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DEFINING FUNCTIONAL GROUPS OF TREE ACCORDING TO RURAL STAKEHOLDER PERCEPTIONS IN CENTRAL-MALI

FUNCITREE - WP3

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AGRICULTURAL RESEARCH FOR DEVELOPMENT

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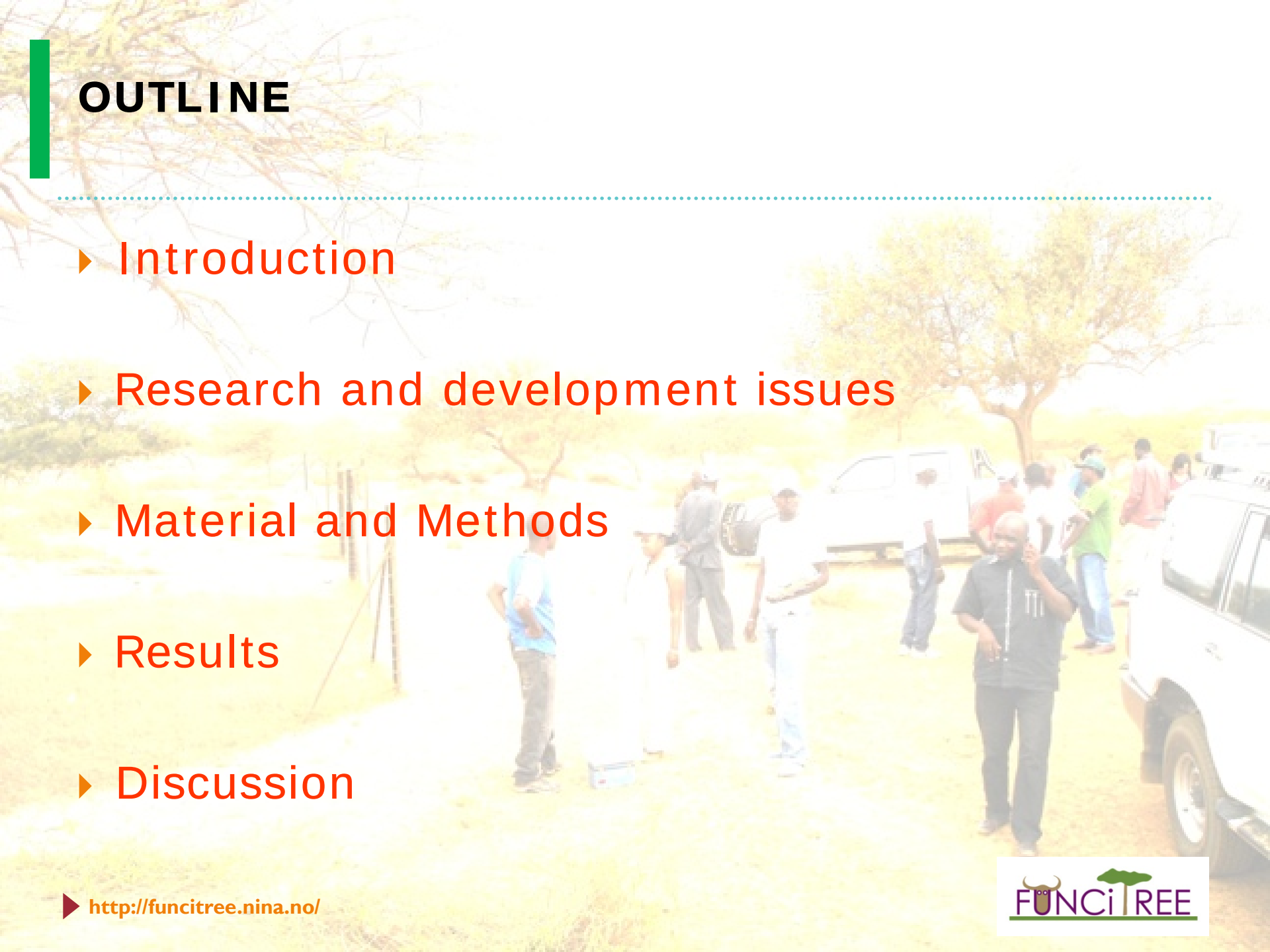


