

CASE STUDY OF INTEGRATED DEVELOPMENT AND MANAGEMENT OF IRRIGATION SCHEME

LAVAHELOKA IRRIGATION SCHEME

*Antsoha Community, District of Belo sur Tsiribihina,
Menabe Région*

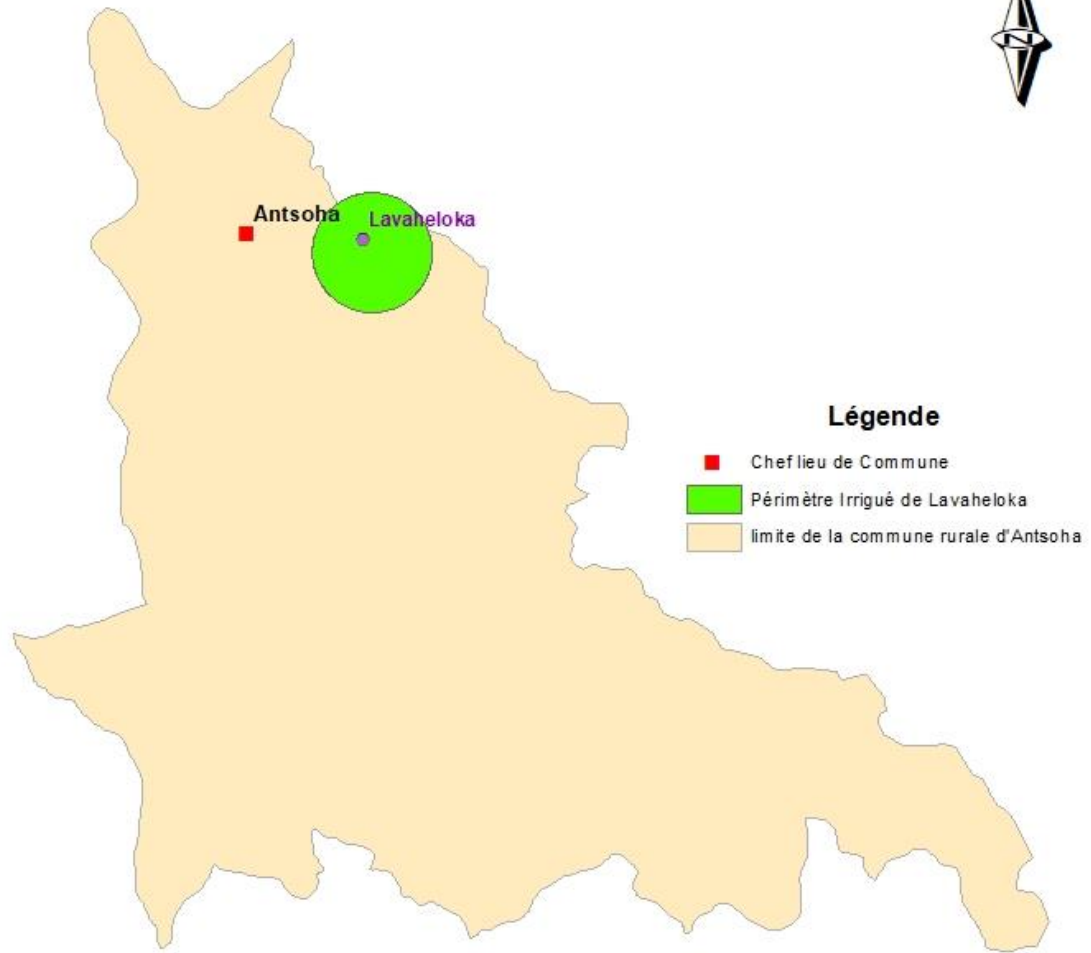
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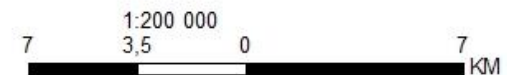
Location

CARTE DE LOCALISATION DE LA COMMUNE RURALE D'ANTSOHA ET DU PERIMETRE IRRIGUE DE LAVAHELOKA



Légende

- Chef lieu de Commune
- Périmètre Irrigué de Lavaheloka
- limite de la commune rurale d'Antsoha



Context

- **About the area of the case study**
 - Landlocked and sparsely populated
 - Existence of abundantly available land and water resources
- **About the local population before project**
 - Very poor and living in serious food insecurity
 - Vulnerable and making living by farm labor (outside their locality) in the majority of cases
 - Not practicing rice farming
- **About the development project**
 - New development project transformed cattle grazing area into irrigated rice fields
 - Funded by Emergency Fund for Food Insecurity and Resilience

