

»» KfW Development Bank

Sustainable production of wood energy

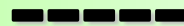
Experiences from Madagascar

Frankfurt, 02.03.2016

KFW



Afforestation at village level in Madagascar



Programme de Lutte Anti Erosive Madagascar





OBJECTIVE

Farmers, organised in groups, manage sustainably wood energy plantations and erosion control measures in the project regions on the basis of secured land use rights.

Indicators :

- a) 90% of measures implemented and land use plan agreements respected
- b) Establish conditions for an increase of the farmers' income (20% p.a)



Results

R1 –
Afforestation and its management

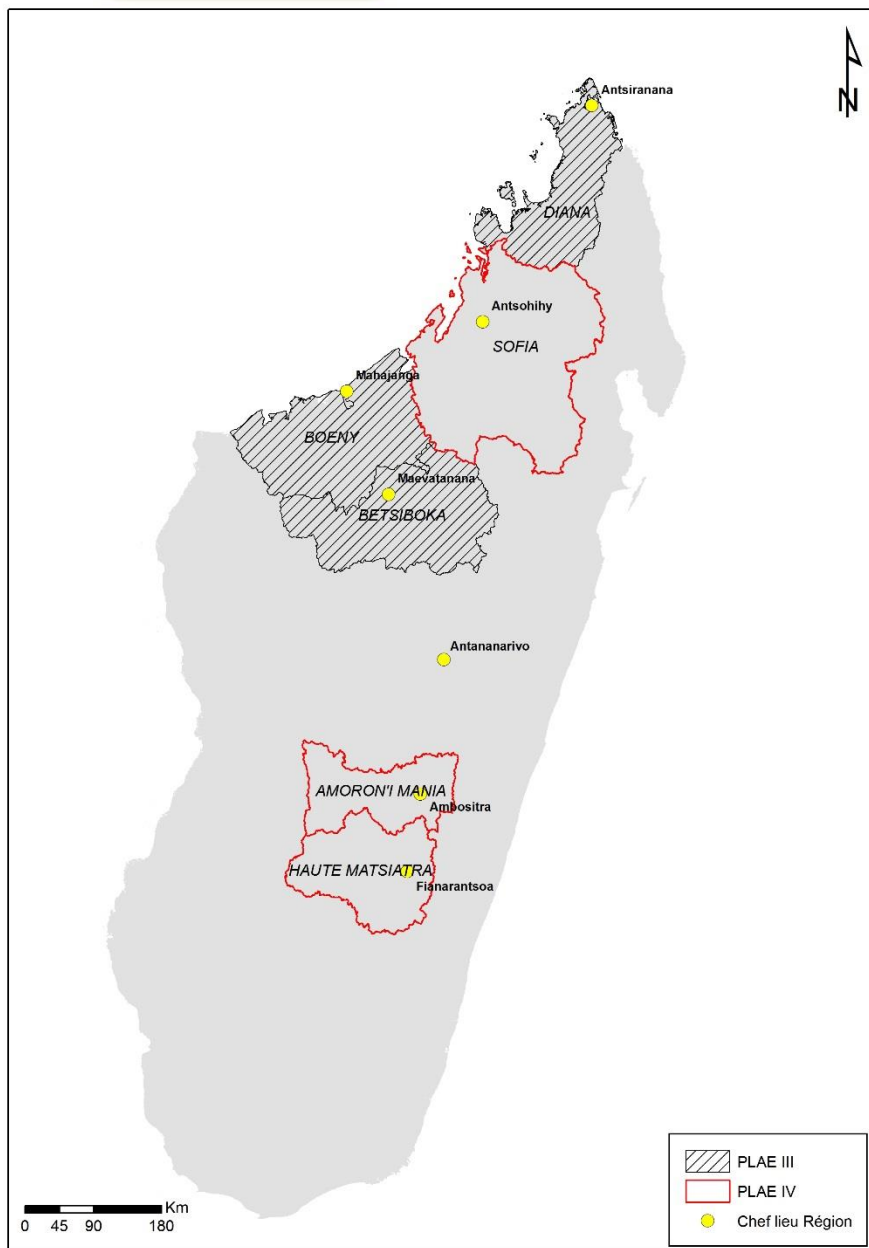
R2 –
Anti-erosion control measures
implemented

