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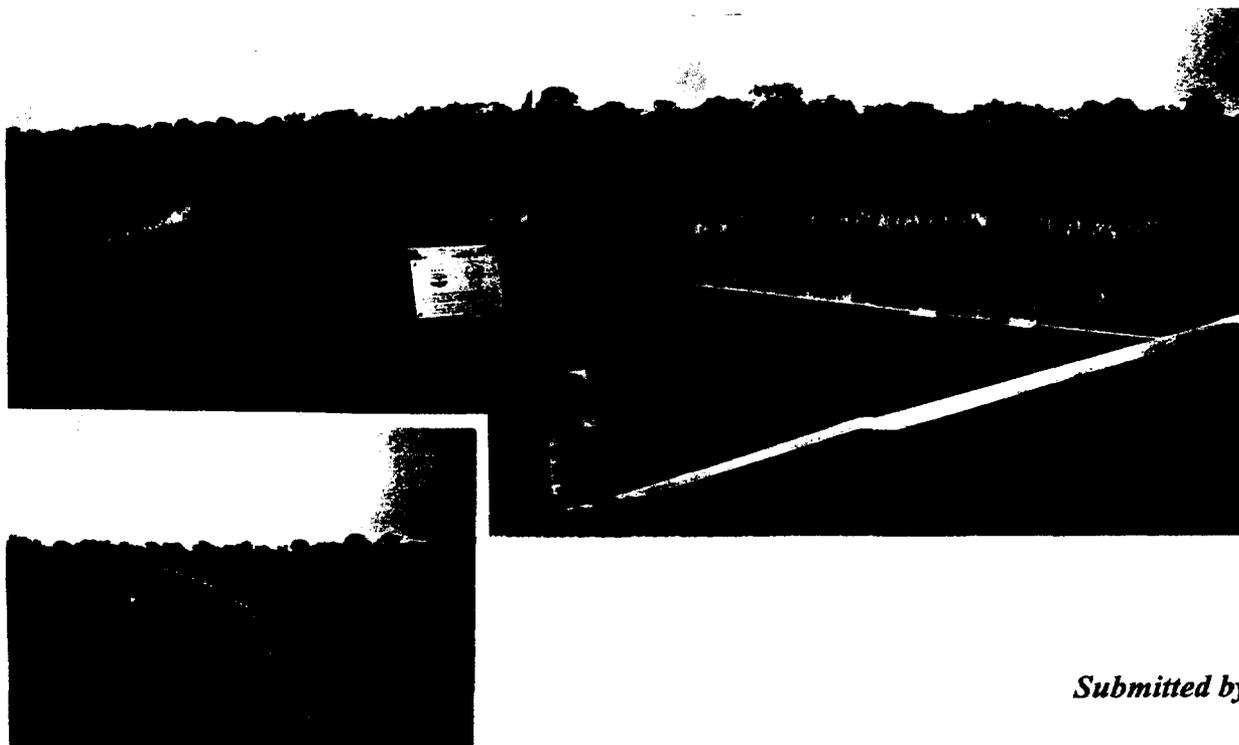
REPUBLIQUE DU SENEGAL

MINISTERE DU DEVELOPPEMENT RURAL ET
DE L'HYDRAULIQUE

MINISTERE DELEGUE CHARGE DE L'HYDRAULIQUE
DIRECTION DU GENIE RURAL ET DE
L'HYDRAULIQUE

**SOUTHERN ZONE WATER MANAGEMENT
PROJECT (SZWMP)**

FINAL REPORT



Submitted by:

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EXECUTIVE SUMMARY

The Southern Zone Water Management Project (SZWMP) aims to increase cereals, mainly rice production through improved water control and management in the Ziguinchor and Kolda regions. The project grew out of a need to address the loss of cultivated rice lands to saline and acid conditions, due to the combined effects of tidal flooding and reduced rainfall.

The SZWMP addresses this problem by installing water control structures to manage the fresh water runoff from rainfall and the participatory involvement of the beneficiary population to ensure sustainability. The planning unit for improved water management is a watershed or valley, wherein three types of water management structures are envisioned:

- Anti-salt dikes, for areas directly influenced by salt, close to the tidal river;
- Water retention dikes, for areas upstream not directly affected by salt, but susceptible to water shortage;
- Contour berms for areas further upstream and also not influenced by salt, but could also benefit from soil and water conservation structures.

Louis Berger International, Inc. (LBII) was engaged to provide technical assistance and related services in the implementation of the project from June 1990 - December 1995. LBII has two U.S. based subcontractors, Louisiana State University and Tech International. LBII also recruited and trained local subcontractors and grantees for construction, technical studies, evaluation, applied research and support services. LBII worked closely with USAID and a Project Management Unit (PMU), consisting of a National Project Director and personnel seconded from the Ministries of Agriculture and Hydraulics.

SZWMP aims to develop an approach to watershed management and planning that could be replicated in as many as 60 valleys and recover about 15,000 hectares through 1999. During the course of this five-year contract period (1990-1995), the PMU established a target of 24 valleys covering a total area of 11,600 hectares. This would be accomplished through four annual work plans. As of December, 1995, the project achieved the development of 22 valleys covering an area of 10,200 hectares. Detailed design and plans have been achieved for three other valleys, which can provide the basis for further development.

The program trained local PMU staff who would continue the work after the termination of the LBII's involvement, and established standardized planning, design and construction procedures to facilitate the work of the local contractors as well as that of the PMU planning/design organization. In addition, the program trained local farmer committees for the successful operation and maintenance of the water control facilities.

The program was divided into the following major activities:

- Valley Selection and Preparation
- Construction
- Demonstration and Applied Research
- Maintenance, Agricultural Extension and Monitoring

The selection process involved a series of initial meetings with the populations and accompanied by numerous engineering, agronomic and social surveys. Valleys were recommended for selection based on a weighted ranking scheme involving three principal disciplines: rural engineering, agro-pedology and sociology.

The planning of infrastructure involved preliminary and detailed design studies. The preliminary design studies included basic hydrological, topographic and soils information. An analysis was made of alternative development schemes and recommendations made on technical grounds, social considerations and cost-effectiveness. LBII developed standardized engineering designs over the course of the project. Similarly, standardized contracting procedures were developed for prequalification and tendering.

Over its five year life, project management was plagued by security difficulties in the Southern Zone. During the first two years, this led to the exclusion of the project from the Ziguinchor Region; thus, Program I focused entirely in the Kolda Region. Security problems reached their height in late 1992, when the entire LBII team was evacuated from Ziguinchor to Banjul, then to Kolda. Although the team returned to Ziguinchor, security restrictions continued to the end of the project period, particularly south of the Casamance River. These security problems brought about additional contract costs and led to numerous disruptions and logistical challenges in the implementation of the program.

From a technical standpoint, the project's approach to implementation evolved from the process originally specified in the Project Paper. The initial approach was to carry out the placing and compaction of material for the earthworks *gratis* by the villagers. This formula, although in theory less expensive, was found to be impractical, due primarily to: (I) the magnitude of the earthwork requirements; (ii) the difficulty in ensuring appropriate compaction standards utilizing hand labor; and (iii) the resistance of the villagers and their inability to provide the required manpower. Based on this experience, the project determined that earthworks would be carried out mechanically by the contractors, while certain tasks, such as gathering and placing of riprap, would be reserved for the villagers. Villagers were paid an indemnity for their work on the dikes, which provided the basis for a revolving fund to be used for the operation of the water control facilities and agricultural support.

A second area of evolution was the realization that the original level of effort, in terms of staffing and funding was inadequate to achieve project objectives. As a result, several contract modifications were effected. These included: (I) the addition of an NGO component for day-to-

day extension and support in the valleys; (ii) the reinforcement of local staff with site construction supervisors, a local accountant, a training/NGO supervisor and a monitoring and evaluation specialist; (iii) increased level of effort for technical and home office support; and (iv) increased funding required to complete construction, particularly in the areas of engineering design, environmental research and monitoring. A summary of contract modifications are presented in Section 7.

The project implemented 59 construction contracts with 13 contractors. Dollar expenses incurred depended on the current exchange rate. The estimated total cost of construction contracts for the dikes is \$3.6 million. This resulted in the construction of 24 anti-salt dikes and 30 water retention dikes, covering a length of 26 kilometers.

The initial valley development plans prescribed low rise contour berms. During the first four years, however, the major efforts of the project and the villagers were devoted to construction of the anti-salt and water retention structures. In late 1994-95, the project engaged a soil and water conservation specialist to promote complementary soil and water conservation measures. This resulted in a pilot demonstration for improved contour berms and provided the basis for a Contour Berm Manual now being applied in the project valleys.

A Water Control Facilities Operations and Maintenance Manual was also developed, which is being applied in the valleys as the works become operational. An individualized manual is being adapted in each valley, based on a model developed for two valleys. The process of land reclamation in relation to the management of water levels involves the reduction of acidity and prevention of oxidation by maintaining anaerobic action. The key element in this process is to maintain moisture in the soil for the longest possible period, including salty water during the dry season.

The beneficiary participation and extension approach adopted by the SZWMP was to first, put in place demonstration plots (*parcelles pilotes*) using currently confirmed techniques; then to provide a training and extension framework with the village committees organized by the project staff in each valley. The plots were located on various soil and water management conditions, and served as important focal points for extension, village organization and field days among the different valleys. Sixty-eight plots were established through 1994, and about an additional 20 were established in 1995.

Because of limited farm resources and credit availability for chemical fertilizer, programs for the development of compost were carried out in 1994 and 1995, in collaboration with the U.S. NGO, Rodale. This program is receiving an enthusiastic response, and as of the beginning of the 1995 growing season, about 560 mature pits were available.

The Inter-Village and Village Water Management Committees (IVWMC and VWMC) comprise the fundamental organizational framework for improved soil and water management in the valleys. The project has organized 176 village water management committees, encompassing

183 villages. Four IVWMCs have become economic interest groups (*groupement d'interet economique -- GIE*), providing a broader range of support services for its members, including possibilities for access to production credit. The participating valleys are in the process of organizing a regionally-based Federation of Inter-Village Water Management Committees, which will strengthen the long term sustainability of these institutions.

An NGO program was developed in response to the problem of limited project human resources for continued on-site extension work in the 22 valleys. The NGOs provide an interface with rural communities for building sustainable rural economies, while maintaining contact with traditional GOS support services. In some valleys, the NGOs concerned are locally-based People's Organizations (OP). Nine NGOs/POs are working in the 22 valleys, with a total staff of 31 *animateurs*. They play a key role in implementing village participation in construction, organization of revolving funds, agricultural extension and water management.

The revolving fund program is now established in 22 valleys. Initial contributions were from the construction activities, however, sources have expanded to include collections, sale of membership cards, sale of tractor and other services, and sale of seed and other products from communal fields. Current savings total over FCFA 6.3 million.

A highly successful program, *Femmes et Formation en Gestion Appliquee (FEFGA)*, began with a pilot program in two valleys, which has expanded to 14 valleys in 1995. The program works through the village committees and focuses on building management skills for women leaders (not excluding men) for income-generating activities. Since its inception, 3,300 persons have participated in the program, over 75% of which were women.

The institution-building component of the project occurred through on-the-job training; formalized overseas long and short term courses; and in-country training and seminars. Training was carried out for three main beneficiary groups: Government of Senegal personnel; village organization; and the private sector. Long term degree training programs were designed to focus on professional skills and applied research topics required by the project. Four participants began training at Louisiana State University, although one candidate was terminated, due to non-performance. The remaining three will complete their Master's degrees in 1996. Areas of concentration are: Extension Effectiveness; Recovery of Acid Sulfate and Saline Soils; and Hydrological Monitoring.

Overseas short term courses focused on soil and water conservation (Burkina Faso), rice production (Cote d'Ivoire and Indonesia) and Management (University of Pittsburgh, U.S.A.), and involved 20 participants. The Indonesia activity involved two farm families and was followed by follow-up sessions in Senegal, involving 13 valleys and 610 participants.

In-country training and seminars involved a wide range of technical topics as well as project-related activities. Participants included SZWMP staff, Regional Inspectorates, NGOs and village committee members. In all, these programs involved 42 activities and 1,390 participants.

Examples include: information seminars for construction contractors, topography techniques, participative planning, computer skills, seed production, compost production, NGO collaboration and project assessments.

Village-level training encompassed the spectrum of planning and development programs occurring within the valleys. They included demonstration plots and organized field extension days, management of the water management structures, *FEFGA* training for women leaders and training in compost pits. Over 6,500 persons participated in these activities, 3,000 of which were women.

Also at the village level, Inter-Valley Visits were organized, which enabled the farmers with previous project experience to share their knowledge and experiences with farmers from valleys currently being planned. Sixty visits have been carried out, involving 1,244 participants.

An integrated monitoring, applied research and mitigation program was developed, based on a Programmatic Environmental Review (PER). The PER found that the main potential environmental impacts would be loss to fish habitat, but that other aspects ought to be studied. The program was carried out through a Cooperative Agreement with ISRA. It revolved around technical teams in the fields of soils/vegetation, agronomy/sociology, hydrology, fisheries, ornithology (birdlife) and health. Data was collected for one season, and preliminary findings showed relatively small environmental impacts at this early date in the existence of the new structures. Continued research is recommended in fish mitigation, soils and hydrology.

Research activities in hydrology will be partially covered by the project's hydrological survey in connection with implementation of the Water Management Manual. Complementary soil surveys could be carried out through a follow-up survey which would be compared to the baseline surveys in the valleys' preliminary design documents.

Project activity monitoring has been carried out through the creation of a Monitoring and Evaluation Unit, staffed by a local Social Scientist. During the final extension period, a management information system was conceived on a user-friendly data base format, with the assistance of a local computer firm. This was developed based on existing data and project tables and through consultation with PMU technical staff.

The Monitoring and Evaluation Unit has established a basis for assessing project impact through the implementation of two major surveys: (i) sample household survey stratified by ecological zone and the extent of water control; and (ii) annual census of rice fields and yields in the project valleys carried out by the Regional Inspectorates. The household survey for the 1994/95 has shown that impacts are uneven among the different zones, but when combined over zones, the impacts of water control tend to be in a positive direction, although not yet statistically significant. The 1995/96 survey has incorporated indicators of Natural Resource Management, in accordance with API indicators.

The 1994/95 survey will provide a good baseline for continued monitoring and assessment of the project's impact in the future. It is not unexpected that significant impacts were not yet felt 1994/95. The process of land reclamation is a medium to long term endeavor, and 1995/96 was the first season with a significant number of valleys under water control.

Perhaps the most significant measure of impact at this time is the enthusiasm that has been generated among the population. This is evident particularly during the Inter-Valley Visits, and the initiatives taken to organize the Federation of Inter-Village Water Management Committees.

Recommendations for future activities are made in the context of the 18-Month Work Plan. These focus on the continued valley-specific extension programs, which would work closely with the committees on the appropriate management of the structures, in connection with land reclamation activities. Continued support to the contour berm program and the application of the Contour Berm Manual is equally important to maximize the impact of the project on upland rice production and protect the water control structure investments in the long term.

**SOME KEY STATISTICS
SOUTHERN ZONE WATER MANAGEMENT PROJECT
1990-1995**

| | |
|--|--------|
| ■ Valleys Developed | 22 |
| ■ Beneficiary Population | 76,876 |
| ■ Beneficiary Villages | 183 |
| ■ Village Water Management Committees | 176 |
| ■ No. Dikes Constructed | 54 |
| ■ Kilometers of Dike Constructed | 26 |
| ■ Area of Valleys Developed (ha) | 10,198 |
| ■ Areas Directly Influenced by Dikes (ha) | 6,334 |
| ■ Water Deficit Areas Improved for Soil Conservation | 4,008 |
| ■ Demonstration Plots (thru 94) | 68 |
| ■ Compost Pits Usable in 95 | 560 |
| ■ Cultivated Area in 1994 (ha) | 4,864 |
| ■ Rice Production in 1994 (tons) | 5,313 |
| ■ U.S. Master's Degree Training (1996) | 3 |
| ■ Inter-Valley Visits Conducted | 40 |
| ■ Inter-Valley Visit Participants | 1,244 |
| ■ Women's Training Sessions (FEFGA) | 33 |
| ■ Women Participants in FEFGA Training | 2,426 |
| ■ Short Term U.S./Third Country Training Sessions | 10 |
| ■ Village Training Sessions | 59 |
| ■ Women Participants in Village Training | 3,078 |
| ■ Village Participation in Constr/Demonstr. (p-days) | 19,979 |

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1. INTRODUCTION

1.1 Project Goal and Purpose

The goal of the Southern Zone Water Management Project (SZWMP) is to increase cereals, mainly rice, production, in the Kolda and Ziguinchor regions. Original projections sought to increase the rice production in the project area by about 50 percent, from 54,000 tons of paddy rice in 1987/88 to 81,000 tons of rice in 1999.

The SZWMP aims to increase rice production through improved water control and management and beneficiary participatory involvement. After several decades of reduced rainfall, the Kolda and Ziguinchor regions have been losing cultivated ricelands due to tidal surface flooding of salt water from the Casamance River. The result of this action has been increased soil salinity and acidity.

The SZWMP addresses this problem by installing water control structures to manage the fresh water runoff from rainfall. The planning unit for improved water management is a watershed, or valley, wherein three types of water management structures are envisioned:

- Anti-salt dikes, for areas directly influenced by salt, close to the tidal river;
- Water retention dikes, for areas upstream not directly affected by salt, but susceptible to water shortage;
- Contour berms for areas further upstream and also not influenced by salt, but could also benefit from soil and water conservation structures.

The basic approach to the reclamation of salinized land is to control the runoff by storing fresh water behind earth dikes; to use the initial runoffs to flush the surface soil of salts at the beginning of the rainy season; and subsequently during the same season to store the water to permit cultivation of rice. The dikes are also used to maintain humid soil conditions in the dry season which, combined with soil manipulation and amendments, promote conditions necessary for preservation of potentially acid sulfate soils over a longer period.

By the end of the project, it was estimated that improved water management would occur in approximately 60 valleys, with 15,000 hectares fully recovered.