Challenges

- Provision of sustainable solution to food insecurity to local population
- Land management: Equitable sharing of newly irrigated land with the immigrants who are attracted by the development of the area
- Agricultural development in the scheme with those who have not practiced irrigated rice farming and do not have necessary materials and equipment for rice production

Development of the irrigation scheme

Followed steps

- Identification / pre-feasibility study
- Detailed Pre-project Studies
- Construction work
- 1st plowing on the plots in the entire scheme

➤ **Identification**

- Based on the information extracted from the communal planning document
- Involvement of administrative and traditional authorities
- By the Rural Infrastructure Unit of the Project, with the support of a senior staff from the Ministry of Agriculture and a team of engineering staff from its decentralized structure

➤ **Detailed Pre-project Study (DPS)**

- DPS immediately conducted in the "emergency" context of the Fund that financed the development project
- Conducted by individual consultants

Development of the irrigation scheme (Ct'd)

➤ **Construction Works**

➤ **Implementation structures**

- ✓ Client : Ministry in charge of Agriculture
- ✓ Supervision : UGP AD2M
- ✓ Contractors : PME/BTP
- ✓ Beneficiaries: Carried out pruning work, clearing and digging of secondary and tertiary canals

➤ **Construction of Irrigation Facilities**

- ✓ Gravity irrigation with functional facilities
- ✓ Consisting of a diversion dam, a network of irrigation canals and other relevant facilities
- ✓ New facility at reasonable costs and easy maintenance for users
- ✓ Total cost of the works by the contractor (including taxes) :
- ✓ 941 560 000 MGA (= 294 000 USD)

Development of the irrigation scheme (Ct'd)

➤ **Construction of Irrigation Facilities (Cont'd)**

- ✓ Estimated contribution from beneficiaries: 4,000 USD
- ✓ Cost of facility construction : 750 USD per hectar
- ✓ Area cultivable after construction: 400ha in the cropping season and 100ha in off season
- ✓ Beneficiaries: 372 households (about 2,230 people) including 104 households headed by women
- ✓ Date of handover of the scheme: 29/08/2011

➤ **Management of Irrigation Network: Water Users Association (WUA)**

- ✓ WUA was organized while facilities were being constructed
- ✓ Participated in the development works and land sharings process
- ✓ Received technical and organizational training from the project

Land Management

- **Purpose:** Equitable sharing of newly irrigated land
- **Stakeholders**
 - Local administrative authorities:
 - ✓ Assume the role of trust building within communities
 - ✓ Involved in the formalization of consensus and decisions made by the community
 - Traditional authorities: leaders of ethnic sub-group
 - ✓ Have authorities to make decision over the allocation of plots
 - ✓ Encourage and ensure land sharing
 - Project staff: facilitators

Land Management (C'td)

- **The process:**

- Information sharing/ communication on land sharing
- Identification of Chief of ethnic sub-groups: 39 leaders of ethnic sub-groups identified
- Identification of beneficiaries / future users by ethnic sub-group ethnic, **prioritizing the most vulnerable ones (women and youth)**
- Awareness creation of the work among beneficiaries
- Mapping the irrigation scheme:
 - ✓ Subdivision of the scheme into as many sectors as many ethnic sub-groups
 - ✓ Allocation of subdivided sectors to ethnic sub-groups by drawing

Land Management (Ct'd)

- **The process (C'td)**

- Distribution of plots to beneficiaries who participated in the development works
 - ✓ Fair distribution of 1ha per household to the 261 households initially listed
 - ✓ Distribution of remaining areas, based on demonstrated capacity in land development
 - ✓ Possibility to call on new immigrants, left to the decision by each of ethnic sub-groups
- Securing land rights by certification
 - ✓ Issued after two years of development, to avoid acquisition of land for speculation purpose
 - ✓ Currently 449 land certificates issued and the land use at 372ha of land are secured

Operation and Management of the Irrigation Scheme

- **Operation and Management of the Scheme**

Operation and Management of the Irrigation Scheme are assured by :

- A management council constituted by :
 - ✓ members of WAU (elected)
 - ✓ leaders of ethnic sub-group
- An executive body composed of :
 - ✓ Elected members of WUA headed by a President
 - ✓ Committees (Works, Regulations, Communication)
 - ✓ Technical personnel for management such as one guard for water valves and five controllers of irrigation canals

Operation and Management of the Irrigation Scheme (C'td)

- **Daily operation**

Daily operations are carried out by the guard for water valves and five controllers of irrigation canals :

- The valve guard is responsible for opening and closing the main canal valves as needed.
- The controllers of irrigation canals are responsible for monitoring the irrigation canals to particularly ensure : (i) the proper distribution of water, (ii) no abuse in water use (iii) the good working state of irrigation canals

AD2M project provided technical (e.g. measuring the water flow, calculation of water intake) and organizational training. A manual for management and maintenance is provided to WUA. WUA members and technical personnel have been trained on this manual.