INTRODUCTION

- Sahel :
  - High climate variability and drought
  - Demographic growth
  - Crop field expansion; high pressure on land
- Ecosystems :
  - Degradation of agroforestery parklands
  - Tree density globally decrease (Boffa, 2000)
  - Low regeneration; diversity loss (Rouxel et al. 2005)
  - Soil fertility loss

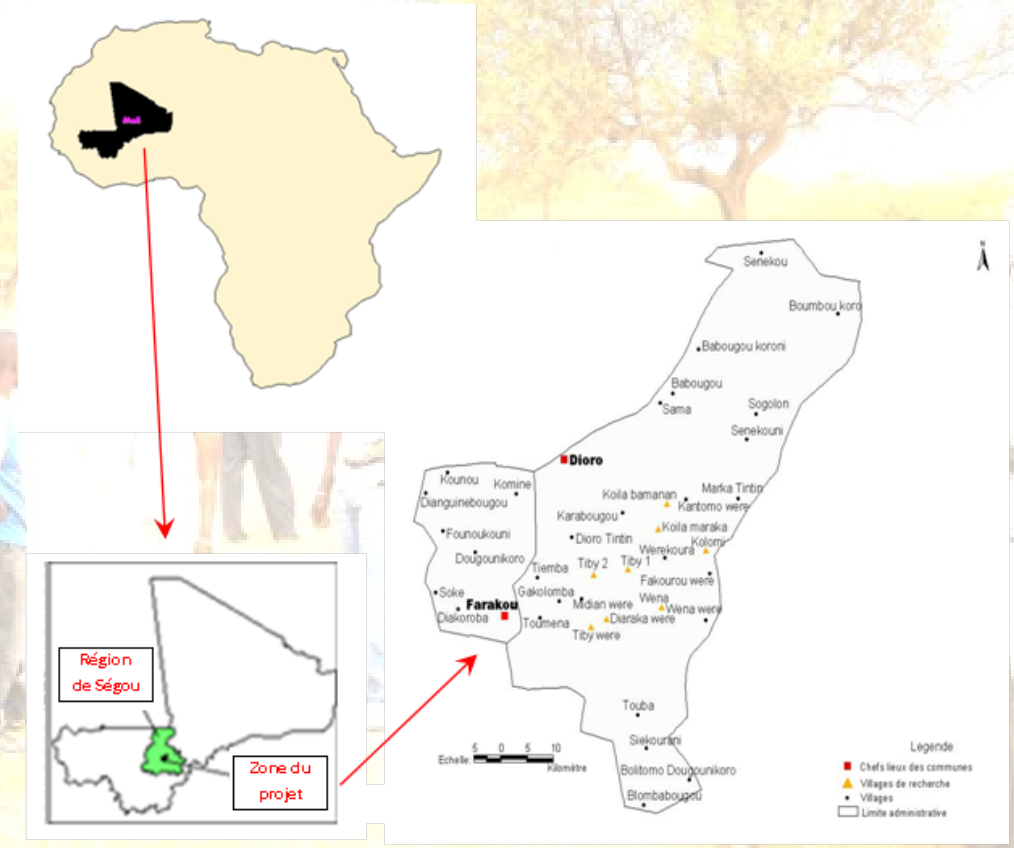
RESEARCH AND DEVELOPMENT ISSUES

- Sustainable Management of Agroforestry Systems
- Taking into account local stakeholders needs
- Diversity of stakeholders, uses and perceptions
- Management engineering of agroforestry systems
- How to help regeneration of trees and ecosystem services ?