1.2 Project Organization

Project organization was defined in the Administrative Order dated March 6, 1991 (*Arrete Portant Creation, Organization et Fonctionnement du Project Gestion de L'Eau dans la Zone Sud du Senegal*). The organization has two levels:

- Field Organization and Structures
- Supervisory and Control Structures

1.2.1 Field Organization and Structures

The SZWMP is implemented at three levels:

- **Project Management Unit (PMU)**, based in Ziguinchor. The PMU consists of Government of Senegal (GOS) personnel seconded from the Ministries of Agriculture and Hydraulics, and the contractor personnel. The Ministry of Agriculture is the implementing ministry. Full time professional staff included:
 - National Project Director
 - Contractor Chief of Party
 - Contractor Rural Engineer
 - Contractor Sociologist
 - Contractor Agronomist
 - Contractor Administration and Finance Director
- **Two Regional Water Management Teams (RWMTs)**, based in the Ziguinchor and Kolda Regions. The RWMTs consist of Government of Senegal personnel seconded to the project from the Ministries of Agriculture and Hydraulics. Each team includes:
 - 1 Agronomist/extension agent
 - 1 Soil scientist
 - 1 Engineer
 - 1 Surveyor
- **Village and Inter-village Water Management Committees (VWMC and IVWMC)**, based in each valley where the project works, and through which the water management plans are planned and carried out.
- **Non-Governmental Organizations (NGOs) and People's Organizations (POs)**, who provide on-site extension and project support to the VWMC and IVWMC in each valley.

1.2.2 Supervisory and Control Structures

The project is overseen by two structures:

- **National Monitoring Committee (Committee Nationale de Suivi -- CNS)**. The CNS meets two times a year. The members of this Committee are:

- A representative from the Ministry of Agriculture
 - A representative from the Ministry of Hydraulics
 - A representative from the Ministry of Finance
 - A representative from USAID/Senegal
 - Other representatives from the above ministries
- **Technical Monitoring Committee (*Comite Technique de Suivi – CTS*)**. This committee meets once a month, and consists of:
- The Project Director
 - The Inspectors of Agriculture from the two project regions
 - The Chief of Hydraulics from the two project regions
 - The Contractor Chief of Party

1.3 Contractor Statement of Work

The Louis Berger International, Inc. contract was signed on June 15, 1990. The team mobilized in August 1991, with the arrival of the Chief of Party. The Contractor Statement of Work called for the provision of Technical Assistance and related activities for the following components:

- **Water Control and Management.** This involves the planning and implementation of the valley-based water management plans. In this component, the contractor is expected to:
 - Provide long-term technical assistance to the PMU in the planning and implementation of the water management plans.
 - Subcontract with local private sector firms and individuals retained for the construction of the water management structures, in collaboration with the participation of the valley water management committees.
 - Plan and procure commodities in support of the construction and other activities.
- **Institutional Strengthening.** This involves strengthening of local institutions to carry out project related activities during and beyond the life of the project, through the development of a Project Training Program. Three levels of institutions are noted:
 - Government of Senegal Technical Ministries
 - Village Groups
 - Private Sector
- **Operational and Applied Research.** This involves a study of the effects of a major anti-salt structure in the region: the Affiniam Dam, as well as carrying out applied research on the processes of water management, soil reclamation and improved agronomic practices.

- **Environmental, Natural Resource Management and Project Monitoring.** This involves the determination and monitoring of potential environmental consequences of water management structures, as well as carrying out monitoring and evaluation of the program's impact.

1.4 Contractor Organization

Louis Berger International, Inc. is the prime contractor for the implementation of this contract. It has two U.S.-based subcontractors:

- **Louisiana State University Agricultural Center (LSU)**, who provides two of the long term technical assistance team members, as well as the overall management of the Training Program.
- **Tech International, Inc.** who provided technical assistance in support of the in-country training activities.

In addition to the above, LBII engaged and trained local subcontractors, research organizations and NGOs in the various planning, implementation and monitoring activities.

2. ANNUAL WORK PLANS AND TARGETS

While the original Statement of Work specified targets to the year 1999, the LBII contract lasted only to June 1995.¹ Thus, an effort was made to revise the targets expected during the life of the contract. Four annual programs were identified, which corresponded to four groups of valleys in which selection, planning and construction activities took place. The original targets identified are shown in **Figure 2.1**. These were revised annually to reflect actual accomplishments and constraints encountered during implementation.²

Figure 2.2 presents the actual overall results achieved for each of the four programs, while **Figure 2.3** presents the locations of the developed valleys.

¹ The contract was extended to January 31, 1996, in order to continue unfinished construction and carry out transition phase for local management.

² As result of a mid-term evaluation in November 1993, the overall project targets were revised from 60 valleys and 15,000 hectares in 1999 to 25 valleys and 12,000 hectares in 1997 (Project Paper Supplement).

FIGURE 2.1
ORIGINAL GLOBAL TARGETS AND ACHIEVEMENTS

| | TARGETS | | | | | ACHIEVED AS OF JUNE 1995 |
|--|---------|-------|-------|-------|---------|-----------------------------|
| | 1992 | 1993 | 1994 | 1995 | 1992-95 | |
| Program | I | II | III | IV | I-IV | I-IV |
| No. Watersheds | 2 | 6 | 8 | 8 | 24 | 22 |
| Est. Total Ha. ¹ | 750 | 3,576 | 3,670 | 3,670 | 11,666 | 10,155 |
| Est. Ha. in Rice ² | 411 | 1,906 | 1,957 | 1,957 | 6,232 | 4,699.5 |
| No. Antisalt Dikes ³ | 3 | 7 | 7 | 7 | 24 | 24 |
| No. Retention Dikes ³ | 6 | 16 | 4 | 4 | 30 | 30 |
| Est. Rice Production (Tons) ³ | 247 | 1,576 | 3,183 | 5,403 | 10,409 | 5,152.0 |

Notes:

(1) The basis for Total Hectares is "Gross Service Area" (as referred to in the Project Paper, Annex G.1.a, page 11), which is the entire rice growing area in the watershed, including non-cultivated and non-cultivable areas. These are also referred to as valleys and do not include the plateau. The areas for Programs I and II are based on the actual estimated areas. The areas for III and IV are based on averages from Programs I and II.

(2) The basis for Hectares in Rice is "Wet Service Area" (also from PP) which is the Gross Surface Area, less the non-cultivated and non-cultivable areas.

(3) Original plans assumed one anti-salt dike and an average of three retention dikes per watershed. However, in programs III and IV, the number of retention dikes per valley were reduced (see Figure 2.2), due to actual topographic and pedological conditions, in order to achieve cost effectiveness.

FIGURE 2.2
SUMMARY OF SZWMP VALLEYS

| PROGRAM/VALLEY | POPULATION | TOTAL HA | EST. HA IN RICE (94/95) | EST. RICE PROD. (94/95) | NO. ANTI-SALT DIKES | NO. RETENTION DIKES | FIRST YEAR OF OPERATIONS(JUNE) |
|----------------------|---------------|----------------|-------------------------|-------------------------|---------------------|---------------------|---------------------------------|
| PROGRAM I | | | | | | | |
| MAYOR | 2.886 | 197 | 267.5 | 256.5 | 1 | 3 | 1992 |
| NGUINDIR | 3.399 | 572 | 174.4 | 120.7 | 2 | 3 | 1992 |
| Subtotal: | 6.285 | 769 | 441.9 | 377.2 | 3 | 6 | |
| PROGRAM II | | | | | | | |
| K. MANGANA | 1.772 | 400 | 104.8 | 98.1 | 1 | 5 | 1993 |
| BADOBAR ** | 10.609 | 1.000 | 770.2 | 912.6 | 1 | 4 | 1995 |
| KOUNOUNDING DIOLE ** | 2.560 | 480 | 175.5 | 120.7 | 1 | 5 | 1993 |
| BALINGOR | 2.476 | 410 | 111.9 | 118.7 | 2 | - | 1994 |
| DJIMANDE | 2.294 | 487 | 177.8 | 131.4 | 1 | 1 | 1994 |
| DIATANG | 1.351 | 170 | 93.9 | 51.6 | 1 | 1 | 1994 |
| Subtotal: | 21.062 | 2.947 | 1.434.1 | 1.433.2 | 7 | 16 | |
| PROGRAM III | | | | | | | |
| BONA | 4.498 | 300 | 125.8 | 207.7 | 1 | - | 1994 |
| TALITO | 622 | 119 | 52.8 | 74.9 | 1 | - | 1994 |
| MADINA FINDIFETO* | - | - | - | - | - | - | - |
| BOUGNADOU | 2.164 | 212 | 233.8 | 285.4 | 1 | 1 | 1994 |
| TONIATABA | 3.244 | 177 | 136.5 | 219.0 | 1 | - | 1994 |
| SEGAFOLA | 2.476 | 1.227 | 389.4 | 490.4 | 1 | 1 | 1994 |
| SILINKINE | 3.768 | 360 | 90.4 | 51.5 | 1 | 1 | 1995 |
| DJINAKI | 1.796 | 550 | 211.0 | 148.4 | 1 | 1 | 1995 |
| Subtotal: | 18.568 | 2.942 | 1.239.7 | 1.477.3 | 7 | 4 | |
| PROGRAM IV | | | | | | | |
| BIRKAMA | 9.396 | 447 | 437.9 | 550.1 | 1 | 1 | 1995 |
| SAMINE ESCALE | 8.732 | 1.260 | 327.9 | 258.0 | 1 | - | 1995 |
| BOUNKILING | 4.021 | 210 | 183.7 | 304.0 | 1 | - | 1995 |
| NDIAMA | 3.732 | 191 | 244.1 | 498.6 | 1 | - | 1995 |
| DIAGNON* | - | - | - | - | - | - | - |
| DIANGO | 878 | 690 | 278.6 | 206.7 | 1 | 1 | 1995 |
| COLOMBA | 1.840 | 244 | 168.1 | 105.9 | 1 | 1 | 1995 |
| DJIMAKAKOR | 2.092 | 498 | 103.7 | 102.8 | 1 | 1 | 1995 |
| BAILA KATIPA* | - | - | - | - | - | - | - |
| DIEGOUNNE* | - | - | - | - | - | - | - |
| Subtotal: | 3.0961 | 3.540 | 1.744 | 2.026.1 | 7 | 4 | |
| GRAND TOTAL | 76.876 | 10, 198 | 4,859.7 | 5,313.8 | 24 | 30 | |

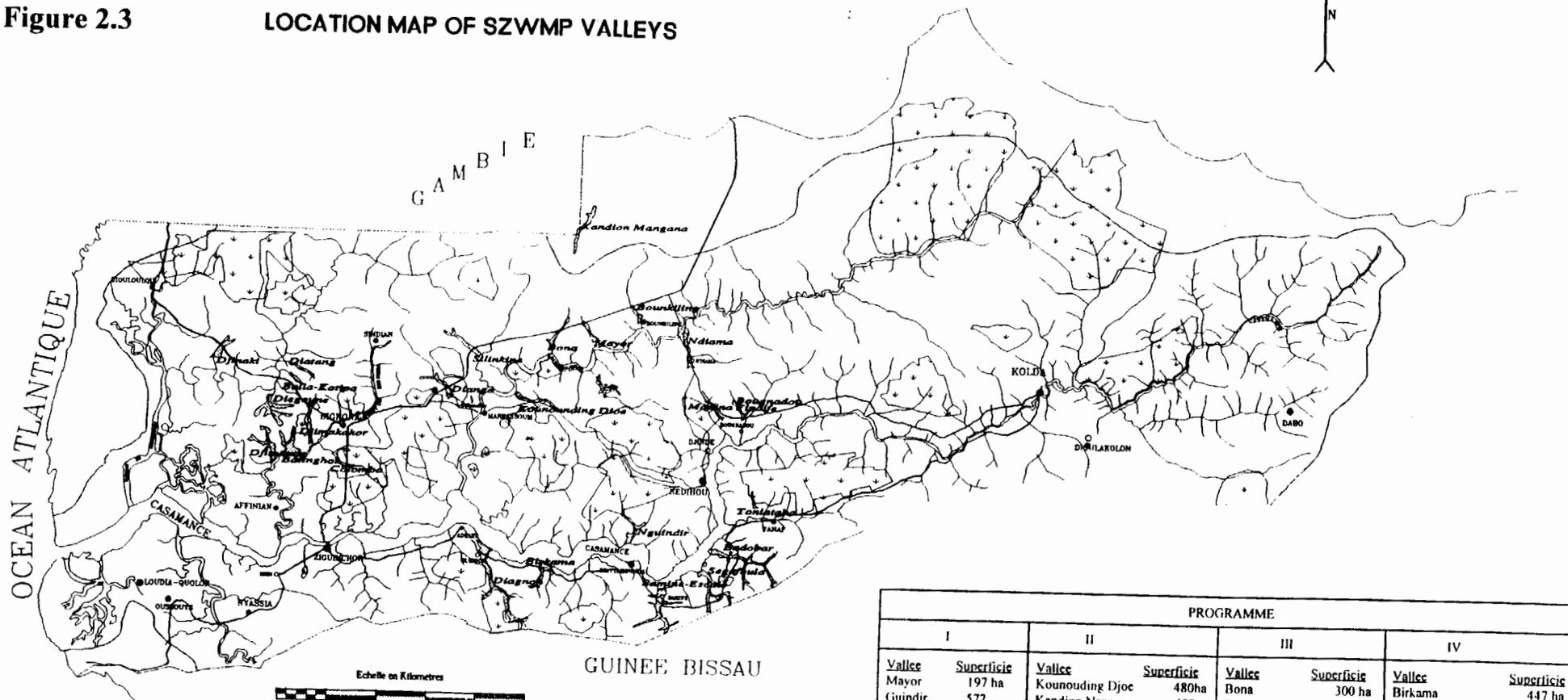
* Removed from the Program. However, detailed designs were completed.

** Only partial water control achieved as of 1995.

PROGES

Figure 2.3

LOCATION MAP OF SZWMP VALLEYS



Legende

| | | | |
|----------------------|--|----------------------------|--|
| Limites de Pays..... | | Cours deau primaire..... | |
| Forets Classees..... | | Cours deau secondaire..... | |
| Routes..... | | Cours deau tertiaire..... | |
| Bas-fonds..... | | Villes, village..... | |

SOURCE: REPERAGE DE BASSIN, CARTE DE LA ZONE DE L'EST A L'EST
 REPERAGE DE BASSIN DE LA ZONE DE L'EST A L'EST
 REPERAGE DE BASSIN DE LA ZONE DE L'EST A L'EST
 REPERAGE DE BASSIN DE LA ZONE DE L'EST A L'EST

Louis Berger International, Inc. June 1995

| PROGRAMME | | | | | | | |
|--------------|------------|-----------------|--------------|-----------|--------------|---------------|--------------|
| I | | II | | III | | IV | |
| Vallee | Superficie | Vallee | Superficie | Vallee | Superficie | Vallee | Superficie |
| Mayor | 197 ha | Kounouding Djoe | 480ha | Bona | 300 ha | Birkama | 447 ha |
| Guindir | 572 | Kandion Nangana | 400 | Bougnadou | 212 | Samine Escalé | 1260 |
| | | Badobar | 1000 | Talito | 119 | Boukiling | 210 |
| | | Balingor | 410 | Toniataba | 174 | Ndiama | 191 |
| | | Djimande | 487 | Segafoula | 1227 | Diagnon | |
| | | Djatang | 170 | Madina | | Diango | 690 |
| | | | | Silinkine | 360 | Colomba | 244 |
| | | | | Djinaki | 550 | Djougounne | |
| | | | | | | Djimakakor | 498 |
| | | | | | | Baila Katipa | |
| TOTAL | 769 | | 2,947 | | 2,942 | | 3,540 |

3. WATER CONTROL AND MANAGEMENT

Over the contract period, the PMU developed and refined a standardized approach and methodology for planning and implementation of watershed management. This has been an iterative process: an initial approach was tested in Program I and refined each ensuing year, culminating in Program IV. Overall, the principal program activities can be divided into the following:

- Valley Selection and Preparation
- Construction
- Demonstration and Applied Research
- Maintenance, Agricultural Extension and Monitoring

The planning and implementation framework for these activities in the last year of operations is shown **Figure 3.1**, which shows that, as construction is completed in each valley, activities shift toward demonstration, applied research, maintenance and monitoring.

3.1 Valley Selection

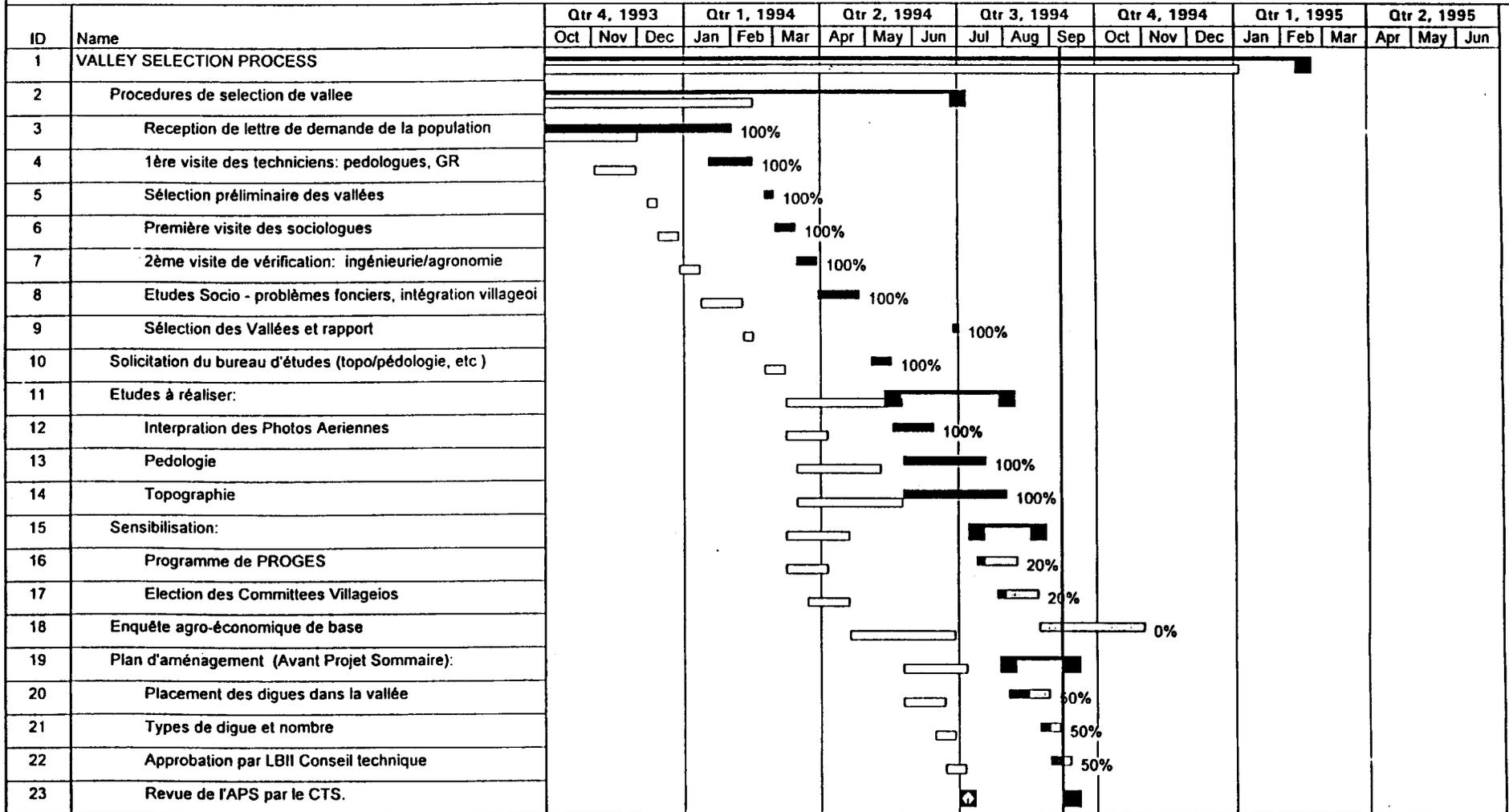
The first two valleys (Program I) were selected as test sites from an initial list of ten valleys in the Project Paper. Selection was made based on engineering, agro/soils and social criteria developed by LBII/PROGES staff and approved by USAID. In subsequent years (Programs II, III and IV), valleys were screened and selected from the original list, plus those requesting assistance from the project.