R3 –
Land use rights assured through certificats at communal level

R4 –
Socio-organisational structures are operational



INTERVENTION AREAS OF PLAE



Afforestation areas for three projects:

| Project name | afforestation area (RVI) | from | to |
|--------------------|--------------------------|------|------|
| PLAE III | 4.500 ha | 2014 | 2018 |
| PLAE III extension | 5.000 ha | 2016 | 2019 |
| PLAE IV | 6.000 ha | 2016 | 2020 |
| | 15.500 ha | | |

repartition by region

| | |
|-----------------|-----------|
| DIANA | 3.600 ha |
| Boeny | 4.400 ha |
| Betsiboka | 1.500 ha |
| Sofia | 3.000 ha |
| Amoron'i Mania | 1.500 ha |
| Haute-Matsiatra | 1.500 ha |
| | 15.500 ha |



DEMAND

In Madagascar, 90% of household energy is obtained from fuelwood and charcoal. In the urban centres, 80% of the population utilizes charcoal for domestic purposes.

The urban centres in the project regions such as Mahajanga (capital of Boeny Region) or Antsiranana (capital of DIANA Region) or the touristic centre of Nosy Be Island (DIANA Region) with an estimated consumption of 102 kg charcoal per person and year are the centres of demand.

In DIANA Region an annual demand of 30,000 t of charcoal was calculated.

The consumer prices for charcoal fluctuate significantly according to the season and the related transport conditions. In rainy season, when roads are difficult to pass, the consumer usually has to pay twice the price compared to the dry season. Therefore the afforestation areas are preferably selected along the axes of transport.



APPROACH

PLAE had adopted an approach developed by the technical cooperation project GREENMAD:

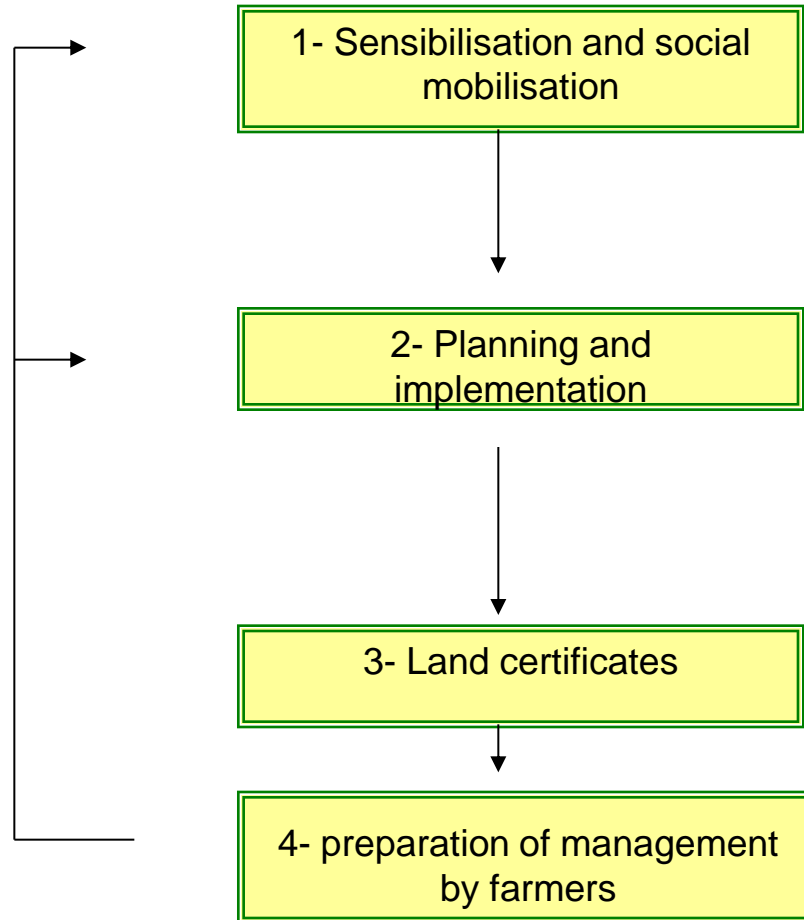
- villagers join voluntarily the afforestation groups
- individual farmers are the direct beneficiaries
- activities in the field (technical advice and land preparation) are carried out by service providers such as small companies, local NGOs (sometimes to be created).