MATERIAL AND METHODS

- Central Mali; Segou Area; Tiby village

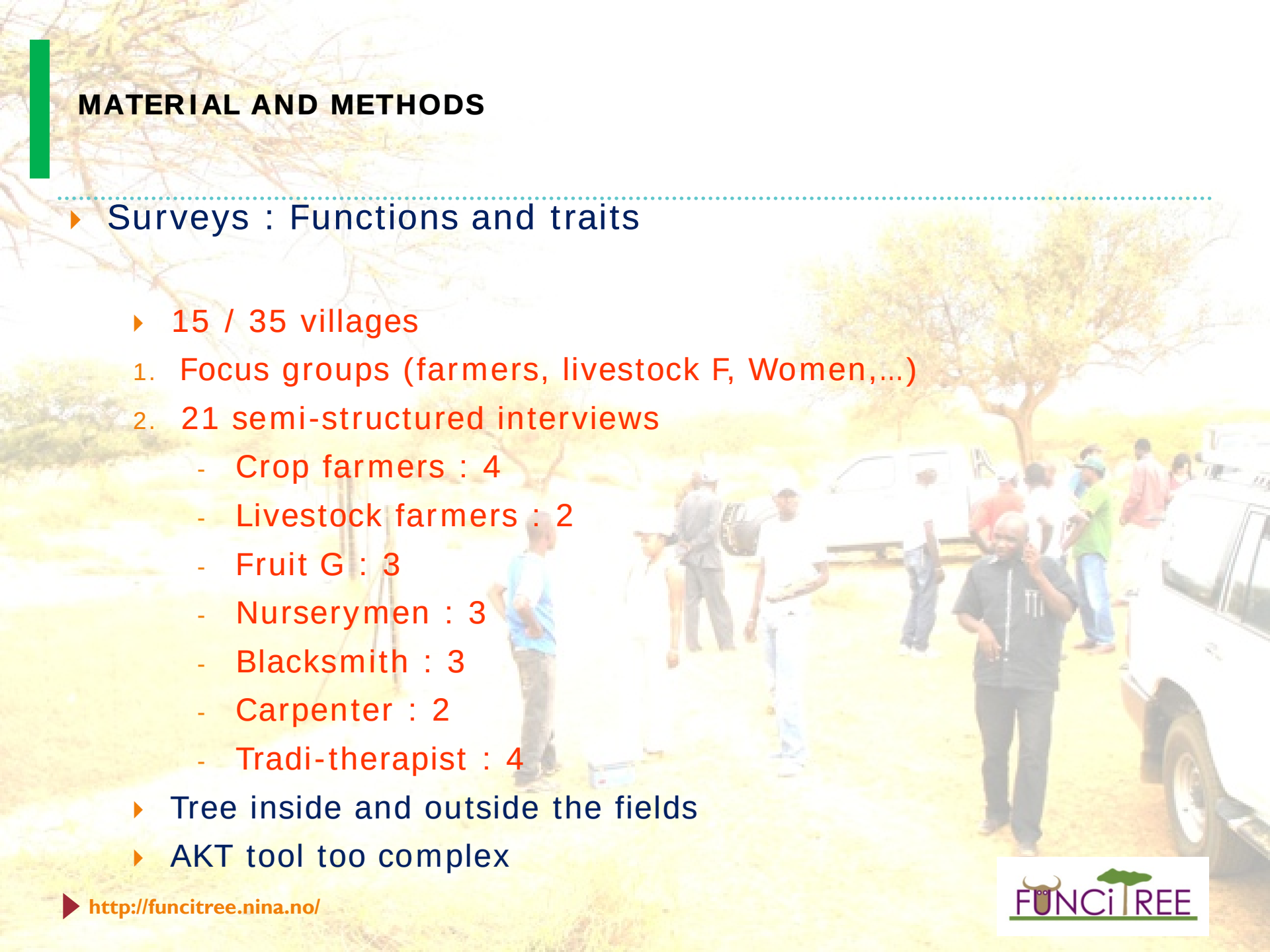
  - Soudano-sahelian zone
  - 600-800mm
  - Agrosylvopastoral
  - Rice
  - Rainfed crop
  - Gardening
  - Orchard
  - Livestock
  - Others stakholders



MATERIAL AND METHODS

- Surveys : Functions and traits

  - 15 / 35 villages
  1. Focus groups (farmers, livestock F, Women,…)
  2. 21 semi-structured interviews
     - Crop farmers : 4
     - Livestock farmers : 2
     - Fruit G : 3
     - Nurserymen : 3
     - Blacksmith : 3
     - Carpenter : 2
     - Tradi-therapist : 4
  - Tree inside and outside the fields
  - AKT tool too complex