The selection process involved a series of initial meetings with the populations and numerous engineering, agronomic and social surveys. Valleys were recommended for selection based on a weighted ranking scheme involving three principal disciplines: rural engineering, agro-pedology and sociology. Each disciplinary team established a standardized evaluation form and scoring procedure, which enabled the ranking of each site in relation to the others. The total number of points given to each of the three disciplines reflected the project's overall priorities. In general, the project accorded a relatively higher weight to sociological considerations, seeking sites where the population showed a particular motivation and where there appeared to be limited problems in land tenure, organization, etc. After the selection of Program I, these criteria were refined and applied to subsequent programs. **Figure 3.2** presents the scoring sheets used for each discipline.

FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS

JULY 94 to JUNE 95 PROGRAM STATUS



Project: SZWMP IMPLEMENTATION PLAN
Date: 7/9/94

| | | | | | |
|-------------------|--|----------------------|--|-------------------|--|
| Planned | | Noncritical Progress | | Planned Rolled Up | |
| Critical | | Planned Milestone | | Rolled Up | |
| Critical Progress | | Milestone | | | |
| Noncritical | | Summary | | | |

FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS (Cont.)

JULY 94 to JUNE 95 PROGRAM STATUS

| ID | Name | Qtr 4, 1993 | | | Qtr 1, 1994 | | | Qtr 2, 1994 | | | Qtr 3, 1994 | | | Qtr 4, 1994 | | | Qtr 1, 1995 | | | Qtr 2, 1995 | | | |
|----|---|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|--|
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | |
| 47 | Lancement d'invitation de prequalification | | | | | | | | | | | □ | | □ | 0% | | | | | | | | |
| 48 | Depouillement des dossiers de prequalification | | | | | | | | | | | | □ | | □ | 0% | | | | | | | |
| 49 | Préparation des DAO pour le volet construction | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 50 | Lancement des appels d'offres | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 51 | Soumission des offres | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 52 | Installation des ONG dans les vallée du Prgm IV | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 53 | Dépouillement des offres | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 54 | Attribution des marchés | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 55 | Installation des CIVGE | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |
| 56 | Présentation de l'Entreprise à la population et aux ONG's | | | | | | | | | | | | | | ▬ | ▬ | 0% | | | | | | |

15

| | | | | | | |
|--|-------------------|--|----------------------|---|-------------------|---|
| Project: SZWMP IMPLEMENTATION PLAN Date: 7/9/94 | Planned |  | Noncritical Progress |  | Planned Rolled Up |  |
| | Critical |  | Planned Milestone |  | Rolled Up |  |
| | Critical Progress |  | Milestone |  | | |
| | Noncritical |  | Summary |  | | |

FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS(Cont.)

JULY 94 to JUNE 95 PROGRAM STATUS

| ID | Name | Qtr 1, 1994 | | | Qtr 2, 1994 | | | Qtr 3, 1994 | | | Qtr 4, 1994 | | | Qtr 1, 1995 | | | Qtr 2, 1995 | | | Qtr 3, 1995 | | |
|----|--|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| 57 | CONSTRUCTION PROGRAM | | | | | | | | | | | | | | | | | | | | | |
| 58 | Encadrement de la population par les ONG | 0% | | | | | | | | | | | | | | | | | | | | |
| 59 | Démarrage des travaux de construction | | | | | | | | | | | | | | | | | | | | | |
| 60 | Installation des conducteurs de travaux | 0% | | | | | | | | | | | | | | | | | | | | |
| 61 | Surveillance des travaux par LBII | | | | | | | | | | | | | | | | | | | | | |
| 62 | Formation sur le tas des entreprises | 0% | | | | | | | | | | | | | | | | | | | | |
| 63 | Supervision et contrôle des compacité par le CEEREQ | | | | | | | | | | | | | | | | | | | | | |
| 64 | Organisation des équipes villageoise pour travaux | 0% | | | | | | | | | | | | | | | | | | | | |
| 65 | Contribution des villageois: déblaiement, piquets etc | | | | | | | | | | | | | | | | | | | | | |
| 66 | Négociation pour travaux payés (ONG, CIVGE, Entreprise) | 0% | | | | | | | | | | | | | | | | | | | | |
| 67 | Explication des procédures pour le paiement aux villageois | | | | | | | | | | | | | | | | | | | | | |
| 68 | Contrôle topographique pour volumes réalisés | 0% | | | | | | | | | | | | | | | | | | | | |
| 69 | Décomptes provisoires (paiement partiel des travaux à l'entr | | | | | | | | | | | | | | | | | | | | | |
| 70 | Formation des villageois sur la gestion du fonds de rouleme | 0% | | | | | | | | | | | | | | | | | | | | |
| 71 | Fin de la construction | | | | | | | | | | | | | | | | | | | | | |
| 72 | Réception provisoire et décompte finale | 0% | | | | | | | | | | | | | | | | | | | | |
| 73 | Réception définitive (12 mois après réception provisoire) | | | | | | | | | | | | | | | | | | | | | |

16

Project: SZWMP IMPLEMENTATION PLAN
Date: 7/9/94

| | | | | | |
|-------------------|--|----------------------|--|-------------------|--|
| Planned | | Noncritical Progress | | Planned Rolled Up | |
| Critical | | Planned Milestone | | Rolled Up | |
| Critical Progress | | Milestone | | | |
| Noncritical | | Summary | | | |

FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS (Cont.)

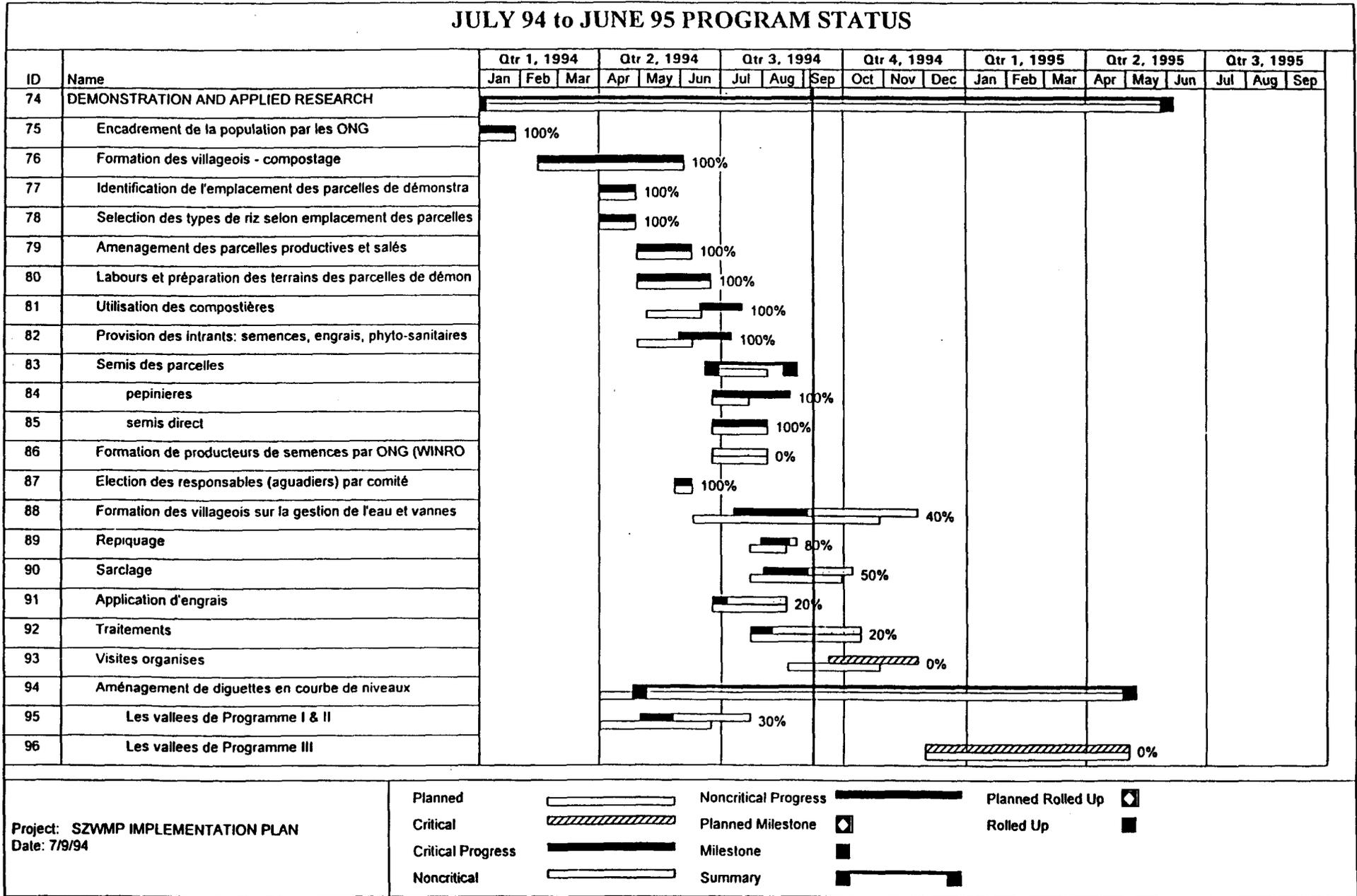


FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS (Cont.)

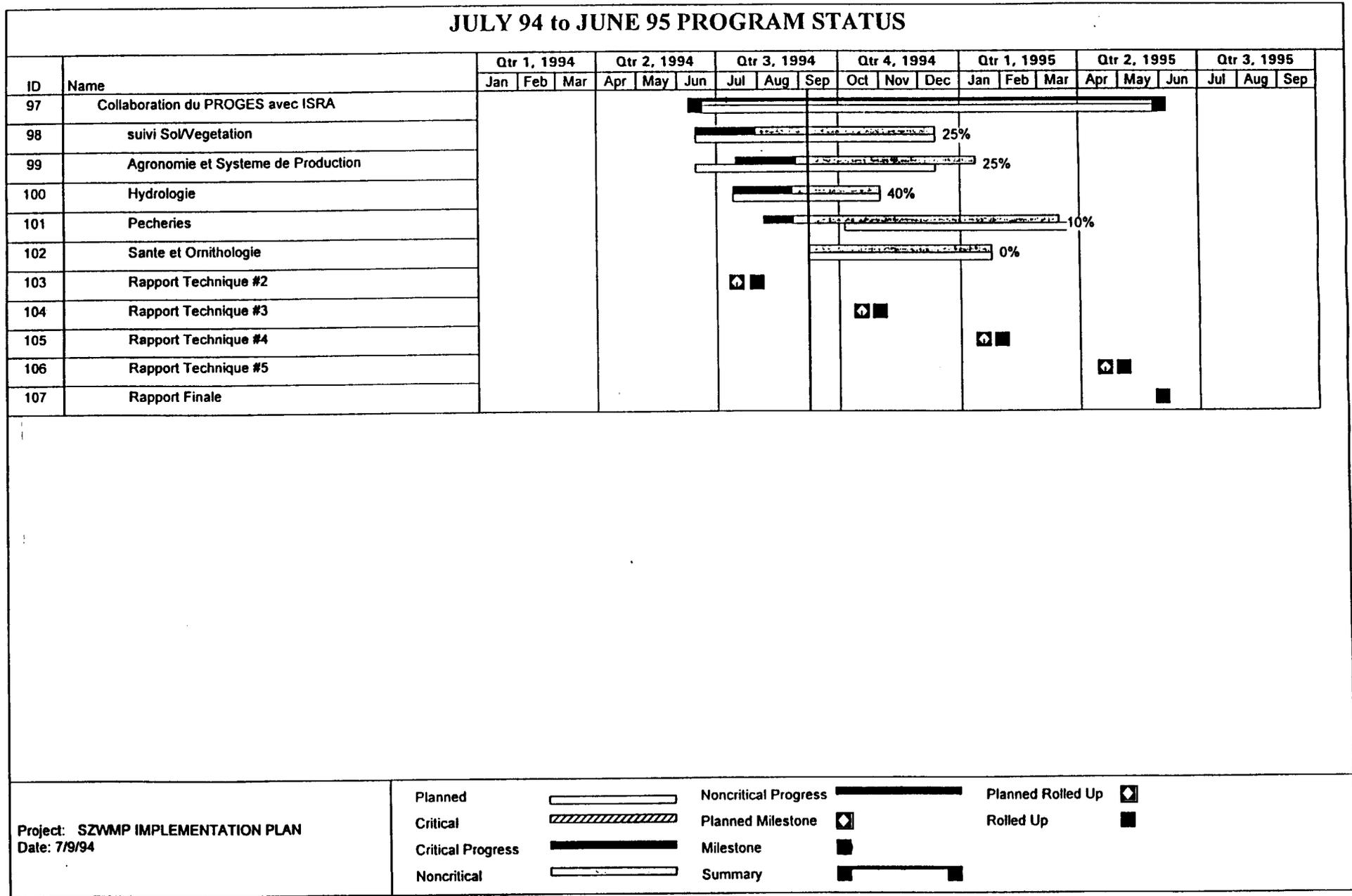
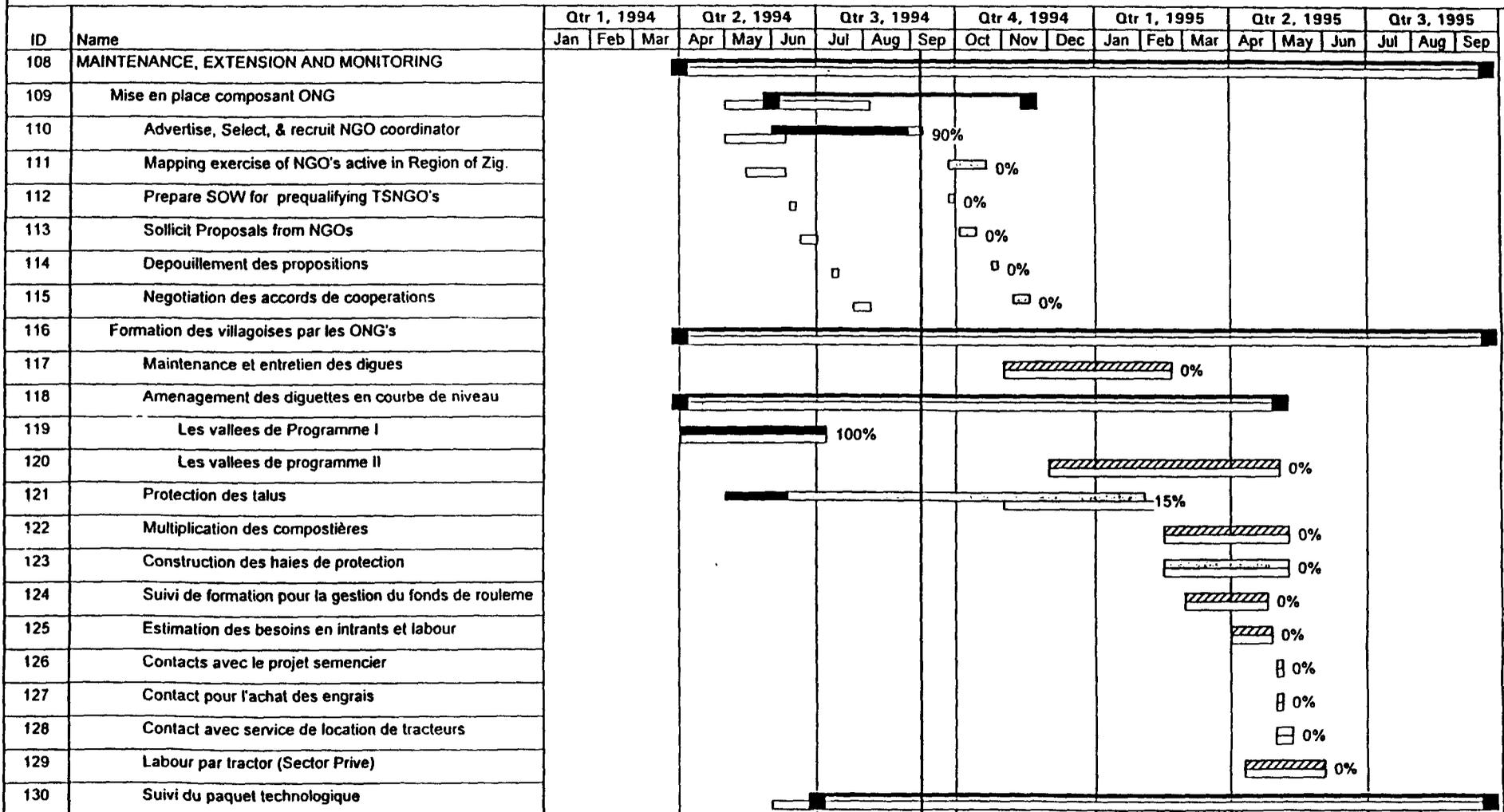


FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS (Cont.)