Agricultural operation of the irrigated land

- 1st plowing on the entire perimeter supported by the project to accelerate the development (agronomic) of the irrigated land
- Extension of Intensive Rice Culture System (SRI) techniques based on :
 - Selection of good seeds and Pre-germination before sowing
 - Use of single seedlings per hill
 - Transplanting (in line) of young seedling (5 to 10 days after sowing - 2 leaves)
 - Frequent weeding (10 days after transplanting, then 2 to 3 times every 10 days)
 - Control of the water level in each plot (should not exceed 10 cm deep. Dry up plots completely 10 days before harvesting)
 - Apply “Assec” : which consist of drying each plot after each weeding (duration : 1 or 2 days).
 - Square planting (spacing of 25cm x 25 cm)
 - Use of adequate fertilizer (depending on variety and soil characteristics) and crop rotation with rice and leguminous crops (such as beans, ...)

Agricultural Operation on the Irrigated Land (C'td)

- **Extension approach for SRI techniques:**
 - **Create favorable environment for SRI**
 - ✓ Water control through construction of irrigation scheme
 - ✓ Land security to encourage investment
 - **Remove farmers constraints by**
 - ✓ Material support to relieve physical burden in farm labor
 - ✓ Close and intensive support: organization and operationalization of WUA, training on the management of irrigation facilities, training on improved agricultural techniques, advisory support on technical, economic and organizational aspects
 - **Share risks with farmers** by subsidizing some inputs such as seeds, pesticides, ...
 - **Encouragement and awareness creation**

Agricultural Operation on the Irrigated Land (C'td)

- **Extension method: Farmer Field School**
 - Organization of groups of about 25 farmers each
 - Establishment of demonstration and training plots and preparation of plots with conventional methods for comparison
 - Series of technical and organizational trainings
 - Taking into account the economic dimension (profitability)
 - Practice by individual members on their own plots
 - Support in seeds and agricultural equipment
 - Close supervision by technician
 - Organization of visit/exchange on the most successful plots

Improving Access of Production Areas

- **Comprehensive project approach:** prioritization of fluvial way by building jetties along the river
 - Already exploited by local people residing along the river
 - Distance and cost of transportation are reduced compared to the ordinary roads
 - Lower development cost and easier maintainance compared to the ordinary roads
 - Practically accessible all year round while roads are usable only 7 months a year
- However, this irrigation scheme is still rather landlocked because of its remoteness from both the river and the functional road networks.

Results and Impacts

- 372 households acquired the access to newly irrigated land
- Possibility of double cropping (**two crops in a year**)
- Adoption of improved techniques by practically all of the beneficiaries, since rice is a **new crop**
- Average rice yield of **4,5t/ha**
- Additional production of **2,250 tons of paddy per year**
- Operation and management of **WUA, matured and advanced**

Key Success Factors

- Gravity Irrigation with functional facilities giving a low development cost per hectare
- Quick interventions: notification of funding in August 2009 and announcement for the launching of works in December 2009
- Strong involvement of beneficiaries and local authorities (administrative and traditional), especially for land issues
- Effectiveness of WUAs for irrigation management
- Integrated activities: Construction of facilities-agricultural development-land management
- Existence of a multidisciplinary team of consultation/advisory support and close supervision (socio-organizers, agricultural technicians, Rural Engineering technicians)

Key Success Factors (C'td)

Advisory and close support were provided to beneficiaries by NGOs in the field, with a multidisciplinary team composed of:

- a Senior Coordinator responsible for the socio-organization,
- an Assistant Coordinator, agronomist
- a pair of Socio-Organizers
- an Agricultural Technician
- a Technician in Rural Engineering

Sustainability and Threats

- Additional works to be carried out as part of Phase 2 of AD2M to improve the efficiency of the irrigation system that was laid out as part of an emergency operation
- Issues of growing rural insecurity (thefts of cattle) jeopardizing animal traction, the safety of producers and their investments.



Overview of the irrigation scheme before the development (yellow outlines)



Diversion dam



Concrete work of main canal



Soil preparation



Transplantation



First plowing



Training of WUA members



Land certificate delivered by the Mayor
(right)



Certified plots in the scheme

ARIGATO GOZAIMASU !