Results : Tiby database on tree functions and traits

Local knowledge about functions and functional traits of tree species in the agroforestry parklands of Tiby area, Segou region,										
Data collected by Pierre Clinquart from May to June 2010, Master										
Tree species			Organoleptic qualities					Consis		
N°	Common name (Bambara)	*Scientific name*	Bitter fruits	Acid fruits	Sweet fruits	Bitter leaves	Acid leaves	Fruits with few pulp	Fruits with dusty pulp	Fruits with firm pulp
1	Dogo iri	*Acacia colei*	0	0	0	0	0	0	0	0
2	Boina	*Acacia nilotica*	0	0	0	0	0	0	0	0
3	Patuku	*Acacia senegal*	0	0	0	0	0	0	0	0
4	Zadjé	*Acacia seyal*	0	0	0	0	0	0	0	0
5	Baki	*Acacia tortilis ssp. raddiana*	0	0	0	0	0	0	0	0
6	Zira	*Adansonia digitata*	0	0	1	0	0	0	1	0
7	Yégéré	*Albizia chevalieri*	0	0	0	0	0	0	0	0
8	Somo	*Anacardium occidentale*	0	1	1	0	0	0	0	0
9	Toubabou Sunsu	*Annona squamosa*	0	0	1	0	0	0	0	0
10	Galama	*Anogeissus leiocarpus*	0	0	0	0	0	0	0	0
11	Iri cunamani, Sa irini, Sumaya irini	*Azadirachta indica*	0	0	0	0	0	0	0	0
12	Zekené	*Balanites aegyptiaca*	0	0	1	0	0	0	0	1
13	Gessemé, Shiflé irini	*Bauhinia rufescens*	0	0	0	0	0	0	0	0
14	Diafarané	*Bixa orellana*	0	0	0	0	0	0	0	0
15	Bumbu	*Bombax costatum*	0	0	0	0	0	0	0	0
16	Sebé	*Borassus aethiopium*	0	1	1	0	0	0	0	0
17	Fogo fogo	*Calotropis procera*	0	0	0	0	0	0	0	0
18	Ndi	*Capparis sepiaria*	0	0	0	0	0	0	0	0
19	Mandjé	*Carica papaya*	0	0	0	0	0	0	0	0
20	Sinjan	*Cassia sieberiana*	0	0	0	0	0	1	0	0
21	Bana, Bané	*Ceiba pentandra*	0	0	0	0	0	0	0	0
22	Gamiah	*Celtis integrifolia*	0	0	1	0	0	1	0	0
23	Leburu kumuni	*Citrus limon*	0	1	0	0	0	0	0	0
24	Leburu ba	*Citrus sinensis*	0	0	0	0	0	0	0	0
25	Irini blé, Tangara	*Combretum glutinosum*	0	0	0	0	0	0	0	0
26	Golobé	*Combretum micranthum*	0	0	0	0	0	0	0	0
27	Dugura	*Cordyla pinnata*	0	0	0	0	0	0	0	0
28	Balembo	*Crossopteryx febrifuga*	0	0	0	0	0	0	0	0
29	Toubabou Néré	*Delonix regia*	0	0	0	0	0	0	0	0
30	Sunsu	*Diospyros mespiliformis*	0	0	0	0	0	0	0	0
31	Matolatun irini	*Eucalyptus camaldulensis*	0	0	0	0	0	0	0	0
32	Sinjiba	*Euphorbia balsamifera*	0	0	0	0	0	0	0	0
33	Balanzan	*Faidherbia albida*	0	0	0	0	0	0	0	0
34	Djatigifa iri, Zeré, Zerenijé	*Ficus iteophylla*	0	0	0	0	0	0	0	0
35	Gaba	*Ficus platyphylla*	0	0	0	0	0	0	0	0
36	Toro	*Ficus sycomorus ssp. gnaphalocarpa*	0	0	0	0	0	0	0	0

Results : Relationship between functions and species

Production functions in Tiby (Clinquart et al, in prep)

Production functions	Human food	Animal feed	Firewood	Timber	Income	Human pharmacopeia	Animal pharmacopeia	Various domestic uses	Magic-religious uses
Number of species	32	46	49	35	42	55	14	17	8