JULY 94 to JUNE 95 PROGRAM STATUS



19

Project: SZWMP IMPLEMENTATION PLAN
Date: 7/9/94



FIGURE 3.1

SUMMARY OF SZWMP PLANNING AND IMPLEMENTATION PROCESS (Cont.)

JULY 94 to JUNE 95 PROGRAM STATUS

| ID | Name | Qtr 1, 1994 | | | Qtr 2, 1994 | | | Qtr 3, 1994 | | | Qtr 4, 1994 | | | Qtr 1, 1995 | | | Qtr 2, 1995 | | | Qtr 3, 1995 | | |
|-----|--|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| 131 | Campagne 1994 | | | | | | | | | | | | | | | | | | | | | |
| 132 | Campagne 1995 | | | | | | | | | | | | | | | | | | | | | |
| 133 | Enquete de suivi agro-economique | | | | | | | | | | | | | | | | | | | | | |
| 134 | Etude de base, (Echantillon des nouvelles vallees) | | | | | | | | | | | | | | | | | | | | | |
| 135 | Suivi des vallees deja amenees (Echantillon) | | | | | | | | | | | | | | | | | | | | | |
| 136 | Rapport de l'enquete | | | | | | | | | | | | | | | | | | | | | |
| 137 | Suivi legere d'hydrologique et sol (toutes les vallees) | | | | | | | | | | | | | | | | | | | | | |
| 138 | Enquete KAP des parametres de base | | | | | | | | | | | | | | | | | | | | | |
| 139 | Suivi de la gestion des vannes | | | | | | | | | | | | | | | | | | | | | |
| 140 | Enquetes des zones cultives (Inspection regional) | | | | | | | | | | | | | | | | | | | | | |
| 141 | Carrés de rendement | | | | | | | | | | | | | | | | | | | | | |
| 142 | Superficie | | | | | | | | | | | | | | | | | | | | | |
| 143 | Rapport des superficies et de la production | | | | | | | | | | | | | | | | | | | | | |
| 144 | Evaluation de production sur les parcelles de démonstrator | | | | | | | | | | | | | | | | | | | | | |
| 145 | Rapport des parcelles de demonstrations | | | | | | | | | | | | | | | | | | | | | |
| 146 | Enquete de culture de riz en contre-saison | | | | | | | | | | | | | | | | | | | | | |
| 147 | Rapport de riz en Contre saison | | | | | | | | | | | | | | | | | | | | | |

Project: SZWMP IMPLEMENTATION PLAN
Date: 7/9/94

| | | | | | |
|-------------------|--|----------------------|--|-------------------|--|
| Planned | | Noncritical Progress | | Planned Rolled Up | |
| Critical | | Planned Milestone | | Rolled Up | |
| Critical Progress | | Milestone | | | |
| Noncritical | | Summary | | | |

FIGURE 3.2
SITE SELECTION CRITERIA

A. SECTION SOCIOLOGIE

| CRITERE | BAREME |
|--|-----------|
| <p><u>RECEPTIVITE</u> Quel est le degré d'engagement de la population à effectuer des travaux d'investissement humain? - Il y a un haut niveau de réceptivité montré et chaque village a donné une liste des participants. (8) - Chaque village a donné une liste des participants. (5) - La moitié des villages ont donné une liste des participants. (5) - Aucun village n'a donné une liste des participants mais il y a une expression d'intérêt. (1) - Pas d'intérêt. (0)</p> | 8* |
| <p><u>CONFLITS FONCIERS</u> - Chaque village a une connaissance sur les délimitations précises dans la vallée et il y a une structure efficace pour régler des problèmes fonciers. (12) - Il y a un conflit foncier sur une partie de la vallée qui ne pose pas un problème majeur à toute la vallée. (4) - Il y a un conflit grave qui puisse entraver la mise en valeur de la vallée. (0)</p> | 12* |
| <p><u>DISPONIBILITE DE LA MAIN D'OEUVRE</u> Nombre des actifs: 1000 + (8) 750 - 1000 (6) 400 - 750 (4) 250 - 400 (2) - 250 (0)</p> | 8* |
| <p><u>ORGANIZATIONS DANS LA VALLEE</u> La plupart des villages ont-ils des associations villageoises actives? (les notes sont cumulatives) Associations des femmes (3) Associations des jeunes (1) Associations des hommes (1) Associations des producteurs (mixte) (3)</p> | 8 |
| <p><u>ENCADREMENT</u> Quel est le niveau d'encadrement dans la vallée? Encadrement existe et est disponible au PROGES. (4) Encadrement existe mais peu disponible au PROGES. (2) Encadrement n'existe pas. (0)</p> | 4 |
| TOTAL | 30 |

* Rubrique pour lequel la note 0 entraîne l'élimination immédiate de la vallée concernée.

B. SECTION GENIE RURAL

| CRITERE | ECHELLE DE BAREME | BAREME |
|-------------------------------|---|--------|
| <u>CHARACTERISTIQUES TOPO</u> | | |
| Pente: R | R < 0.5% : faible: 2 R > 2.0% très forte: 4 Plat: 1 accidenté: 0 | 6 |
| Perméabilité | | 4 |
| <u>HYDROLOGIE</u> | | |
| H max marée: m | > 1.0 m: 0 < 0.5 m: 2 | 4 |
| Lame d'eau an: mm | < 500 mm: 0 > 600 mm: 2 | 6 |

| | | |
|---|--|-----------|
| SCHEMA D'AMENAGEMENT | | |
| Infrastructures existantes: - ouvrages d'art - digues | | 6 |
| Infrastructures à créer: - ouvrages d'art - digues | | 4 |
| TOTAL | | 30 |

C. SECTION AGRO-PEDOLOGIE

| CRITERE | ECHELLE DE BAREME | BAREME |
|---|-------------------|-----------|
| ETAT DU SOL | | |
| Texture: lourde | 1 | 2 |
| moy | 2 | |
| grossière | 1.5 | |
| PH: acide | 2.5 | 2.5 |
| très acide | 1 | |
| CE: salé | 1.5 | 1.5 |
| très salé | 1 | |
| Niveau nappe phréatique | | 2 |
| < 50 cm | 2 | |
| < .50 cm | 1 | |
| PROPORTION DES SOLS DIFFICILEMENT RECUPERABLES | | |
| > 50% | 1 | |
| 40 à 50% | 2 | |
| 30 à 40% | 3 | 6 |
| 20 à 30% | 4 | |
| 10 à 20% | 5 | |
| < 10% | 6 | |
| QUALITE DES EAUX DE SURFACE | | |
| douce < 10 ms/cm | 4 | |
| 10 à 20 ms/cm | 3 | |
| 20 à 30 ms/cm | 2 | 4 |
| > 30 ms/cm | 1 | |
| PROPORTION DE SURFACE CULTIVEE | | |
| > 60% | 4 | |
| 40 à 60% | 3 | 4 |
| 25 à 40% | 2 | |
| < 25% | 1 | |
| TECHNIQUE DE PREPARATION DU SOL | | |
| Labour à plat | 2 | |
| Labour en billons | 4 | 4 |
| Labour en microbassins | 3 | |
| MODE D'EXPLOITATION RIZICOLE | | |
| Semis direct | 1 | |
| Repiquage | 3 | 4 |
| Utilisation amendements | 1 | |
| TOTAL | | 30 |

The following summarizes the preliminary studies carried out in the selection phase.

-Sociology

An initial questionnaire was developed by the PMU Sociologist and the RWMT Extension Specialists to gather baseline information on the sociological selection criteria. The questions were designed to ascertain on how the villagers could be organized (communal experiences with neighboring villages, existence of associations, etc.); potential land tenure conflicts (existence and competence of village structures to manage land tenure issues, clearly established boundaries within the rice fields); and the availability of manual labor (lists of villagers, demographic data).

-Rural Engineering

The engineering section reviewed and updated existing documentation and data on hydrology, topography and soils for the sites under consideration. This information enabled preliminary calculation of design floods; calculation of the area of the watershed; estimation of the areas under rice and areas to reclaim; topographic characteristics; access; and other site development considerations. Based on these parameters, the team established preliminary development schemes, which included the initial placement and sizing of the dikes.

Figure 3.3 shows a typical valley development scheme.

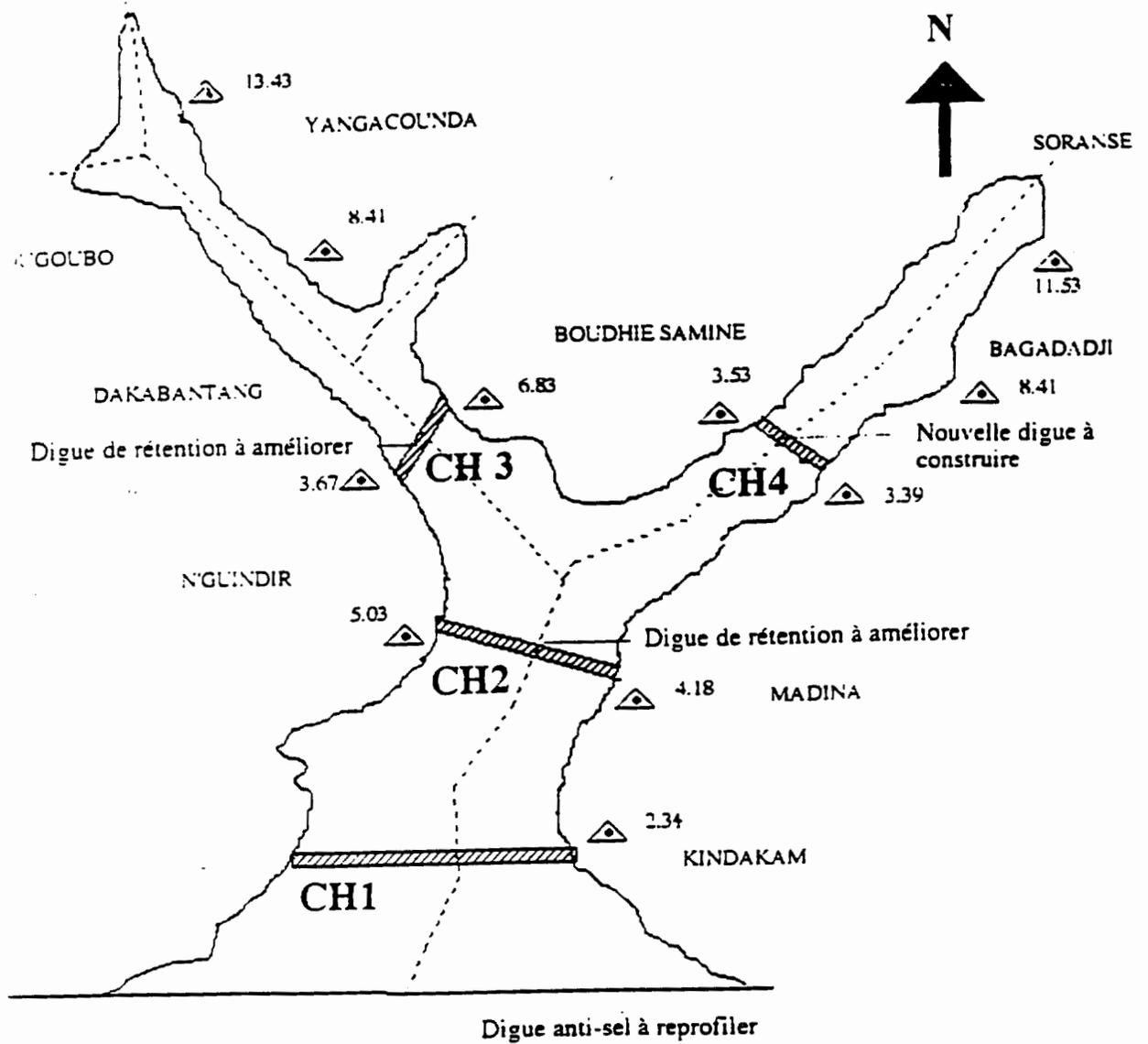
-Agro-Pedology

Existing soils and agronomic information were supplemented by field reconnaissance and *in situ* measurements in the valleys under consideration. These were two-fold:

Agronomy: Field observations and discussion with farmers to update and confirm the agronomic practices, production systems, constraints and yields expressed in previous reports.

Soils: Rates of salinity and acidity were measured with ph meters and electrical conductivity meters. With the aid of square shovels, augers and pedologic profile pits, soil types and levels of evolution were distinguished, and the depth of the water table was measured. These led to the classification of the soils into current and potential aptitude for rice production, which provided a measure of the amount of land recuperable under the project. **Figure 3.4** presents an example of the classification of soils and the assessment of potential for rice production for one valley, as well as a summary for all valleys.

FIGURE 3.3
 SAMPLE DEVELOPMENT PLAN - N'GUINDIR VALLEY



Fleuve Casamance

Ech : 1 / 50.000

| | |
|-----------------------------|---------------------|
| Surface du bassin versant : | 104 km ² |
| Surface de la vallée : | 316 ha |

PLAN D'AMENAGEMENT DE LA VALLEE DE N'GUINDIR

FIGURE 3.4
SAMPLE CLASSIFICATION AND APTITUDE OF SOILS (BIRKAMA VALLEY)

A. SOLS EN PRESENCE DANS LA VALLEE

| UNITES PAYSAGIQUES | UNITES DE SOLS | SYMBOLE | SUPERFICIES (HA) |
|--|--|---------|------------------|
| Lit mineur inondé | Sols potentiellement sulfatés acides | US1 | 14 |
| Lit majeur inondable | Sols potentiellement sulfatés acides acidifiés | US2 | 6 |
| Terrasse inférieure à tanne nu | Sols sulfatés acides argileux à jarosite de faible profondeur | US4 | 56 |
| Terrasse inférieure à tanne herbacé | Sols sulfatés acides argileux à jarosite de moyenne profondeur | US5 | 84 |
| | Sols sulfato acides matures argilo-sableux | US6 | 126 |
| Bas fond inondable (Terrasse inférieure) | Sols hydromorphes minéraux argileux à gley | US7a | 20 |
| | Sols hydromorphes minéraux argileux à pseudogley | US7b | 8 |
| | Sols hydromorphes minéraux argilo-sableux à pseudogley | US8 | 68 |
| Terrasse haute à savane arborée dense | Sols peu évolués sablo-argileux ferrugineux | US10 | 55 |
| TOTAL | | | 437 |

B. RESUME DES APTITUDES DE SOLS (HA)

| Types de sols | Aptitude actuelle | | | | Aptitude potentielle | | |
|---------------|-------------------|-----------|---------|-----------|----------------------|---------|-----------|
| | Inapte | Marginale | Moyenne | Très apte | Marginale | Moyenne | Très apte |
| US1 | 14 | - | - | - | 14 | - | - |
| US2 | 6 | - | - | - | 6 | - | - |
| US4 | 56 | - | - | - | 56 | - | - |
| US5 | - | 84 | - | - | - | 84 | - |
| US6 | - | 126 | - | - | - | 126 | - |
| US7a | - | - | - | 20 | - | - | 20 |
| US7b | - | - | - | 8 | - | - | 8 |
| US8 | - | - | 68 | - | - | - | 68 |
| US10 | - | 55 | - | - | - | 55 | - |
| TOTAL | 76 | 265 | 68 | 28 | 76 | 265 | 96 |

FIGURE 3-4a

**Caractéristiques / Aptitudes / Superficies (Ha) des différentes unités pédologiques
en amont des digues anti-sel des vallées Gestions 1992 et 1993**

| Unités de sols | Limitations majeures | Aptitudes | | Nguiroir | Mayor | Bacobar | K. Mangana | K. Dies |
|--|---|------------------------|--------------------|----------|-------|---------|------------|---------|
| | | Actuelle | Potentielle | | | | | |
| - Sols potentiellement sulfatés acides - Sols potentiellement sulfatés acides acidifiés | - Faible portance - Salinité, Acidité potentielle ou faible - Couvert arbustif (mangrove) | Inapte (NR1) | Marginale | 22 | 0 | - | - | - |
| Sols sulfatés acides jeunes à jarosite superficielle ou à moyenne profondeur (30 à 50cm) | - Salinité forte, acidité forte - Drainage pauvre - Structure dégradée | Inapte (SR3) | Inapte à marginale | 210 | 0 | - | - | - |
| - Sols sulfatés acides maturés - Sols hydromorphes à gley salé | Remontée capillaire des eaux de nappe salée et acide | Marginale (SR1) | Moyenne | 146 | 33 | - | - | - |
| Sols hydromorphes minéraux à gley ou à pseudogley | Travail difficile sur sol de texture argileuse | Moyenne à élevée (SR2) | élevée | 194 | 148 | - | - | - |
| - Sols hydromorphes minéraux sableux - Sols peu évolués ferrugineux | - Déficit hydrique - Erosion hydrique - Fertilité faible - Couvert végétatif important | Marginale (SR3) | Moyenne | 0 | 9 | - | - | - |
| TOTAL ETUDE (1) | | | | 340 | 181 | - | - | - |
| SUPERFICIE AMONT ANTI-SEL (2) | | | | 572 | 197 | 1000 | 400 | 480 |

Sources: Etude pédologique PROGES / SENAGROSOL, 1992

FIGURE 3-4 b

Caractéristiques / Aptitudes / Superficies (Ha) des différentes unités pédologiques
en amont des digues anti-sel des vallées Gestion 1994

| Unités de sols | Limitations majeures | Aptitudes | | Balingore | Djimande | Diatang | Bona | Bougnadou | Talito | Toniataba | Ségafoula |
|--|---|---|--------------------|--------------|--------------|------------|--------------|--------------|------------|--------------|-------------|
| | | Actuelle | Potentielle | | | | | | | | |
| - Sols potentiellement sulfatés acides - Sols potentiellement sulfatés acides acidifiés | - Faible portance - Salinité, Acidité potentielle ou faible - Couvert arbustif (mangrove) | Inapte A ₁ / 1 ₁ , 2 ₁ / 3 | Marginale | 5.2 | 0 | 18.2 | 25.3 | 8.3 | 15 | 0.8 | 75 |
| Sols sulfatés acides jeunes à jarosite superficielle ou à moyenne profondeur (30 à 50cm) | - Salinité forte, acidité forte - Drainage pauvre - Structure dégradée | Inapte S ₁ / 3 ₁ , 4 ₁ / 8 | Inapte à marginale | 52,5 | 33 | 5 | 128,4 | 52,5 | 36.8 | 36,1 | 210 |
| - Sols sulfatés acides maturés - Sols hydromorphes à gley salé | Remontée capillaire des eaux de nappe salée et acide | Marginale Mi / 5 , 6 / 4 , 5 , 13 | Moyenne | 89 | 7 | 39,2 | 30,6 | 19,5 | 10.6 | 0 | 70 |
| Sols hydromorphes minéraux à gley ou à pseudogley | Travail difficile sur sol de texture argileuse | Moyenne à élevée H ₁ / 7 , 8i / 21 | élevée | 154,6 | 108,3 | 4 | 114,9 | 126,7 | 59.6 | 122,3 | 325 |
| - Sols hydromorphes minéraux sableux - Sols peu évolués ferrugineux | - Déficit hydrique - Erosion hydrique - Fertilité faible - Couvert végétatif important | Marginale 9 ₁ , 10 / C ₁ , T ₁ / 18 , 20 , 23 , 24 , 25 | Moyenne | 108,8 | 339,2 | 273,6 | 1,4 | 4,7 | 0 | 0 | 527 |
| TOTAL ETUDE (1) | | | | 410,1 | 487,5 | 340 | 300,6 | 211,7 | 122 | 159,2 | 1207 |

