Introduction

Site characteristics (Faidherbia region):
- Poorly drained soil
- Unstable rainfall
- Frequent fires
- Limited ground cover

Relevant institutions:
- In order to improve the sustainability of wood and biodiversity, the Farm-Environment-Ecosystems Management (FEM) project has attempted to combine the management of biodiversity in the region since 2006 by excluding the expansion of monocultures.

The FEM project has focused on the agroforestry potential, although farmers have already been growing agroforestry practices in Cameroon for several decades.

Since many farmers have now managed to extend and enrich their parklands, it has been decided to boost the project's usefulness.

Objectives of the research:
- To assess the impact of the FEM project in terms of extension
- To qualify and demonstrate the potential of the parkland
- To assess the factors for managing this resource, which depend on seasonal and local factors.

Land use: multipurpose agroforestry parklands

Tropical farmers have been building up woodlands for more than a century. These woodlands are often managed as a whole.

- Village territories are defined as such
- Farmers' activities include both forest and agricultural management
- Trees are used both for firewood and agricultural shade
- Since the 1980s, population growth and the spread of cotton and sorghum have led to woodland degradation
- Until the 1990s, ecologists' national policies remained general guidelines, and local farmers had little control over the cutting or management of wood.

Research actions:
- Since 1999, research has highlighted the value of local agroforestry practices
- A survey of farmers activities
- A study of young cotton and forest practices (Lalami C. and Engui G. O., 1998)
- In 2004 the FEM project attempted to increase the forested areas in zones with Faidherbia albida. Progress was limited by the lack of action in these areas.

New issues for research and development:
- How can we extend expansion practices over the population's largest territories?
- Can the expansion of parklands be sustainable and what impact is it likely to have on the FEM project?
- How can we encourage participation and cooperation among farmers?
- How can we encourage local farmers to adopt and improve tree management?
- How can we encourage rural, low-income people living in underdeveloped agroforestry landscapes to make permanent changes in their conservation activities?

The results of the research of the ENGREF-CIRAD-IRAD-PRASAC team, 2003-2004

The study showed that:
- 1/ Farmers have a solid understanding of tree and parkland management:
  - Faidherbia is valued for its multipurpose ecosystem: fruit, firewood, poles, timber, fuelwood, etc. Farmers, indeed, prefer to use their trees throughout their development cycle.
  - The farmers are aware of the importance of pollarding, although the frequency of pollarding is uncertain.
  - The farmers have not only been trained on pollarding but have actually trained themselves in this way.
  - Faidherbia has been grown since 1996 by subsidising the retention of new trees.
  - The wood pollarding biomass table for Faidherbia albida was developed and was used to quantify current firewood resources of the parklands.

- 2/ Tree retention and increasing the area of parkland lead to two types of parkland:
  - One is old (10-15 years) and has a low wood needs for management, but it is easily rejuvenated by clear-cuting every 40 years (2002). Farmers can use it to cultivate on the reserve in this period.
  - The other is young (6-10 years) and has a future but needs to be managed. Indeed, its density is currently so high in some places (200/ha) that farmers will not be able to cultivate on the reserve for a few years.

- 3/ Siestock table: meeting firewood needs:
  - Faidherbia trees were counted and pollarded according to the same forest management and pollarding system
  - The trees were measured at 1.3m height, cut, and weighed to determine the weight of wood produced from pollarding. The results show that the wood production is low but on the reserve it is documented to be higher the productivity of young trees. Pollarding system and management should be improved by farmers.

- 4/ The issue of tree appropriation rights:
  - To maintain the management of local, farmers have been forced to adapt their exploitation system and to adopt the FEM project.
  - However, the next steps towards sustainable parkland management must be:
    - Institutional action based on incentives for farmers can thus sustain agroforestry systems in African savannahs, thereby increasing wood, crop and cotton production, biodiversity and even carbon storage.

Discussion

There are several reasons for the success of this extension project:
- A strong support from the local and national government agencies.
- The extension of a project supported by farmers who already have the capacity to extend it.
- The study showed that the management of new parklands is sustainable only if farmers are well informed and trained in parkland management.
- The future development of the positive trend that has been achieved in the parklands of the Tupuri villages now depends on:
  - Formalising an agreement with the local Forestry Administration on how to regulate and control tree cutting or pollarding by farmers, so as to ensure a sustainable and locally acceptable cultivation system.
  - Institutional action based on incentives for farmers can thus sustain agroforestry systems in African savannahs, thereby increasing wood, crop and cotton production, biodiversity and even carbon storage.

Conclusions

In the Tupuri area, more than 100% increase in the area over the last few years. In the future, this will depend on the changes in the local and national government agencies.

- Preparation of a wood pollarding biomass table for Faidherbia albida
- Clear-cutting and pollarding in the same area
- Extension of tree management
- Extension of the pollarding biomass table
- Economic benefits of pollarding and management
- Faidherbia rights on land

Bibliography

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Résumé :

In the sudano-sahelian zone of North-Cameroon and for more than a century farmers have been building multipurpose agroforestry parklands, which are either cropped, under fallow, or grazed, and provide various products. Until the 90’s, technical advisory structures have ignored these parklands, and even encouraged tree clearing from field, for trees hamper animal draught or mechanical tillage for cotton cultivation. From 1985 onwards research stressed the interest of local agroforestry species; but only in 1996 did the DPGT (Farmer’s Development and Territory Management) project attempt to induce tree (Faidherbia albida, Prosopis africana) resettlement in the fields, by subsidising retaining of every new tree. The study shows that farmers hold firm knowledge of tree and parklands management, and that tree retaining and parkland area increase. However, this evolution hangs on the ability of local organisations to take over from DPGT for subsidy management and to reach agreement with the Forestry Administration on how to rule and control tree cutting or pruning by peasants. Tree management will be improved by: (1) pursuing research on thinning, pruning and cutting practices and supporting it by modelling of dynamics of village tree resources, and (2) considering parklands as part of community forests in order to transfer management responsibility to local population, like the forest law allows it. Institutional action based on incentives to farmers can thus sustain agroforestry systems in African savannahs, thereby increasing production, biodiversity and even carbon storage.