Results : Relationship between functions and species

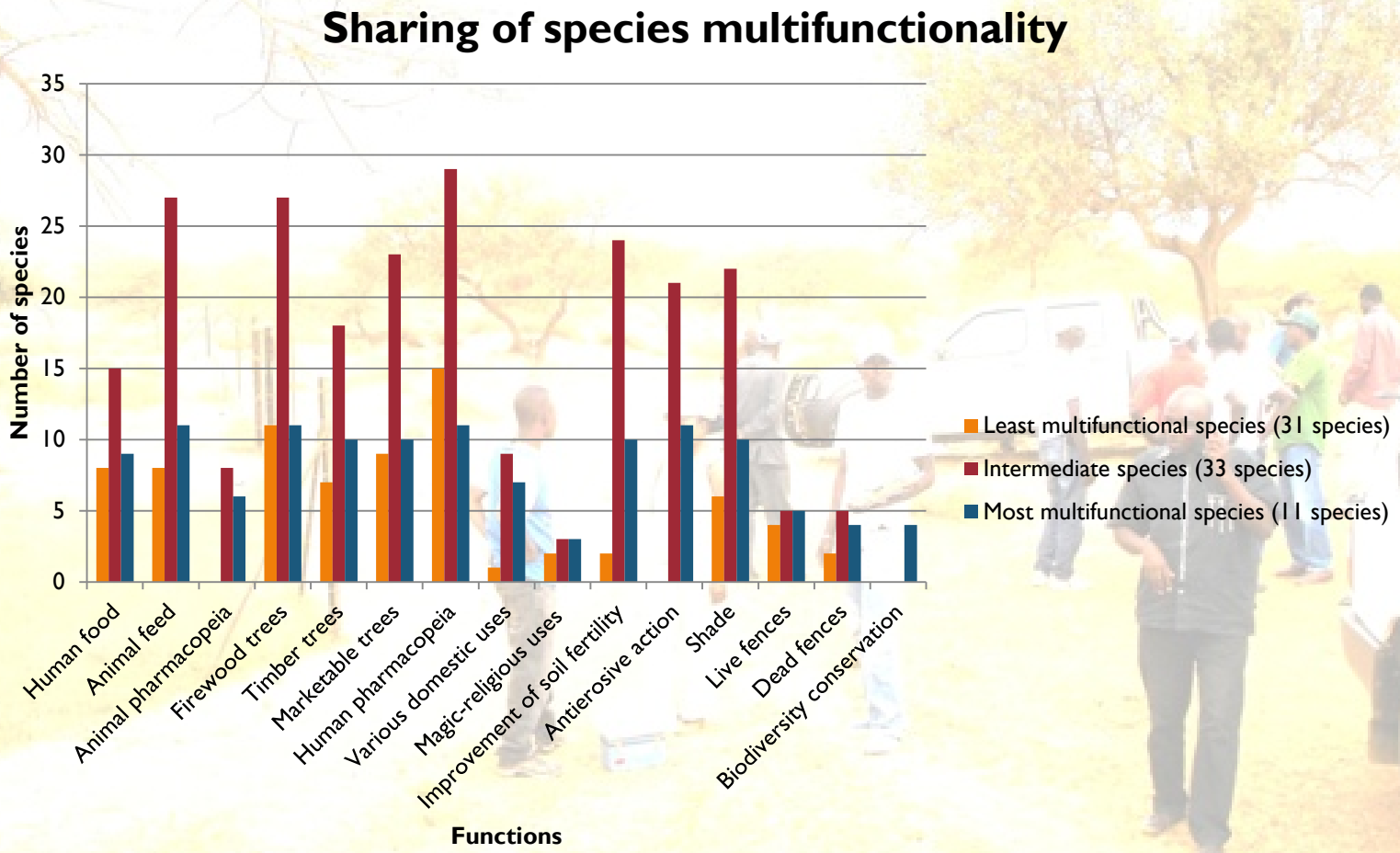
Support functions (Clinquart et al, in prep)

Support functions	Improvement of soil fertility	Antierosive action	Shade	Live fences	Dead fences	Biodiversity conservation
Number of species	36	32	38	14	11	4