Sources: Etude pédologique PROGES (Consultant TATCH) des vallées de Bona, Bougnadou, Talito, Toniataba, Ségafoula/ 1993 (1, 2, 3, 4, 5, 6, 9, 10)

Etude pédologique sur la vallée de Bignona, Aubrun et al des vallées de Balingore et Djimande / 1986 (A₁ , S₁ , Mi , H₁ , C₁ , T₁)

Etude pédologique du marigot de Baila, LBII de la vallée de Diatang / 1981 (3 , 4 , 5 , 8 , 13 , 18 , 20 , 21 , 23 , 24 , 25)

FIGURE 3-4c

Caractéristiques / Aptitudes / Superficies (Ha) des différentes unités pédologiques
en amont des digues anti-sel des vallées Gestion 1995

| Unités de sols | Limitations majeures | Aptitudes | | Silinkine | Djinaki | Djimakakor | Colomba | Diango | Birkama | S. Escale | Bounkiling | Ndiama |
|--|---|---|--------------------|-----------|---------|------------|---------|--------|---------|-----------|------------|--------|
| | | Actuelle | Potentielle | | | | | | | | | |
| - Sols potentiellement sulfatés acides - Sols potentiellement sulfatés acides acidifiés | - Faible portance - Salinité, Acidité potentielle ou faible - Couvert arbustif (mangrove) | Inapte US ₁ , US ₁ / 1 ₁ | Marginale | 15 | 22 | 13 | 0 | 7 | 20 | 131 | 8 | 21 |
| Sols sulfatés acides jeunes à jarosite superficielle ou à moyenne profondeur (30 à 50cm) | - Salinité forte, acidité forte - Drainage pauvre - Structure dégradée | Inapte US ₂ / 2, 3 ₁ | Inapte à marginale | 25 | 52 | 131 | 2 | 74,5 | 140 | 244 | 49 | 34 |
| - Sols sulfatés acides maturés - Sols hydromorphes à gley salé | Remontée capillaire des eaux de nappe salée et acide | Marginale US ₃ , US ₃ / 5 | Moyenne | 35 | 44 | 19 | 17 | 48,5 | 126 | 437 | 27 | 30 |
| Sols hydromorphes minéraux à gley ou à pseudogley | Travail difficile sur sol de texture argileuse | Moyenne à élevée US ₄ / 7 ₁ , 8 ₁ | élevée | 172 | 244 | 148 | 176 | 164,5 | 96 | 117 | 63 | 100 |
| - Sols hydromorphes minéraux sableux - Sols peu évolués ferrugineux | - Déficit hydrique - Erosion hydrique - Fertilité faible - Couvert végétatif important | Marginale US ₅ , US ₅ / 9 ₁ , 10 ₁ | Moyenne | 112 | 190 | 241 | 254 | 610 | 55 | 290 | 54 | 38 |
| TOTAL ETUDE (1) | | | | 359 | 552 | 552 | 449 | 905 | 437 | 1202 | 201 | 223 |

Sources: Etude pédologique PROGES / SENAGROSOL dans les vallées de Silinkine, Djinaki, Colomba, Diango, Birkama, Samine Escale, Bounkiling, Ndiama / 1994 (US₁, US₁, US₁, US₁, US₂, US₂, US₂, US₂)

Etude pédologique PROGES / BPS dans la vallée de Djimakakor (plus Diagon, Baila et Diégonne) / 1994 (1₁, 2₁, 3₁, 5₁, 7₁, 8₁, 9₁, 10₁)

3.2 Valley Preparation

3.2.1 Awareness Campaign

Once a valley was selected, SZWMP staff held awareness meetings (*sensibilisation*), which lead to the election of the VWMC and IVWMC. Generally, the inter-village committees consisted of two members from each village water management committee. The IVWMC were established as an official structure in the presence of the local authorities, including the Sous-Prefet and the Chef du CER.

The awareness campaigns revolved around three major themes:

- Long Term Benefits of the Program
- Operations and Maintenance of the Dikes
- Establishment of Revolving Fund to finance production, operations and maintenance activities

Emphasis was placed on the valley as one unit requiring the cooperation of all concerned villages, and efforts are made to include women in the sessions to have their active input.

Following the first year, the project organized inter-valley visits. This enabled the farmers with previous project experience to share their knowledge and experiences with farmers from valleys currently being planned. Sixty visits have been carried out, involving 1,200 visiting participants. These are shown in **Figure 4.7** in the next chapter.

3.2.2 Walkthrough

In order to involve the villagers in the design of the watershed development plan, each valley carried out a "Walkthrough." This took the form of a meeting between the SZWMP staff and the valley responsible people -- IVWMC, village chiefs, religious leaders and local authorities. The Preliminary Design (see below) for the development of the valley was discussed by walking through the valley, indicating the placement and the number of dikes, the type of infrastructures and other possible water management structures envisaged. The ensuing discussions with the population resulted in a recommended plan. At the "Walkthrough" the valley population gave its approval to the access tracks and borrow pits to be used by contractors during construction.

3.3 Infrastructure Development (Construction)

3.3.1 Preliminary and Detailed Design Studies

Preliminary Design Studies (*Avant Project Sommaire -- APS*)

Based on topographic and soils surveys, and village feedback, the optimum location (or site) of anti-salt and water retention dikes was determined. Land proposed for construction was tested to determine the foundation geotechnical characteristics. Similarly, borrow pits and non-saline water supply were located, within an acceptable radius of the site. The project attempted to avoid building dikes where road access was required, in order to reduce construction costs. The physical dimensions and number of dikes constructed in each valley were a direct function of the results of the topographic and soils studies conducted in the valleys.

Each *APS* document contained the following information:

- Summary of hydrologic, topographic and soils information
- Alternative development schemes for the valley (*variantes*)
- Recommended development scheme for the valley
- Estimated costs for the recommended scheme

Following a home office review, the recommended development plan for each valley was presented for approval by the *Committee Technique de Suivi (CTS)*. Adoption of the plan by the *CTS* then authorized the SZWMP to proceed with Detailed Design Studies.

Detailed Design Studies (*Avant Project Detaillee -- APD*)

The detailed design studies involved primarily topographic and geotechnical studies to develop engineering drawings, construction specifications and quantity estimates for the earthworks and concrete structures.

Engineering drawings for concrete structures were produced on AUTOCAD 12 software, which permits rapid and simple adaptation of the standardized design to dimensions specific to each situation. Standardized plans adaptable to any site, given specific topographic and hydraulic conditions, were developed by the LBII Structural Engineering Division in East Orange, New Jersey, USA. Similarly, earthwork calculations were automated from topographic data using AUTOCAD 12 to provide longitudinal and lateral profiles of the dikes.

Models were established using spreadsheets to determine volumes of all materials needed for construction. For volumetric determinations of concrete structures, input for five variables is fed into the spreadsheet; for volumetric determinations of dike volumes, input is derived from topographic data defining the profile of the dike axis.

Each *APD* document contained the following information:

- Overview of the selected development scheme
- Results of topographic and geotechnical investigations
- Hydrological analysis and dimensioning of the dikes
- Volumetric calculations for the earthworks and concrete structures
- Plan location of borrow pits and fresh water sources
- Cost estimate of the works (privy only to the project staff)
- Assessment of environmental impact

In addition, the *APD* summarized demographic characteristics and the areas flooded by the works, as well as the areas influenced through the water table, thus providing areas directly benefitted by the dikes (or wet surface area).

3.3.2 Dike Construction

Contracting Procedures

Prequalification: Procedures were developed to prequalify contractors to carry out the dike construction program. Each year, a new invitation was made to firms registered in the Casamance to submit prequalification proposals. A standard and simple form was developed that required firms to demonstrate that they are legal entities, are locally registered and have the experience, equipment and financial resources to undertake the work. Firms were allowed 21 days to respond to the nationally announced invitation.

Tendering: Over the project period, the content, organization and format of the tender documents were substantially simplified, reduced in volume and rendered easy to understand by local contractors. The tender documents issued to all prequalified contractors consisted of:

- A *Dossier Technique d'Aménagement*, which specifies:
 - the work to be performed in the valley
 - the principal dimensions of each dike and concrete structure
 - the anticipated construction duration
 - a set of engineering plans and re-bar listings for each dike and structure
- A *Soumission*, providing:
 - Guidelines for submitting the tender
 - A set of forms to complete as submission of tender
- A Financial Proposal, in a preformatted sheet for the earthworks and concrete structure of each dike defining unit prices and unit price breakdowns.

Invitations to tender were issued to all prequalified firms. Site visits were organized within one week of invitation, to show the placement of dikes, location of borrow pits, fresh water supply, access routes, etc. Tenderers were given 21 days to submit their offers in sealed envelopes containing the *Soumission* and Financial Proposal.

In addition to the construction contracts, various support services were subcontracted, including cartography, land surveying, geotechnical quality control by CEREEQ, personal service contracts and computer support. A complete list of subcontracts is provided in Section 7.

Construction

Supervision of Construction

Construction was supervised under the direction of the Genie Rurale Section of the PMU. Local field work site supervisors were hired and trained to carry out day-to-day construction supervision and approval of the works. Geotechnical tests were provided through a subcontract with CEREEQ. In addition, village participation was implemented through the IVWMCs, with assistance of the NGOs.

Figure 3.5 summarizes the status of construction contracts by valley and worksite. In all, the project implemented 59 contracts with 13 contractors. This resulted in the construction of 54 dikes, of which 24 were anti-salt and 30 were water retention dikes, and representing a length of 26,043 meters. Two anti-salt dikes were not totally completed, in the valleys of Badobar and Kounounding Dioe, leaving those valleys with partial water control. The SZWMP PMU will complete those two structures in 1996.

Village Participation in Construction

The Project Paper and LBII contract specified that the placing and compaction of material for the earthworks would be carried out *gratis* by the villagers, in coordination with contractors, who would be responsible for the technical standards of the dikes. In the implementation of Program I, this formula was found to be impractical, due primarily to: (i) the magnitude of the earthwork requirements; (ii) the difficulty in ensuring appropriate compaction standards utilizing hand labor; and (iii) the resistance of the villagers to this approach and their ability to mobilize and contribute the required labor manpower.

Based on this experience, it was determined that earthworks would be carried out mechanically by the contractors, while certain tasks, such as gathering and placing of riprap, would be reserved for the villagers. Villagers were paid an indemnity for their work on the dikes (see Section on Institution-building). These payments provided the basis for establishing a revolving fund to be used for the operation of the dikes. The payment scheme was carried out in close coordination with the IVWMC, who deals directly with the contractor for supplying unskilled labor. A record sheet of all paid and unpaid work by villagers is maintained by the NGOs and the village committees. Each

Figure 3.5

Construction Contract Status

Program I

| Vallées | Chantier (CH) | Longueur digue (m) | Travaux Terrassement niveau exécution (%) | Travaux Génie civil | | Entreprise ou GIE adjudicataire Travaux de terrassement | | Entreprise ou GIE adjudicataire Travaux génie civil | |
|----------|-----------------|--------------------|---|-----------------------|----------------------|---|-----------|---|-----------|
| | | | | Nombre ouvrages en BA | Niveau exécution (%) | Sous-traitant initial | Repreneur | Sous-traitant initial | Repreneur |
| MAYOR | CH1 (DA) | 179 | 100 | 1 | 100 | EBTP | - | EBTP | - |
| | CH2 (DA) | 440 | 100 | 1 | 100 | EBTP | - | EBTP | - |
| | CH3 (DR) | 584 | 100 | 1 | 100 | EBTP | - | EBTP | - |
| | CH4 (DR) | 400 | 100 | 1 | 100 | EBTP | - | EBTP | - |
| | CH5 (diguettes) | - | 100 | - | - | Pop/PROGES | - | Pop/PROGES | - |
| NGUINDIR | CH1 (DA) | 1.330 | 100 | 2 | 100 | DAGHER | - | DAGHER | - |
| | CH2 (DR) | 1.020 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| | CH3 (DR) | 590 | 100 | 1 | 100 | CTS | DAGHER | CTS | - |
| | CH4 (DR) | 425 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| TOTAL | 3 DA | | | | | | | | |
| | 5 DR | 4.968 | - | 9 | - | - | - | - | - |

NB: DA = Digue anti-sel DR = Digue de Rétenion

Figure 3.5 continued

PROGRAM II

| Vallées | Chantier (CH) | Longueur digue (m) | Travaux Terrassement niveau exécution (%) | Travaux Génie civil | | Entreprise ou GIE adjudicataire Travaux de terrassement | | Entreprise ou GIE adjudicataire Travaux génie civil | |
|------------------|-----------------------|--------------------|---|-----------------------|----------------------|---|-----------|---|-------------|
| | | | | Nombre ouvrages en BA | Niveau exécution (%) | Sous-traitant initial | Repreneur | Sous-traitant initial | Repreneur |
| K.DIOE | CH1 (DA) | 1.158,3 | 100 | 1 | 0 | FULADU | - | FULADU | * |
| | CH2 (DR) | 576,5 | 100 | 1 | 100 | DINI/SETRAP | - | DINI/SETRAP | - |
| | CH3 (DR) | 291 | 100 | 1 | 100 | DINI/SETRAP | - | DINI/SETRAP | - |
| | CH4 (DR) | 122 | 100 | 1 | 100 | CET | EBTP | CET | EBTP |
| | CH5 (DR) | PP' | - | - | 1 | 100 | - | - | DINI/SETRAP |
| K.MANGANA | CH1 (DA) | 295 | 100 | 1 | 100 | BAGHER NCO | DAGHER | BAGHER | - |
| | CH2 (DR) | 350 | 100 | 1 | 100 | BAGHER NCO | DAGHER | BAGHER | DAGHER |
| | CH3 (DR) | 260 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| | CH4 (DR) | 220 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| | CH5 (DR) | 160 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| | CH6 (DR) | 160 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| BADOBAR | CH1 (DA) | 900 | 100 | 2 | 90 | GTA | - | GTA | DAGHER |
| | CH2 (DR) | 400 | 100 | 1 | 100 | GTA | DAGHER | GTA | DAGHER |
| | CH3 (DR) | 320 | 100 | 2 | 100 | GTA | - | GTA | EBTP |
| | CH4 (DR) | 240 | 100 | 2 | 90 | EBTP | - | EBTP | - |
| | CH5 (DR) ² | 173 | - | 1 | 100 | GTA | - | GTA | DAGHER |
| DIATANG | CH1 (DA) | 459 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| | CH2 (DR) | 429 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| DJIMANDE | CH1 (DA) | 598 | 100 | 1 | 100 | AREZKI | - | EBTP | - |
| | CH2 (DR) | 240 | 100 | 1 | 100 | AREZKI | - | EBTP | - |
| BALINGHOR | CH1 (DA) | 967 | 100 | 1 | 100 | AREZKI | - | EBTP | - |
| | CH2 (DR) | 674,1 | 100 | 1 | 100 | AREZKI | - | EBTP | - |
| TOTAL | 6 DA 14 DR | 8.992,9 | | 25 | | | | | |

* : To be determined

Figure 3.5 continued

PROGRAM III

| Vallées | Chantier (CH) | Longueur digue (m) | Travaux Terrassement niveau exécution (%) | Travaux Génie civil | | Entreprise ou GIE adjudicataire Travaux de terrassement | | Entreprise ou GIE adjudicataire Travaux génie civil | |
|------------------|---------------|--------------------|---|-----------------------|----------------------|---|-----------|---|-----------|
| | | | | Nombre ouvrages en BA | Niveau exécution (%) | Sous-traitant initial | Repreneur | Sous-traitant initial | Repreneur |
| BONA | CH1 (DA) | 991,60 | 100 | 1 | 100 | AREZKI | - | AREZKI | - |
| BOUGNADOU | CH1 (DA) | 151,55 | 100 | 1 | 100 | ERECO-GRECONS | - | ERECO-GRECONS | EBIS |
| | CH2 (DR) | 285 | 100 | 1 | 100 | ERECO-GRECONS | - | ERECO-GRECONS | EBIS |
| SEGAFOULA | CH1 (DA) | 833 | 100 | 1 | 100 | AREZKI | - | AREZKI | - |
| TALITO | CH1 (DA) | 557 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| TONIATABA | CH1 (DA) | 406 | 100 | 1 | 100 | DAGHER | - | EBIS | - |
| SILINKINE | CH1 (DA) | 833 | 100 | 2 | 100 | DAGHER | - | DAGHER | - |
| | CH2 (DR) | RN4 | - | 1 | 100 | - | - | EBTP | - |
| DJINAKI | CH1 (DA) | 785 | 100 | 1 | 100 | FRANZETTI | - | FRANZETTI | - |
| | CH2 (DR) | RN5 | - | 1 | 100 | FRANZETTI | - | FRANZETTI | - |
| TOTAL | 7 DA | | | | | | | | |
| | 1 DR | 4.842,15 | | 11 | | | | | |

Figure 3.5 continued
PROGRAM IV

| Vallées | Chantier (CH) | Longueur digue (m) | Travaux Terrassement niveau exécution (%) | Travaux Génie civil | | Entreprise ou GIE Adjudicataire Travaux de terrassement | | Entreprise ou GIE adjudicataire Travaux génie civil | |
|----------------------|---------------|--------------------|---|-----------------------|----------------------|---|-----------|---|-----------|
| | | | | Nombre ouvrages en BA | Niveau exécution (%) | Sous-traitant initial | Repreneur | Sous-traitant initial | Repreneur |
| BIRKAMA | CH1 (DA) | 1. 780 | 100 | 1 | 100 | DAGHER | - | DAGHER | - |
| SAMINE ESCALE | CH1(DA) | 1.396 | 100 | 2 | 100 | DAGHER | - | DAGHER | |
| NDIAMA | CH1 (DA) | 490 | 100 | 2 | 100 | EGMBTV | - | EGMBTV | - |
| BOUNKILING | CH1 (DA) | 683 | 100 | 2 | 0 | AREZKI | - | AREZKI | * |
| DIANGO | (CH1 (DA) | 493 | 100 | 1 | 0 | AREZKI | - | AREZKI | * |
| COLOMBA | CH1 (DA) | 568 | 100 | 1 | 100 | KHAYAT | - | KHAYAT | - |
| | CH2 (DR) | 433 | 100 | 1 | 100 | KHAYAT | - | KHAYAT | - |
| DJIMAKAKOR | CH1 (DA) | 880 | 100 | 1 | 100 | FRANZETTI | - | FRANZETTI | - |
| | CH2 (DR) | 518 | 100 | 1 | 100 | FRANZETTI | - | FRANZETTI | - |
| TOTAL | 7 DA 2 DR | 7.241 | - | 12 | | | | | |

* : To be determined

record sheet is signed by the President of the IVWMC, the contractor and witnessed by the worksite supervisor. A pre-determined percentage is kept in the revolving fund and the remainder is paid to each villager having worked the recorded number of hours.

