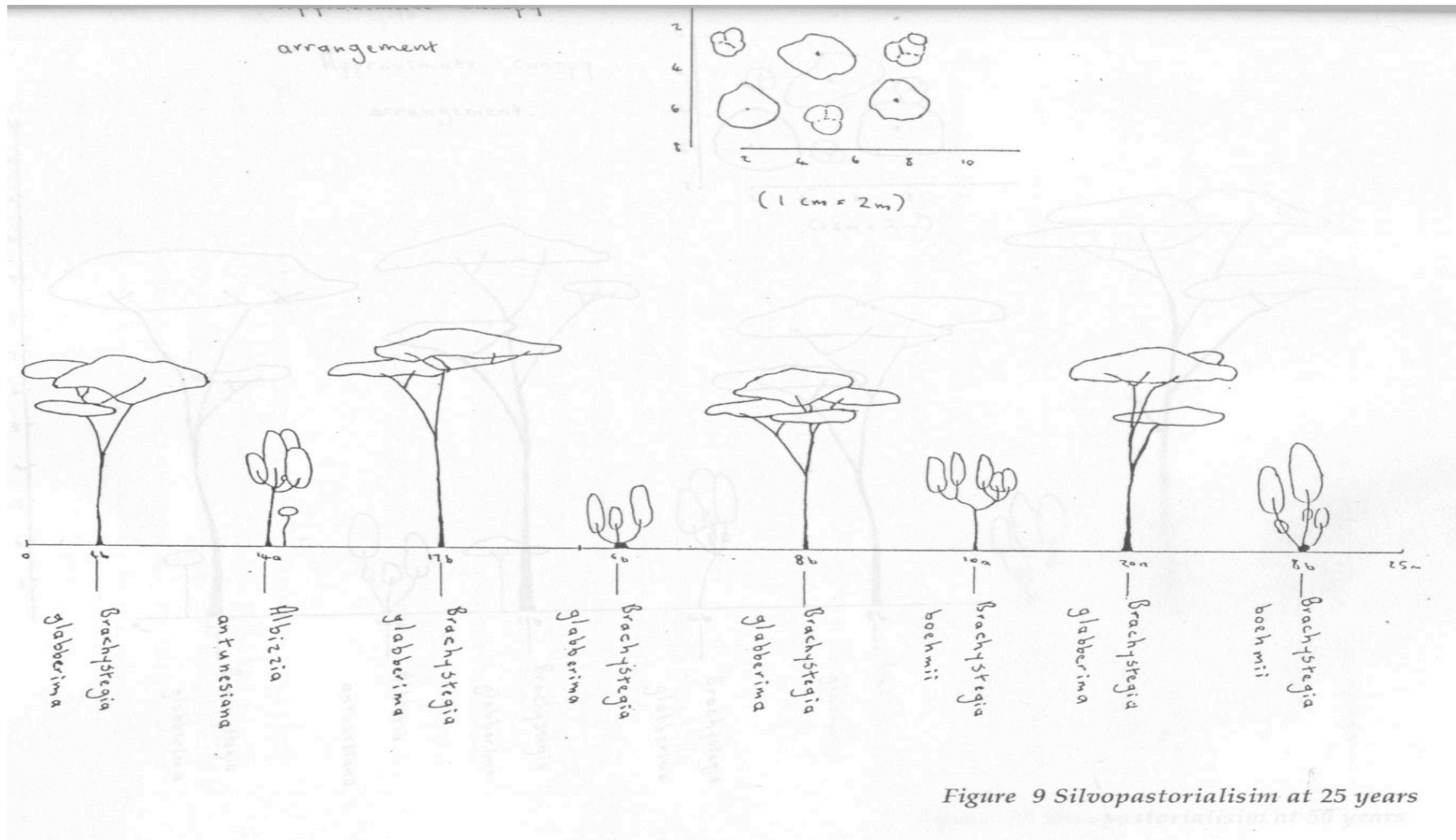


Figure 9 Silvopastoralism at 25 years

# Agro-forestry Projection

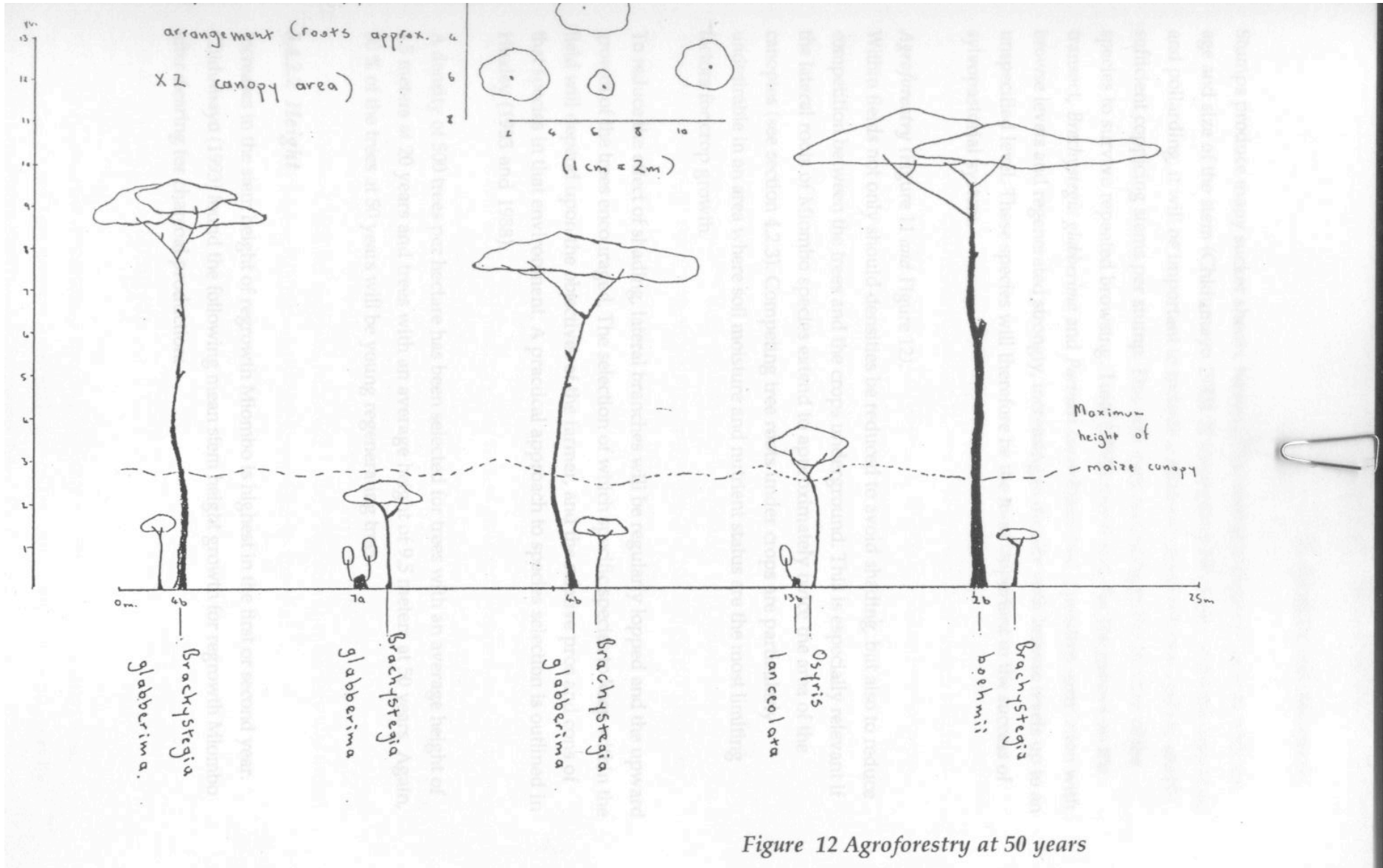


Figure 12 Agroforestry at 50 years

# A viable design for agro-forestry

- Using a 4 X 50 metre transect in typical degraded Miombo;
- with minimal external inputs and socio-economic restrictions of the 'average' local farmer;
- and maximising the integration of crop and livestock:

Annual profits raised from 250 US\$ to 730\$.

# Conclusion

Sustainable forestry is –

A holistic, intergenerational approach to managing the world's largest natural vegetation type.

The effective design of living systems entails working in accord with all of the life processes of structure, pattern and process.