Socio-cultural functions

Socio-cultural functions	Land mark	Patrimony	Esthetic
Number of species	21	10	2

Results : Multifunctionality of species



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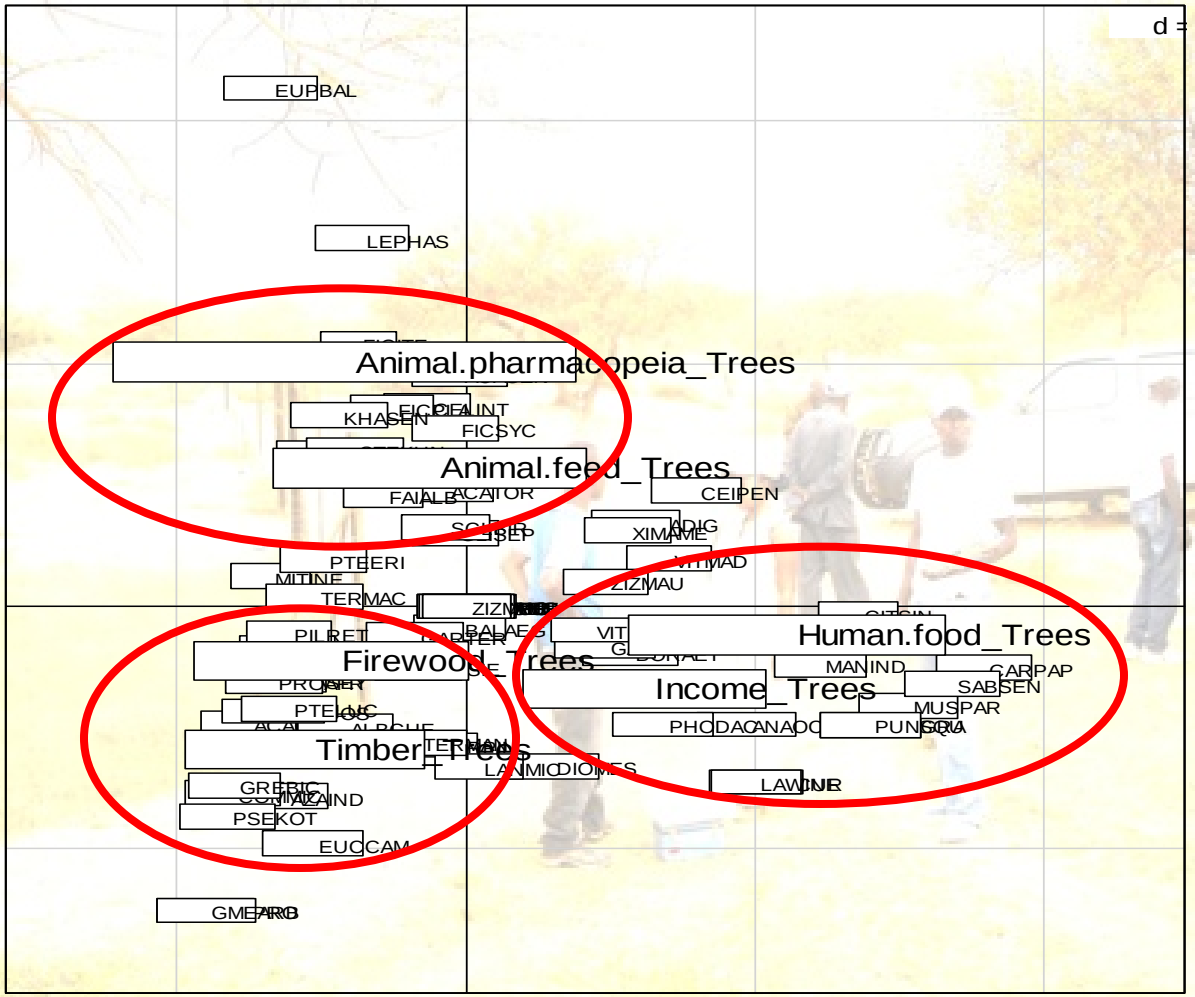
Results : Relationship between functions and species

Unifunctional species (Clinquart et al, in prep)

Unifunctional species	Function fulfilled
Acacia colei	Firewood
Bixa orellana	Domestic use (food condiment)
Carica papaya	Human food
Delonix regia	Shade
Gmelina arborea	Timber
Maerua angolensis	Human pharmacopeia
Maytenus senegalensis	Human pharmacopeia