Following tender evaluation the selected contractor was presented to the population. This took the form of an official meeting at which the tasks and obligations of the VSU, the IVWMC and the contractor are discussed and agreed. **Figure 3.6** summarizes village participation and in construction and related project activities. Labor inputs amount to nearly 20,000 person-days of paid and unpaid labor.

3.3.3 Contour Berm Construction

The Project Paper called for contour berm construction in the upstream areas. While initial valley development plans prescribed very low rise contour berms, the project's and villagers' energies were primarily focused on the construction of the anti-salt dikes and water retention dikes.

Recognizing the importance of contour berms and other soil and water conservation measures as complementary investments, the project engaged a soil and water conservation specialist to prescribe a systematic approach. The mission focused on contour berms as one element in a broad range of vegetative and structural soil and water conservation measures that are cost-effective and appropriate to various soil, cropping and topographic conditions. These include:

- Agronomic controls (provision of mulch, weed control and composting)
- Agroforestry and alley cropping
- Fodder trees
- Permeable micro-dams

During the short term consultancy, a pilot demonstration for improved contour berms was completed in one valley, Djinaki. The steps prescribed and tested involved:

- Calculating design runoff
- Layout and staking contours
- Construction
- Outlet structures
- Vegetative protection

The results of the pilot exercise are presented in **Figure 3.7**.

In addition, the short term specialist outlined an overall soil and water conservation program, which included the above-mentioned other measures for two other valleys, Segafoula and Badobar. **Figure 3.8** provides an overview of a sample multi-measure soil conservation plan to be applied in the valleys.

FIGURE 3.6

VILLAGE PARTICIPATION IN CONSTRUCTION AND RELATED WORKS
(PERSON-DAYS, PROGRAMS I, II AND III)

| Vallée | Prog. | Types de travaux | Bénévolat | Travaux payants | Observations |
|------------------|-------|-------------------------------------|--------------|-----------------|---------------|
| Nguindir | I | Confection des diguettes | 112 | 0 | Juin |
| | | Pose des moellons | 271 | 0 | Juin |
| | | Excavation des moellons | | 47 | 178 500 F CFA |
| Mayor | I | Ramassage/ pose des moellons | 716 | 0 | Mars-juillet |
| | | Confection des diguettes | 1,350 | 0 | Février-mai |
| | | Parcelle test compost | 359 | 0 | Juin |
| Kandion Mangana | II | Extraction/ Pose des moellons | 600 | 0 | Avril-juin |
| | | Parcelles test | 75 | 0 | Juin |
| Badobar | II | Collecte/ Chargement de moellons | 0 | 491 | Juin-juillet |
| | | Pose de moellons | 158 | 0 | Juin |
| Kounounding Dioé | II | Pose des moellons | 45 | 0 | Juin |
| Bona | III | Ramassage/ pose des moellons | 0 | 845 | Juin-juillet |
| | | Parcelles pilotes | 2.000 | 0 | Juin-août |
| Talito | III | Construction | 0 | 2.003 | Mars-juillet |
| | | Parcelles pilotes | 769 | 0 | Juin-juillet |
| Madina Findiféto | III | Construction | 35 | 0 | juin |
| Toniataba | III | Construction | 0 | 360 | Juin |
| | | Parcelles pilotes | 697 | 0 | Juin |
| Ségafoula | III | Ramassage moellons | 0 | 136 | Juillet |
| | | Parcelles pilotes (pm) | 0 | 0 | Juin |
| Bougnadou | III | Construction | 0 | 1,128 | Avril-juillet |
| | | Parcelles pilotes | 1,717 | 0 | Juin-juillet |
| Diatang | III | Construction | 0 | 355 | Février-mai |
| | | Parcelles pilotes | 252 | 0 | Juin |
| Balinghor | III | Construction | 0 | 335 | Mars-juin |
| | | Parcelles pilotes | 407 | 0 | Juin |
| Djimande | III | Construction | 0 | 846 | Mars-juin |
| | | Parcelles pilotes | 419 | 0 | Juin |
| TOTAL | | | 9,982 | 6,546 | 16,528 |

Figure 3.6 continued

VILLAGE PARTICIPATION IN CONSTRUCTION AND RELATED WORKS
(PERSON-DAYS, PROGRAM IV)

| Vallée | Types de travaux | Bénévolat | Travaux payants | Observations |
|----------------------|--|--------------|-----------------|----------------------|
| 1. Colomba | Fourniture de piquets | 49 | 0 | |
| | Remblai et divers | 0 | 34 | |
| | Fouille ouvrage | 0 | 8 | |
| 2. Djimakakor | Voie d'accès | 380 | 0 | |
| | Décapage emprise | 0 | 48 | |
| | Remblai bêche | 0 | 20 | |
| | Pose moellons | 72 | 0 | |
| 3. Djinaki | Divers | 0 | 528 | Non encore payé |
| | Pose moellons | 0 | 118 | |
| 4. Diango | Recherche de piquets | 26 | 0 | Non encore payé |
| | Voie d'accès | 123 | 0 | |
| | Divers | 0 | 70 | |
| | Décapage | 0 | 143 | |
| | Pose moellons | 0 | 143 | |
| 5. Silinkine | Gardiennage, cuisine | 0 | 6 | |
| | Fouille ouvrages, divers | 0 | 29 | |
| | Travaux et services divers | 0 | 33 | |
| | Dégagement talus, voie d'accès, Fournit. piquets | 274 | 0 | |
| 6. Bounkiling | | | | Situation incomplète |
| 7. Ndiana | Décapage et divers | | 160 | |
| | Fouille ouvrages | | 38 | |
| | Déblai | | 29 | |
| 8. Samine Escalc | Voie d'accès | 250 | | |
| | Décapage et divers | | 160 | |
| | Déblai | | 29 | |
| | Fouille ouvrage | | 38 | |
| Birkama | Divers | | 643 | Situation incomplète |
| TOTAL *: 3451 | | 1,174 | 2,277 | |

* Campagne inachevée

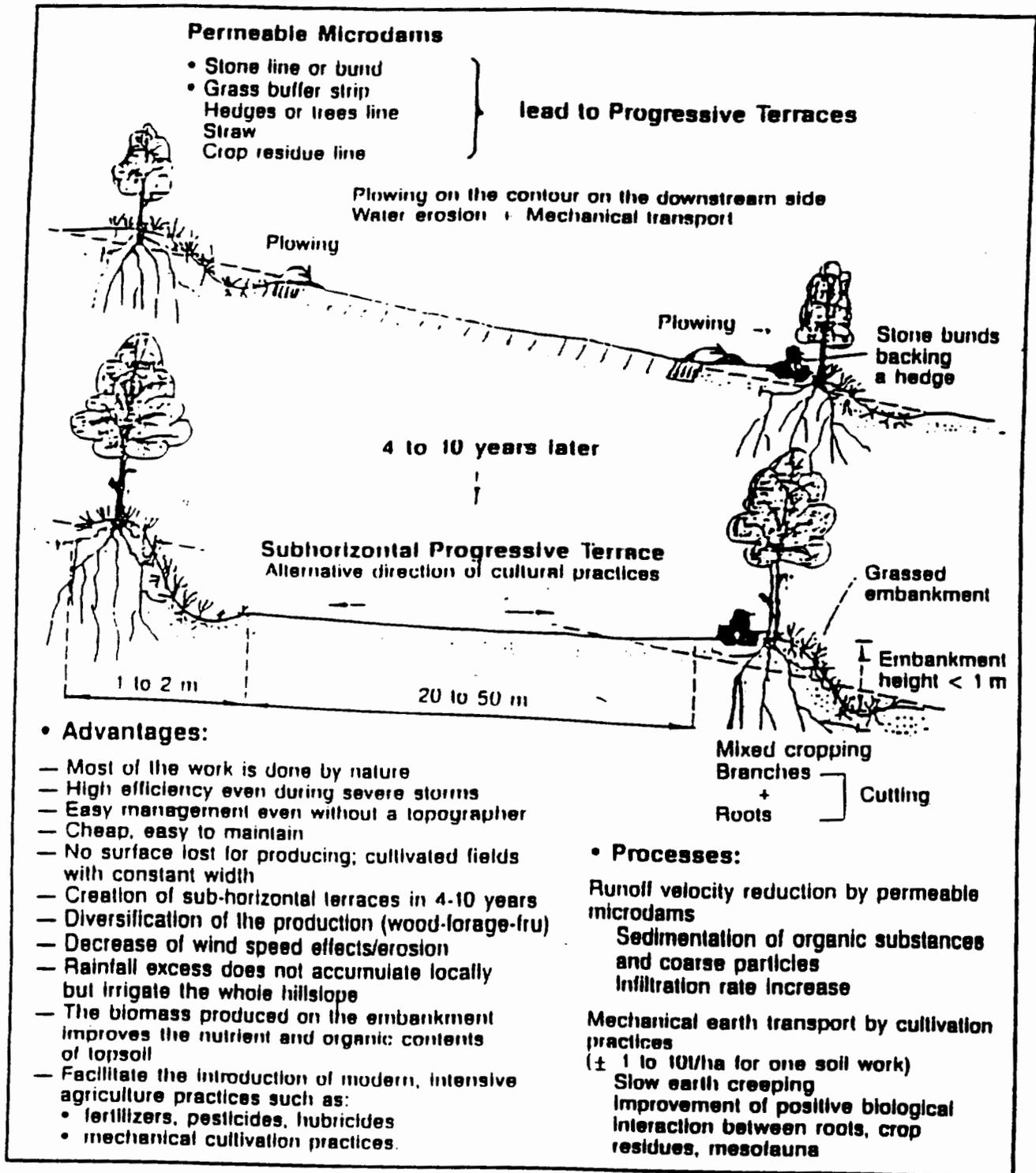
FIGURE 3.7

Results of Contour Berm Test at
Djinaki

| Vallée | caractéristiques diguettes | | | | date de démarrage des travaux | date fin des travaux | total participants population | | | Quantité de terre mise en oeuvre | Total jours de travail | Total heures de travail | Coût opération (sans tenir compte du coût de la participation population) | Coût évalué de la seule participation de la population |
|----------------|----------------------------|---------------------------------------|-----------------------|-----------------------|-------------------------------|----------------------|-------------------------------|------|-------|----------------------------------|------------------------|-------------------------|---|--|
| | Longueur | Hauteur | Largeur | Pente talus | | | H | F | Total | | | | | |
| | m | m | m | | | | | | | | | | | |
| DJINAKI | 777 | Tronçon I = 0,85 Tronçon II = 0,40 | I = 0,85 II = 0,50 | I = 1/1,5 II = 1/2 | 18 Janvier 1995 | 16 Juin 1995 | 1701 | 1405 | 3106 | 863 | 102 | 693 | 4 432 050 | 4 608 159 ** |

FIGURE 3.8

SAMPLE MULTI-MEASURE SOIL CONSERVATION PLAN



Schematic representation of an integrated land use layout for the Nathenje Area, Lilongwe Northeast Rural Development project, Malawi.

3.3.4 Water Management Manual

A general Water Control Structure Operations and Maintenance Manual was developed, which is being applied on the dikes as they become operational. The VWMC and IVWMC are responsible for these operations and maintenance activities, with assistance from the SZWMP personnel, the Regional Inspectorates of Hydraulics and NGOs in the valleys.

The Water Management Manual was field tested during the 1995/96 season. Based on this experience, refinements were carried out for two valleys: Colomba and Silinkine. These provide model applications that are being replicated in all the valleys. The model application for each valley includes tables for recording hydraulic conditions (quality and quantities), and guidance for the management of the gates to promote the recovery of the soils. Each valley will therefore have its own manual containing valley-specific data, including a monography of basic physical conditions and technical specifications of the structures. Copies of these manuals should be maintained in the SZWMP offices, as well as in the valleys.

The process of soil recovery in relation to the management of water levels is documented, among other reporting in a monography specified by Dr. Wayne Hudnell, of Louisiana State University. This process involves the promotion of the reduction of acidity by maintaining anaerobic action. The key element in this process is to maintain moisture in the soil for the longest possible period, including salty water during the dry season.

The testing of the manual in 1995 was extremely useful in understanding the application of soil and water management principles and agronomic practices at the village level. For example, the first draft of the manual indicated opening the gates to drain the fields for the harvest. However, some of the villagers prefer to maintain water levels even during the harvest, because it is cooler and the stalks are less irritating to people carrying out the harvest. In fact, this solution is preferable for maintaining humid soil conditions as noted above.

It was also found that, in certain areas, such as the Lower Casamance, villagers understand well the principle of opening gates to permit salty water in the fields during the dry season in order to maintain humid conditions, while other zones in the Moyenne Casamance will require further discussion and *sensibilisation* in the committees. It is here that continued use of inter-valley visits will be beneficial.

3.4 Agricultural Development

3.4.1 Extension Activities

The extension approach adopted by the SZWMP to encourage increased rice production was to first put in place demonstration plots (*parcelles pilotes*) for rice cultivation using currently confirmed techniques by research institutes; then to provide a training and extension framework with Village

Support Units (VSUs), or NGOs, to extend these techniques to villagers willing to adopt them. The plots were located on various soil and water management conditions along the toposequence of the valleys, and served as important focal points for extension, village organization and field days among the different valleys. They were jointly chosen by the PROGES technicians and the VWMCs. Three main criteria were applied:

- proximity to the anti-salt or water retention dikes to demonstrate management of the gates;
- representativeness of various soils and topographic conditions identified in the earlier studies; and
- accessibility and visibility for demonstration purposes.

In each valley, a tri-partite agreement was carried out between the PROGES, the VWMC and the Valley Support Unit (or NGO assisting in extension work). The main responsibilities of each party were:

PROGES

- Furnish improved seeds, fertilizer, crop protection and plowing
- Technical assistance, through workshops, technical information sheets and visits, in water management and crop production

Village Committee

- Supply the land for the demonstration plots
- Supply labor for the collective management of the plots
- Follow the recommended technical packages
- Define the mode of distribution of the harvest between the committee and the owner of the land

Valley Support Unit/NGO

- Follow up the management of the demonstration program
- Organize training sessions for extending the recommended technical packages
- Assist the farmers to identify and obtain inputs in a timely and cost-effective manner

Three basic technology packages were developed, corresponding to three broad soil types found in the valleys:

- **Acid or Salty soils**, located in the lower valleys, and abandoned because of salinization and/or acidification, and recoverable only with water management and soil amendments.
- **Hydromorphic soils**, located in the lower valleys, currently cultivated or cultivable, not influenced by salt water, and capable of yield increases with water management and improved techniques.

- **Upland soils**, located in the sandy plateaus of the upper valleys, currently cultivated or cultivable, who are subject to frequent water deficit.

Figure 3.9 shows the cropping calendar used in the demonstration plots. **Figure 3.10** shows the types of improved rice varieties recommended for various soil and water management regimes. The principal themes were:

- parcel preparation
- deep tractor plowing³
- mineral and organic fertilizers
- selecting varieties according to locality
- correct upkeep and phytosanitary treatment

Figure 3.11 shows the areas and results of the demonstration plots carried out through the 1994 season.

The investment of the villagers in these techniques primarily involved the purchase of fertilizers and selected seeds. It was found that these purchases are outside the scope of most villagers, due to the large price increases (more than 50%) following the devaluation, and lack of reasonable credit (interest rates about 17%).

For these reasons, the project introduced two new themes in the 1994/95 season:

- **Production and use of compost.** With the U.S.-based NGO Rodale International, two programs to produce compost pits in fourteen valleys were carried out starting in December 1994. **Figure 3.12** presents the achievements to date, as well as a local training illustration. As of the beginning of the 1995 growing season, about 560 mature pits are available for use during the 1995/96 season.
- **Seed production in the valleys.** The problem for seeds was less a problem of cost than of availability. The *Projet Autonome Semencier* (PAS) cannot satisfy the seed requirements of the valleys. Nguindir alone, for example, requires more than six tons of seed. In collaboration with the PAS and Winrock International, VSUs and responsible farmers, a plan to train farmers in the seed production techniques was carried out.

The results of the demonstration parcels were reported on an annual basis. This report includes recommendations for further research and extension priorities. The results of this assessment for the 1994/95 season are summarized in **Figure 3.13**.

³ In certain valleys of Bignona, hand plowing using the local technique of "kandiandou" was encouraged. On salinized or moderate acid soils, the deep plowing was followed by the making of ridges to facilitate leeching and evacuation of toxic substances when the gates are opened. On other soils, individual parcels, small berms were created to ensure an even distribution of water in space and over time.