PLAE refined the approach by:

- integration of anti-erosion measures in the afforestation areas
- diversification of tree species (in the last planting campaign only 60 % was Eucalyptus)
- afforestation also on slopes (20% of total area to be planted) with manual preparation of soil
- land certificates for all afforested areas



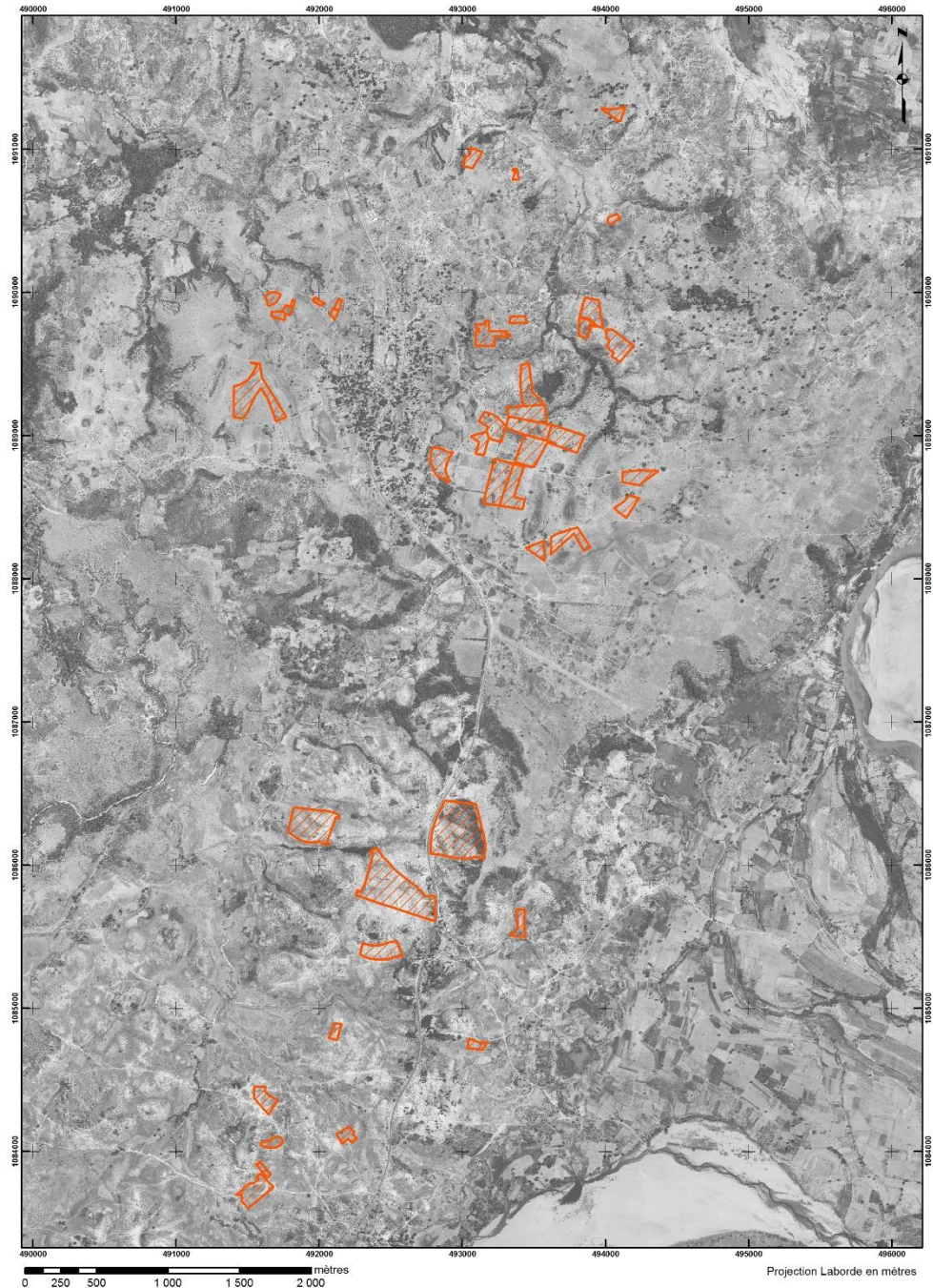
PROCEDURE



1- Sensibilisation and social mobilisation

- Information meetings and sensitization of local authorities (communes, Fokontany), and of the local population. Objectives and approach should be known by a broad public.
- Identification of afforestation areas:
 - Registration of plots at the level of councils
 - Delimitation of plots to be afforested by campaign
 - Verification of tenure
 - Resolution of the council concerning utilisation of land to be afforested documented in a decree.
- Creation of afforestation groups
- Conclusion of contracts for afforestation (among the group, the council and the forest administration)