Results : Functional groups



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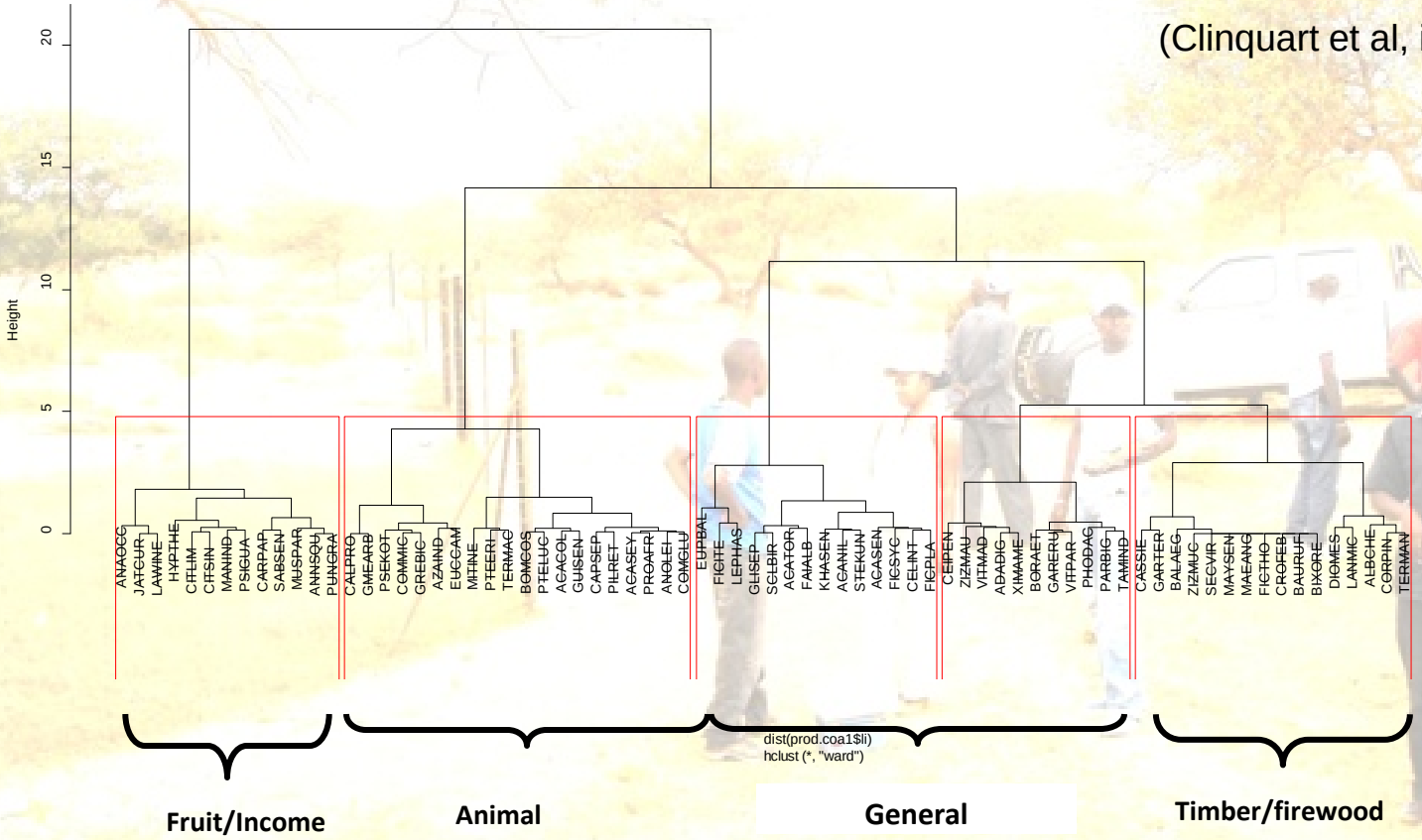
Results : Identification of functional groups

Figure 5: Hierarchical classification resulting of the COA concerning production functions of tree species according to farmers in Tiby (Mali)

(Clinquart et al, in prep)