FIGURE 3.9
PREVISIONAL CROPPING CALENDAR

| TRAVAUX EFFECTUES | PERIODE |
|---|--|
| <p>Aménagement parcellaire</p> <ul style="list-style-type: none"> · Labour, billonage, émiettage · construction des diguettes <p>Phosphotage et fumure de fonds (compost, DAP)</p> | Mai-Juin |
| <p>Semis des parcelles</p> <ul style="list-style-type: none"> · Parcelles de culture et pépinières des sols non salés · Sols salés | Début Juillet 3 ^{ème} décade d' Août |
| <p>Désherbage/Démariage/Fumure azotée</p> <ul style="list-style-type: none"> · <i>Parcelles de semis direct</i>: deux sarclages au moins avant épandage fractionné d'urée. Les opérations de démariage (plus remplissage des points vides) se feront en condition d'humidité satisfaisante pendant la phase de taillage · <i>Parcelles repiquées</i>: une mise à boue (avant repiquage) suivi de deux sarclages au moins et deux épandages d'urée. Le second apport d'urée peut s'avérer inutile en condition de submersion des parcelles | 21 et 42 ^{ème} jour après semis 15 et 40 ^{ème} jour après repiquage |
| <p>Repiquage des parcelles à 25 ou 30 jours d'âge</p> <ul style="list-style-type: none"> · Sols non salés · Sols salés | Début Août 3 ^{ème} décade de Août |
| <p>Suivi et traitement phytosanitaires</p> <ul style="list-style-type: none"> · Pyriculariose · Termites · Foreurs de tiges | Aux périodes sensibles (fin pépinière et début floraison) Arrêt des pluies Phases plantule et végétative |
| <p>Autres activités</p> <ul style="list-style-type: none"> · épuration des hors-types · Entretien des diguettes · Pose des carrés des rendement · Vidange des rizières · Récolte | Dès apparition Dès nécessaire Après deuxième sarclage ou avant floraison 15 jours avant récolte 30 jours avant récolte après 50% de floraison soit 3 à 3.5 mois pour le semis direct et 1 mois plus tard pour le repiquage |

FIGURE 3.10

RECOMMENDED VARIETIES FOR DEMONSTRATION PLOTS

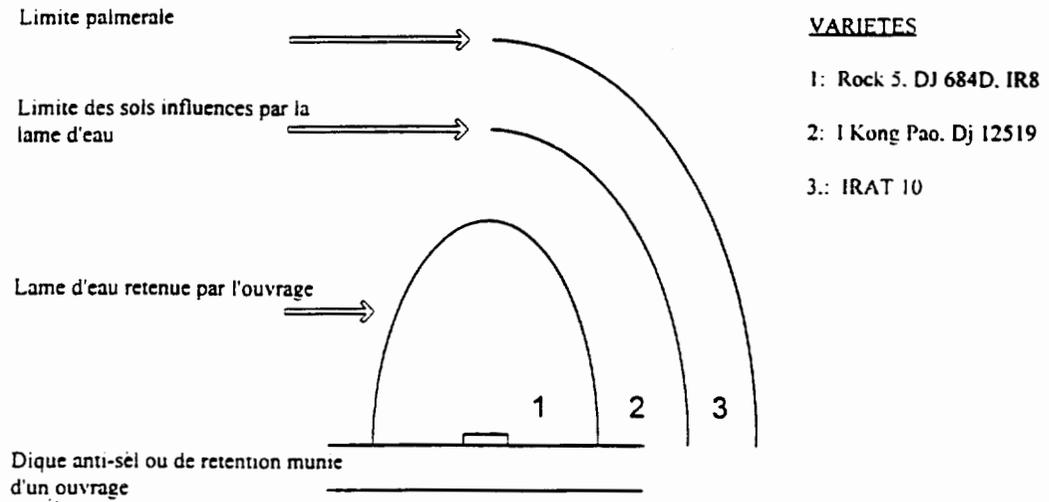


FIGURE 3.11
Results of Demonstration Plots

CAMPAGNE 1992

| Variétés | Mayor | Nguindir | Observations |
|------------|-------|----------|-----------------------------------|
| IRAT 10 | 2901 | 2553 | Parcelle pluviale / Semis direct |
| DJ 12519 | 3000 | 3251 | Parcelle de nappe / Semis direct |
| I KONG PAO | 2960 | 2859 | Parcelle de nappe / Semis direct |
| DJ 684D | 2800 | 2279 | Parcelle inondée / Semis direct |
| | 1600 | 1418 | Parcelle salée / Repiquage |
| | - | 3153 | Parcelle non salée / Repiquage |
| ROCK 5 | - | 2941 | Parcelle non salée / Semis direct |
| | 2600 | 2732 | Parcelle non salée / Repiquage |
| | 1700 | 1513 | Parcelle salée / Repiquage |

| Vallées | Nombre parcelles | Superficies emblavées | Participation population (*) | |
|--------------|------------------|-----------------------|------------------------------|-----------|
| | | | Hommes | Femmes |
| Mayor | 4 | 3,45 | 0 | 61 |
| Nguindir | 4 | 2,38 | 0 | 20 |
| Total | 8 | 5,83 | 0 | 81 |

(*): Les parcelles ont été exploitées individuellement; les propriétaires de sous-parcelles constituaient le groupe de contact de l'encadrement technique

CAMPAGNE 1993

| Zone d'influence | IRAT 10 | DJ 12519 | I KONG PAO | DJ 684D | ROCK 5 |
|--------------------------------|---------|----------|------------|---------|--------|
| Parcelles sans effets de digue | 995 | 789 | 537 | 472 | 1751 |
| Parcelles avec effets de digue | 2633 | 3242 | 2841 | 3211 | 3211 |
| Facteur multiplicatif | 2,6 | 4,1 | 5,3 | 6,8 | 1,9 |

| Vallées | Nombre parcelles | Superficies emblavées | Participation CVGE (*) |
|-----------------|------------------|-----------------------|------------------------|
| Badobar | 6 | 2,4 | 6 |
| Kounouding Dioé | 5 | 4,8 | 11 |
| Kandion Mangana | 4 | 1,3 | 4 |
| Total | 15 | 8,5 | 21 |

Figure 3.11 continued

Tableau 4c: Résultats du programme de démonstration / Vallées gestion 1994

• Superficies emblavées et participation population

| Vallées | Nombre parcelles | Superficies emblavées | Participation population | | |
|--------------|------------------|-----------------------|--------------------------|-------------|-------------|
| | | | Hommes | Femmes | Total |
| Djimandc | 4 | 1,6 | 53 | 99 | 152 |
| Balingorc | 6 | 3,6 | 82 | 338 | 420 |
| Diatang | 2 | 1,1 | 42 | 51 | 93 |
| Bona | 6 | 4,5 | 70 | 549 | 619 |
| Bougnadou | 4 | 2,1 | 43 | 339 | 382 |
| Talito | 4 | 2,4 | 88 | 144 | 232 |
| Toniataba | 4 | 3 | 92 | 378 | 470 |
| Ségafoula | 7 | 4,4 | 53 | 573 | 626 |
| Total | 37 | 22 | 523 | 2471 | 2994 |

• Rendements (kg/ha) obtenus dans les parcelles pilotes

| Situation hydrique de la parcelle | Vallée | Parcelles | Variétés pluviales (IRAT 10) | Variétés de nappe (DJ 12519, IKP) | Variétés aquatiques (TR 8, DJ 684D, ROK 5) | |
|---|----------------|------------|------------------------------|-----------------------------------|--|-------------|
| Parcelles sans effets de digue (Terres en amont des vallées) | Talito | B. Soucoto | 3600 | 3500 | | |
| | | kouyenala | 2970 | 4300 | | |
| | Bougnadou | Babady | 2330 | 2300 | | |
| | | Darsalam | 1800 | 2400 | | |
| | Ségafoula | Fassada | 2163 | 3050 | | |
| | | Yarang | 1300 | 2400 | | |
| | Bona | Kanghody | | 2030 | | |
| | Diatang | Anti-sel | 4200 | 3800 | | |
| | Balingore | Djirokir | 1270 | 2400 | | |
| | Moyenne | | | 2454 | | 2908 |
| Ecart type | | | 993 | 746 | | |
| Parcelles avec effets de digue (Terres influencées ou submergées par la lame d'eau) | Talito | Talito | | 3050 | 2800 | |
| | Bougnadou | Taiba | | | 3300 | |
| | Djimande | Mandégane | | | | 3900 |
| | | Djimande | | | | 3000 |
| | Bona | Bona | | | 3900 | 3200 |
| | | Mambigné | | | 4400 | 3050 |
| | | Kapoundou | | | 3800 | 3000 |
| | | Niaoup | | | 3730 | 2400 |
| | Diatang | Rétention | | | | 3060 |
| | | Anti-sel | | | 3025 | |
| | Toniataba | Manécounda | | | 2700 | 3040 |
| Santhiaba | | | | 3360 | 2700 | |
| Moyenne | | | | 3495 | 3041 | |
| Ecart type | | | | 524 | 359 | |

FIGURE 3.12 STATUS OF COMPOST PROGRAM (PROGRAMS I, II and III)

| Vallées | Situation Avril 94 (1 ^{er} prog.) | | | Situation Avril 95 (2 ^{ème} prog.) | | Total disponible (1) + (2) | Production disponible estimée (KG) |
|------------------|---|---------------------|-----------------------------------|--|-----------------------------------|-------------------------------|--|
| | Fosses remplies | Fosses utilisées | Fosses ⁽¹⁾ stockées | Fosses vides | Fosses ⁽²⁾ remplies | | |
| Mayor | 53 | 26 | 27 | 21 | 27 | 54 | 43200 |
| Nguindir | 4 | 3 | 1 | 3 | 39 | 40 | 32000 |
| Badobar | 37 | 28 | 9 | 54 | 46 | 55 | 44000 |
| Kandion Mangana | 14 | 14 | 0 | 4 | 13 | 13 | 10400 |
| Kounounding Dioé | 8 | 8 | 0 | 10 | 4 | 4 | 3200 |
| Balingore | 7 | 0 | 7 | 0 | 27 | 34 | 27200 |
| Djimande | 3 | 0 | 3 | 0 | 20 | 23 | 18400 |
| Diatang | 1 | 0 | 1 | 6 | 60 | 61 | 48800 |
| Bona | 59 | 0 | 48 | 0 | 14 | 62 | 49600 |
| Bougnadou | 11 | 0 | 8 | 13 | 52 | 60 | 48000 |
| Talto | 12 | 4 | 8 | 0 | 69 | 77 | 61600 |
| Toniataba | 8 | 0 | 8 | 9 | 41 | 49 | 39200 |
| Ségafoula | 13 | 1 | 12 | 0 | 18 | 30 | 24000 |
| Total | 230 | 84 | 132 | 120 | 430 | 562 | 449600 |

NB: Il s'agit de fosses à trou unique d'un volume moyen de 3m³. La production d'une fosse est estimée à 800 kg soit 40 bassines à linge. Le total disponible correspond au nombre de fosses près pour utilisation pendant l'hivernage 1995 et les cultures de contre saison (maraîchage)

FAITES DU COMPOST POUR :

- Augmenter la quantité de matière organique
- Conserver l'humidité du sol
- Améliorer et maintenir la fertilité du sol
- ◆ Réduire l'acidification des sols
- ◆ Réduire l'érosion
- ◆ Aider au contrôle des mauvaises herbes
- Réduire les dépendances vis-à-vis de l'engrais chimique.



Le compost : un engrais naturel à la portée des paysans

FIGURE 3.13

RESEARCH AND EXTENSION RECOMMENDATIONS

| THEMES TECHNIQUES | RECHERCHE/ DEVELOPPMENT | VULGARISATION | ZONES AGRO-HYDRALOGIQUES | ACTEURS |
|---|--|--|--|---------------------|
| Travail du sol & Confection des diguettes | Instrument de travail plus performant | - | Nguindir et Mayor | Recherche |
| | - | Traction animale dans les casiers rizicoles | Nguindir et Mayor | ONG |
| Semis direct à la ligne | - | Utilisation de rayonneur | Nguindir, Mayor et Bignona | ONG |
| | - | Traction animale/labour au tracteur | Nguindir et Mayor | ONG |
| Utilisation de semences sélectionnées | - | Variétés usuelles notamment aquatique et de nappe; IKP en repiquage est recommandé | Bignona | ONG |
| | - | Variétés usuelles surtout de nappe; ROK 5 et DJ 684 en semis direct dans le bas-fonds sont possibles | Nguindir et Mayor | ONG |
| Fumure de redressment | Compost seul ou avec coquillage broyé pour sols acides | - | Nguindir, Mayor et Bignona | Recherche et PROGES |
| | - | Phosphogypse ou phosphate tricalque | Nguindir, Mayor et Bignona | ONG |
| Fumure de fonds et d'entretien | Réduction de l'apport d'urée sur terres amendées de compost | - | Nguindir, Mayor et Bignona | ONG |
| | - | 18-16-0 (DAP) Urée | Nguindir, Mayor et Bignona | ONG |
| Gestion du plan d'eau | Variétés de riz de haute taille (plus de 1m) et résistantes à la verse | - | Parcelles en amont des ouvrages Nguindir, Mayor et Bignona | Recherche et PROGES |
| | Définition des modalités de gestion du plan d'eau en amont des ouvrage | - | - | |

3.4.2 Rice Area Potentials and Production

Potential areas for rice production have been estimated in the developed valleys. This is shown for each valley in **Figure 3.14** and graphically in **Figure 3-14a**. Areas are divided into three categories:

- **Total area**, calculated on the measured area of the *bas fonds* as presented in the 1:50,000 topographic maps. As these maps date to the 1950s, this area can be considered to represent the historical potential rice areas, since much of this land has been lost to saline or deficit conditions.
- **Inundated area (*Inondables*)**, based on a calculation of the maximum storage level in relation to the elevation area curves upstream of each dike, as derived from detailed 1:5,000 topographic maps.
- **Influenced (*Influences*) area**, or the area outside the flooded area, which is influenced by the dike through the water table (assumed to be one meter beyond the limit of the flooded area)
- **Remaining area (*Restant*)**, which are areas not directly benefiting from the dikes but could benefit from soil and water conservation measures, such as contour berms. These are noted as *Deficitaires* in **Figure 3.14**, however, some of these areas are susceptible to underground springs, which would enable them to grow water table rice. As the rainfed areas also compete to some extent with other rainfed cereals, such as millet and maize, the areas indicated in the figure can be considered minimum potential areas.

In addition, two valleys, Talito and Bounkiling, show zero hectares for remaining areas. This is because the area potentially flooded and influenced by the dikes exceeds the original measured area for the valley on the older topographic maps. In these cases, the water control structures will contribute to the expansion of the valley beyond its originally perceived limits. Based on the measured rice areas discussed below, these area estimates may be revised in the future.

Rice areas and production in the valleys have been estimated through a census of rice fields carried out annually since 1993 by the Regional Inspectorates of Agriculture (IRAs). The results of the 1993/94 and 1994/5 season measurements are shown in **Figure 3.15**. When measuring areas, rice is divided into three main categories: (I) flooded rice; (ii) water table rice; and (iii) rainfed rice.

3.5 NGO and Village Support Structures

3.5.1 Village Water Management Committees

The Inter-Village and Village Water Management Committees comprise the fundamental organizational framework for improved soil and water management in the valleys. The long term

FIGURE 3.14

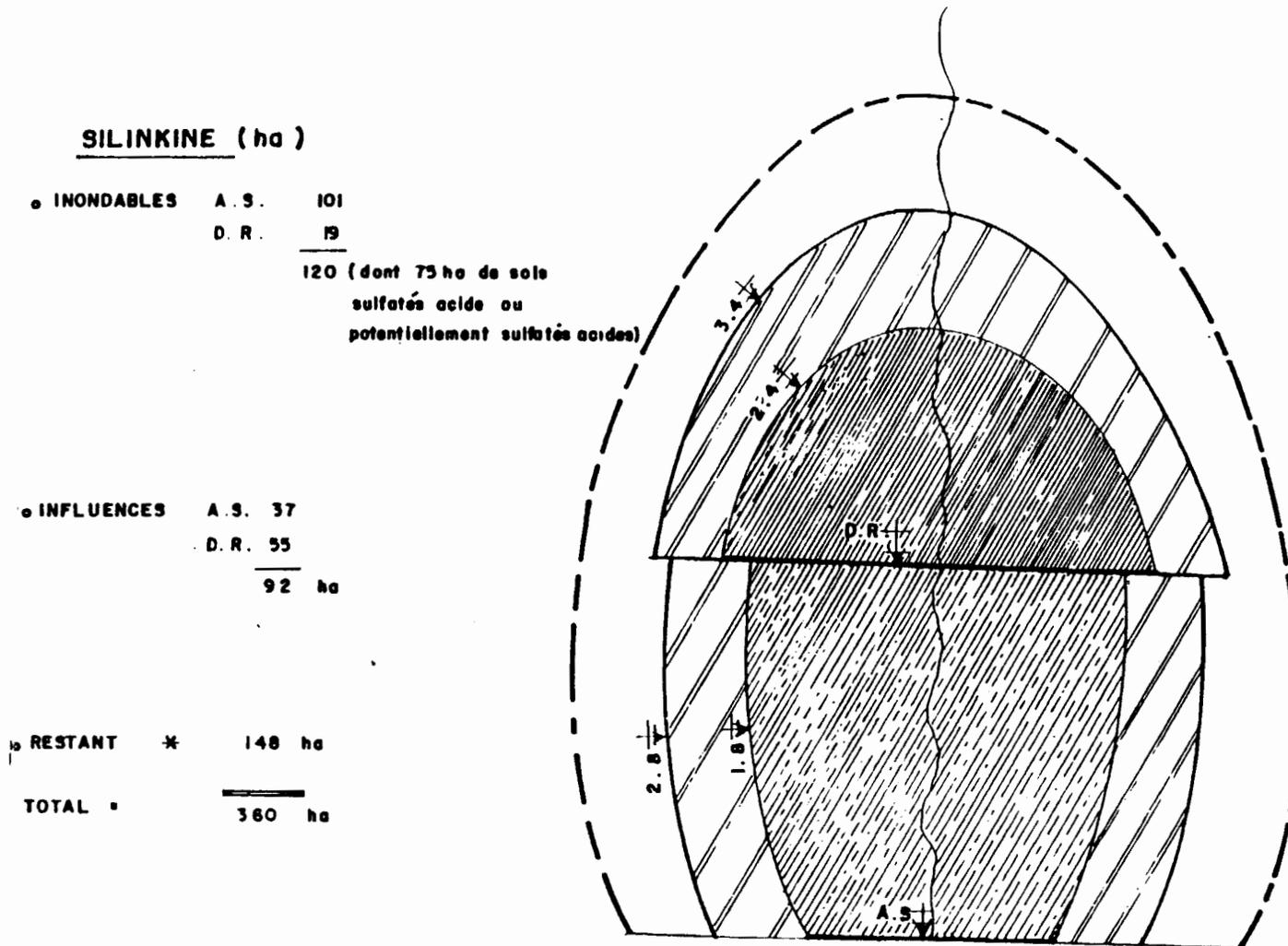
IMPACT DES RETENUES SUR LES SURFACES DES VALLEES