Result of
delimitation
analysis –
available
plots for
afforestation



2- Planning and implementation

- participative diagnoses, also concerning erosion problems
- planning of activities
- installation of permanent demonstration and observation plots for the *farmers' field school* approach as well as for M&E
- technical and organisational training during accompanying afforestation groups
- production of plants



2- Planning and implementation

- Land preparation : contour ploughing or digging of individual planting holes on slopes



ploughing



subsoiler

- Tree planting and installation of anti-erosion measures



3- Land certificates

- Subdivision of afforested area among individual farmers
- Mapping of afforested plots
- Support for farmers in the process of land certification
- Where necessary, support for establishment of certification offices at council level

4- preparation of management by farmers

- Enhancement of competences
 - Technical, mainly in management and protection of plantations
 - Socio-organisational
- Maintenance and protection against fire: replanting, weeding, opening of fire protection strips, sensitization concerning fire protection

»» Key features of approach and factors of success

Ownership through individual land use certificates

Combination with erosion control measures and conservation agriculture

Subsidies for installation of plantation

Organisation of value chain after harvest → GIZ

Stable demand and no overwhelming competition from other (illegal) sources

Rentability assured with first harvest after seven years

(IRR: > 15% considering only technical costs,
> 5 % considering total costs)

Further positive impact already through increased agricultural income

»» Limitations for upscaling and replication

Production conditions where demand is located (precipitation, soil quality)

Afforestation appreciated where alternative land use is not possible

Land tenure situation

Availability of labour during planting period (mechanization)

First real income after 7 years

How to compete against illegal production on the market

Small scale approach with huge project overheads

»» Some figures

Project costs approx € 6 million for 4.500 ha. Total costs per ha afforestation approx.€ 650/ha.

| Project cost structure | % |
|-------------------------|----|
| Direct costs | |
| Afforestation | 20 |
| Anti erosion measures | 10 |
| Land certificates | 8 |
| Management costs | |
| Installation, equipment | 5 |
| Running costs | 11 |
| National staff | 20 |
| Experts | 17 |
| Unforeseen | 9 |

| Composition of direct costs (aprox 200 € / ha) | % |
|---|----|
| delimitation of land | 1 |
| land preparation | 45 |
| nurseries and transport | 21 |
| planting | 4 |
| fire protection | 2 |
| training of groups | 27 |

| [EUR] Boeny | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| coûts de gestion | 111,43 | 111,43 | 111,43 | 111,43 | | | | | | | | | | | | | | | | | | | | | | | |
| coûts techniques | 205,41 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 | 5,19 |
| recette | 0,00 | 0,00 | 0,00 | 0,00 | 46,32 | 46,32 | 312,62 | 0,00 | 0,00 | 0,00 | 82,72 | 279,13 | 0,00 | 0,00 | 0,00 | 82,72 | 279,13 | 0,00 | 0,00 | 0,00 | 82,72 | 279,13 | 0,00 | 0,00 | 0,00 | 82,72 | 279,13 |
| cash flow annuel | -316,84 | -116,62 | -116,62 | -116,62 | 41,14 | 41,14 | 307,44 | -5,19 | -5,19 | -5,19 | 77,54 | 273,94 | -5,19 | -5,19 | -5,19 | 77,54 | 273,94 | -5,19 | -5,19 | -5,19 | 77,54 | 273,94 | -5,19 | -5,19 | -5,19 | 77,54 | 273,94 |
| cash flow | | -433,46 | -550,08 | -666,70 | -625,56 | -584,42 | -276,98 | -282,17 | -287,35 | -292,54 | -215,00 | 58,94 | 53,76 | 48,57 | 43,39 | 120,92 | 394,87 | 389,68 | 384,50 | 379,31 | 456,85 | 730,79 | 725,61 | 720,42 | 715,24 | 792,77 | 1.066,72 |

IRR: 7,9 Total costs 19,8 only direct costs