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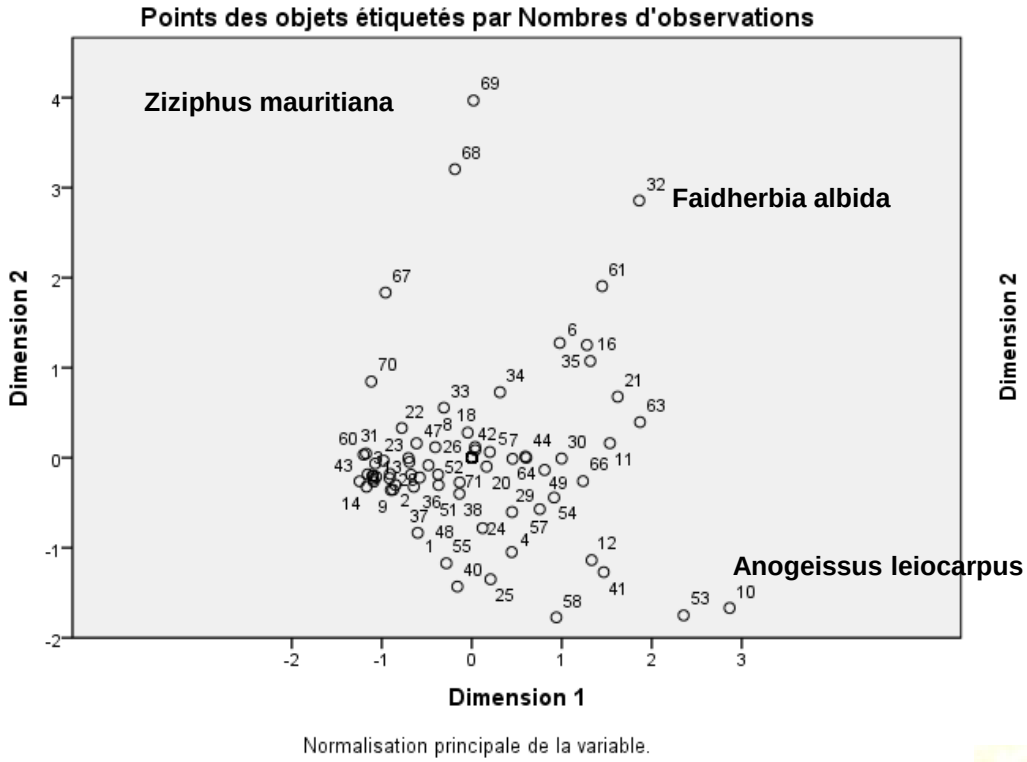
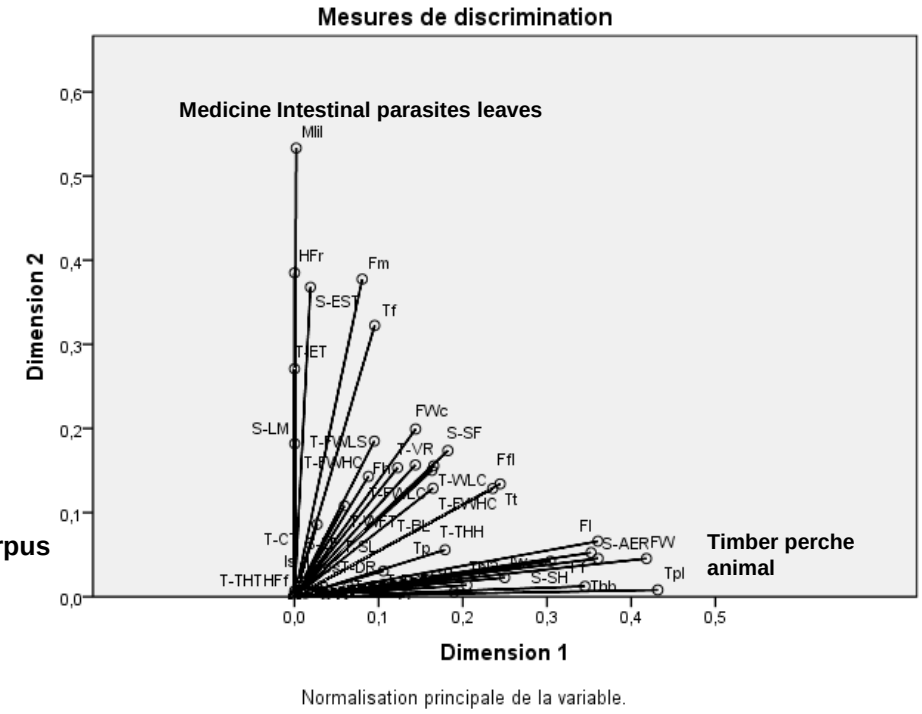
Results : Functional groups

Relations between traits and funtions and functional groups





CONCLUSION : FUNCTIONAL GROUPS ACCORDING TO FARMERS PERCEPTIONS OF TREE SPECIES AND THEIR TRAITS

- Important and diversified local needs from trees
- Many functions and multifunctional trees but some are more looked for
- Some functions relate on few species (cultural)
- Change of species when overexploited
- Relevant traits/functions need to be well understand
- Integrate local knowledge in AF Ingeneering