| PROGR. | VALLEE | SURFACES (ha) | | | | |
|--------------|--------------|---------------|-------------|-------------|---------------|--------------|
| | | Totales | Inondabl | Influencées | Bénéficiaires | Déficitaires |
| I | MAYOR | 197 | 21 | 45 | 66 | 131 |
| | NGUINDIR | 572 | 379 | 86 | 465 | 107 |
| II | KANDION M. | 400 | 90 | 57 | 147 | 253 |
| | BADOBAR | 1000 | 444 | 288 | 732 | 268 |
| | KOUNOUND. | 480 | 165 | 103 | 268 | 212 |
| | BALINGHOR | 410 | 74 | 75 | 149 | 261 |
| | DJIMANDE | 487 | 68 | 112 | 180 | 307 |
| | DIATANG | 170 | 49 | 45 | 94 | 76 |
| III | BONA | 300 | 183 | 82 | 265 | 35 |
| | TALITO | 119 | 94 | 54 | 148 | 0 |
| | BOUGNADOU | 212 | 109 | 69 | 178 | 34 |
| | TONIATABA | 174 | 34 | 54 | 88 | 86 |
| | SEGAFOULA | 1227 | 183 | 102 | 285 | 942 |
| | SILINKINE | 360 | 120 | 92 | 212 | 148 |
| | DJINAKI | 550 | 104 | 124 | 228 | 322 |
| IV | BIRKAMA | 447 | 240 | 110 | 350 | 97 |
| | SAMINE | 1260 | 782 | 250 | 1032 | 228 |
| | BOUNKILING | 210 | 172 | 91 | 263 | 0 |
| | NDIAMA | 191 | 89 | 69 | 158 | 33 |
| | DIANGO | 690 | 100 | 125 | 225 | 465 |
| | COLOMBA | 244 | 103 | 138 | 241 | 3 |
| | DJIMAKAKOR | 498 | 332 | 228 | 560 | 0 |
| TOTAL | 10198 | 3935 | 2399 | 6334 | 4008 | |

| PROGR. | SURFACES (ha) | | | | |
|--------------|---------------|-------------|-------------|---------------|--------------|
| | Totales | Inondabl | Influencées | Bénéficiaires | Déficitaires |
| I | 769 | 400 | 131 | 531 | 238 |
| II | 2947 | 890 | 680 | 1570 | 1377 |
| III | 2942 | 827 | 577 | 1404 | 1567 |
| IV | 3540 | 1818 | 1011 | 2829 | 826 |
| TOTAL | 10198 | 3935 | 2399 | 6334 | 4008 |

1) This corresponds to the rainfed areas that could benefit from soil and water conservation.

FIGURE 3.14a
 TERRES DE LA VALLEE DE SILINKINE
 BENEFICIAINT DES DEUX DIGUES



* LA SUPERFICIE RESTANTE EST CELLE DES TERRES SUSCEPTIBLES D'ÊTRE AMELIOREES PAR DES MESURES DE CONSERVATION DES SOLS.

FIGURE 3.15
SITUATION COMPARATIVES DES SUPERFICIES, DES RENDEMENTS
ET PRODUCTIONS DANS LES VALLEES

Area, Yields and Production
(IRA Surveys)

| Programme/ vallée | 1993 | | | 1994 | | | Première année de mise en eau |
|----------------------|-------------------------------|---------------------------|-------------------|-------------------------------|---------------------------|-------------------|----------------------------------|
| | Superficies cultivées (HA) | Rendement moyen (T/HA) | Production (T) | Superficies cultivées (HA) | Rendement moyen (T/HA) | Production (T) | |
| PROGRAMME I | | | | | | | |
| Mayor | 99.65 | 1.22 | 121.38 | 267.5 | 0.96 | 256.45 | 1992 |
| Nguindir | 183.21 | 1.78 | 325.78 | 174.36 | 0.69 | 120.69 | 1992 |
| Sous-total | 282.86 | 1.58 | 447.16 | 441.86 | 0.85 | 377.14 | |
| PROGRAMME II | | | | | | | |
| K. mangana | 87.92 | 0.91 | 80.33 | 104.76 | 0.94 | 98.12 | 1993 |
| Badobar | 624.36 | 1.27 | 792.42 | 770.23 | 1.19 | 912.58 | 1995 |
| K. Dioé | 145.89 | 1 | 145.89 | 175.46 | 0.69 | 120.69 | 1993 |
| Balingor | * | | | 111.85 | 1.06 | 118.73 | 1994 |
| Djimande | * | | | 177.79 | 0.74 | 131.37 | 1994 |
| Diatang | * | | | 93.99 | 0.55 | 51.6 | 1994 |
| Sous-total | 858.17 | 1.18 | 1018.64 | 1434.08 | 0.99 | 1433.09 | |
| PROGRAMME III | | | | | | | |
| Bona | * | | | 125.84 | 1.66 | 207.7 | 1994 |
| Talito | * | | | 52.81 | 1.42 | 74.85 | 1994 |
| Bougnadou | * | | | 233.75 | 1.26 | 285.36 | 1994 |
| Toniataba | * | | | 136.54 | 1.6 | 219.03 | 1994 |
| Ségafoula | * | | | 389.38 | 1.24 | 490.36 | 1994 |
| Silinkine | * | | | 90.38 | 0.57 | 51.45 | 1995 |
| Djinaki | * | | | 211 | 0.7 | 148.44 | 1995 |
| Sous-total | * | | | 1239.7 | 1.19 | 1477.19 | |
| PROGRAMME IV | | | | | | | |
| Birkama | * | | | 437.87 | 1.26 | 550.05 | 1995 |
| Samine Escale | * | | | 327.88 | 0.78 | 257.97 | 1995 |
| Boukiling | * | | | 183.72 | 1.66 | 304.04 | 1995 |
| Ndiama | * | | | 244.12 | 2.04 | 498.58 | 1995 |
| Diango | * | | | 278.59 | 0.74 | 206.73 | 1995 |
| Colomba | * | | | 168.12 | 0.63 | 105.93 | 1995 |
| Djimakakor | * | | | 103.68 | 0.99 | 102.75 | 1995 |
| Sous-total | * | | | 1743.98 | 1.16 | 2026.05 | |
| Total Général | 1141.03 | 1.28 | 1465.8 | 4859.62 | 1.09 | 5313.47 | |

*/ 1993 data collected only for five valleys

Sources: Inspections régionales de l'Agriculture de Kolda et Ziguinchor / 1993; 1994

success of the program depends on their interest, participation and dynamism. In the long term, the IVWMCs can become economic interest groups (*groupement d'interet economique -- GIE*), providing a range of support services for its members. To date, four IVWMCs have achieved this status: Nguindir, Badobar (COGEBRA), Talito (NAFA) and Toniataba (GIVATO). **Figure 3.16** summarizes the location and membership of the IVWMC. In all, the SZWMP has supported 176 village committees, involving 183 villages in the 22 valleys.

3.5.2 NGO Program

In order to effectively provide continual extension and awareness training in the numerous valleys, the project enlisted the temporary services of Non-Governmental Organizations (NGOs) or Farmer Associations from within the valley (*Organisations Paysannes -- OP*). The justification for the NGO program was that PROGES did not have the staff to ensure grass-roots follow-up for water management and agricultural extension. The utilization of NGOs and OPs addresses this problem by providing an interface with rural communities for building sustainable rural economies, while maintaining contact with traditional GOS support services (Regional Inspectorates of Agriculture and Hydraulics, *Centres d'Expansion Rurale* and *Comunitees Rurales*).

The general scheme was that one member of the NGO or OP would remain in the valley with the population as a permanent animateur or animatrice, referred to the Valley Support Units (VSU).

In practice, several of the valleys modified this approach so that the OP, as an indigenous organization, became the VSU. **Figure 3.17** presents the NGOs and OPs in each valley. The basic tasks of the NGOs, OPs and VSUs include:

- Organize the work teams and villager contribution for the construction for paid and unpaid work.
- Assist the negotiation and payment procedures between the contractor and the IVWMC.
- Ensure that payment procedures are followed and documented (through *Fiches de Recapitulation de Travaux Payes*).
- Train villagers in the management of the revolving fund.
- Train and assist in agricultural extension and implementation of the demonstration plots, including developing linkages with credit sources.
- Train and assist in the management, operations and maintenance of the sluice gates, dikes and other water control structures.
- Train and assist in the construction and maintenance of contour berms.

FIGURE 3.16

LOCATION OF INTERVILLAGE AND VILLAGE
WATER MANAGEMENT COMMITTEES

| Vallées | Villages polarisés | Nombre de CVGE | Présidents CIVGE | Lieu de Résidence |
|------------------|--------------------|----------------|---------------------|-------------------|
| NGUINDIR | 17 | 10 | Ibrahima MANDIANG | NGUINDIR |
| MAYOR | 10 | 9 | Mamadou SANE | MAYOR |
| K.MANGANA | 11 | 13 | Omar DJIBA | KANDION MANGANA |
| KOUNOUNDING DIOE | 8 | 12 | Mamadou BADJI | KOUNOUNDING DIOE |
| TALITO | 5 | 5 | Youssouph SANE | TALITO |
| BOUGNADOU | 6 | 5 | Kéba Dioulaba CISSE | TAIBA |
| TONIATABA | 6 | 6 | Ansoumana CORREA | BAMBALY |
| SEGAFOULA | 13 | 13 | Kounama SADIO | YARAN |
| BADOBAR | 23 | 21 | Karamo DRAME | KAROUMBOU |
| NDIAMA | 5 | 5 | Karamo SEYDI | NDIAMA |
| BOUNKILING | 14 | 12 | Landing SAMBOU | TOBOR |
| BONNA | 7 | 8 | Chérif BADJI | NIAHOUMP |
| SILINKINE | 5 | 4 | Mamadou L. DIEME | SILINKINE |
| DIANGO | 13 | 13 | Malamine DIEME | DIANGO |
| COLOMBA | 5 | 5 | Landing Sobéa DIEME | COLOMBA |
| DJIMAKAKOR | 4 | 4 | Justin DIEME | DJIMAKAKOR |
| BALINGHOR | 1 | 6 | Lamine simon DIEME | BALINGHOR |
| DJIMANDE | 3 | 5 | Lamine DIEME | DJIMANDE |
| DIATANG | 3 | 3 | MFamara A. BODIAN | DIATANG |
| DJINAKY | 5 | 7 | Soussette DIEDHIOU | DJINAKI |
| SAMINE ESCALE | 10 | 10 | Abdoulaye BIAYE | SAMINE ESCALE |
| BIRKAMA | 9 | 9 | Edouard SADIO | BIRKAMA |
| TOTAL | 183 | 176 | | |

FIGURE 3.17

CURRENT STATUS OF NGO/PO/SZWMP COLLABORATION

| N° | Vallées | ONG/OP | CVGE | Animateurs | | | Observations |
|-------|------------------|----------------|------|------------|----|-------|--|
| | | | | F | H | Total | |
| 1 | Nlayor | MFR | 9 | 1 | 2 | 3 | |
| 2 | Nguindir | FORM'ACTION | 10 | 0 | 1 | 1 | |
| 3 | Badobar | FORM'ACTION | 21 | 0 | 1 | 1 | |
| 4 | Kandion Mangana | ADECOR | 13 | 1 | 1 | 2 | 2 Sur décision du CIVGE, seule la coordination est assurée par un agent d'ADECOR pour un an à compter de juillet 1995. |
| 5 | Kounounding Dioé | UAV de K. Dioé | 12 | 0 | 3 | 3 | L'ERGES de Sédhiou apporte un appui technique hebdomadaire à la vallée |
| 6 | Balinghor | CORD | 6 | 1 | 1 | 2 | |
| 7 | Djinande | CORD | 5 | 0 | 2 | 2 | 2 nouveaux agents ont remplacé ceux antérieurement en place |
| 8 | Diatang | ADECOR | 3 | 0 | 1 | 1 | 1 Sur décision du CIVGE, seule la coordination est assurée par un agent d'ADECOR |
| 9 | Bona | UAV de Bona | 8 | 0 | 2 | 2 | |
| 10 | Bougnadou | 7A | 5 | 0 | 1 | 1 | |
| 11 | Ségafoula | FADECBA | 13 | 1 | 1 | 2 | |
| 12 | Talito | FORM'ACTION | 5 | 0 | 1 | 1 | 1 Substitution de l'agent par celui antérieurement en fonction à Badobar |
| 13 | Toniataba | FORM'ACTION | 6 | 0 | 1 | 1 | |
| 14 | Silinkine | AGADA | 4 | 1 | 0 | 1 | |
| 15 | Djinaki | AGADA | 7 | 0 | 1 | 1 | |
| 16 | Birkama | FORM'ACTION | 9 | 1 | 0 | 1 | |
| 17 | Sanine Escala | FADECBA | 10 | 0 | 1 | 1 | |
| 18 | Boukiling | MFR | 12 | 0 | 1 | 1 | |
| 19 | Ndiana | 7A | 5 | 0 | 1 | 1 | |
| 20 | Diango | AGADA | 13 | 0 | 1 | 1 | |
| 21 | Colomba | CORD | 5 | 1 | 0 | 1 | |
| 22 | Djimakakor | CORD | 4 | 0 | 1 | 1 | |
| TOTAL | | | 176 | 7 | 24 | 31 | |

Number of NGOs = 6
 Number of OPs = 2

As the number of valleys increased, it was felt that PROGES's limited resources could be complemented by two regionally-based NGOs with broader management capabilities, referred to as Technical Service NGOs (TSNGOs). The TSNGOs would then provide direct assistance to the VSUs or NGOs in each valley. A main objective of the TSNGO program would be to assist the village committees to generate sources of income in order to sustain operations and maintenance of the water management structures, as well as utilize progressive agricultural techniques.

A bidding and selection procedure was set up and tenders were received. A TSNGO was selected in November 1995, for implementation in January 1995, under the 18-month extension period. However, it has also been recommended that, due to limited funds, the project may continue working directly through the NGOs in the valleys with the close collaboration of the Regional Inspectorates and the Rural Expansion Centers.

3.5.3 Support to Women

A pilot training program was carried for 76 women from the Valleys of Balinghor and Mayor in 1994, in collaboration with a World Bank-supported program entitled, *Femmes et Formation en Gestion Appliquee (FEFGA)* and the Institute for Economic Development. This program was considered so successful that a broader program involving 14 valleys were carried out in 1995. The program involved six workshops of three weeks each. Women leaders from the initial valleys made up the training teams as the program evolved. While women are the focal point of these activities, men also participate in the training activities. The *FEFGA* program works through the existing valley committees and entails three components:

1. Introduction to the Program (*Sensibilisation*).
2. Modular Training. There are three modules:
 - **Human and Group Resource Management**, focusing on analyzing problems and identifying management approaches to solve these problems
 - **Marketing**, focusing on ways to find markets and achieve increased income
 - **Micro-Project Management**, focusing on financial management, planning and evaluation.
3. Evaluation and Follow-Up (*Seances de Suivi*)

Figure 3.18 summarizes the *FEFGA* activities to date and the level of participation. Since its inception, 3,364 persons have participated in this program, of which over 75% were women.

FIGURE 3.18

PARTICIPATION IN FEFGA WOMEN'S PROGRAM

A. PARTICIPATION AUX SEANCES DE SENSIBILISATION

| Vallées | Sensibilisateurs | Participation des populations | | | Durée |
|---|---|-------------------------------|------------|--------------|------------|
| | | Total | Hommes | Femmes | |
| Février 95 (5 vallées) Bona Diatang Bougnadou Toniataba Birkama | Abdou Karim Ndione (FEFGA) Djibril Sané (Animateur CORD/Djimande) Diarra Sané (Animatrice 7A) | 1.009 | 307 | 702 | 06-10/02 |
| Mars 95 (4 vallées) k. Mangana Diango Badohar K. Dioé | Djibril Sané (Animateur CORD/Djimande) Diarra Sané (Animatrice 7A) | 487 | 146 | 341 | 27/03-3/04 |
| Avril 95 (3 vallées) Dimande Talito Nguindir | Djibril Sané (Animateur CORD/Djimande) Diarra Sané (Animatrice 7A) | 140 | 45 | 95 | 24-28/04 |
| TOTAL GENERAL | | 1.636 | 498 | 1.138 | |

B. FORMATION

| Mois | Durée | Vallées | Modules | Participants |
|----------------------|-------|---|---|--------------|
| Février 1995 | | Bona Bougnadou | Gestion des ressources humaines et Marketing | 60 |
| Mars 1995 | | Bona, Diatang Bougnadou Toniataba, Birkama | Gestion des ressources humaines / Marketing / Micro-projets | 121 |
| Avril 1995 | | Badohar, K. Dioé K. Mangana Diango | Gestion des ressources humaines / Marketing / Micro-projets | 116 |
| Mai 1995 | | K. Mangana Diango, Djimande Nguindir, Talito Segafoula | Gestion des ressources humaines / Marketing / Micro-projets | 143 |
| TOTAL GENERAL | | | | 440 |

C. SUIVI

| Vallées | Période | Villages visités | Participation | | |
|-----------------|----------------|---|---------------|------------|--------------|
| | | | Hommes | Femmes | Total |
| Diatang | 4/05 au 6/05 | Diaboudior, Baila Katipeu; Diatang | 69 | 136 | 205 |
| Toniataba | 13/05 au 16/05 | Bamahali; Toniataba Manécounda; Santhiaba Dioudoubou; Bissari | 30 | 42 | 72 |
| Kandion Mangana | 20/05 au 23/05 | Sankandi; Saré Tenneng Tambacounda; Faraba; Sindialon; Gombol; Sanécounda Kandion Mangana | 63 | 236 | 299 |
| Diango | 20/05 au 26/05 | Diango; Diabir, Djiniépè Médiégue; Djiringoumane; Bougoutoup; Margoune; Silick; Tankoron-Goungoulon; Djipakoun; Diagoper; Bouto | 226 | 486 | 712 |
| Total | | | 388 | 900 | 1.288 |

3.5.4 Financial Sustainability - Revolving Funds

Recognizing that the long term sustainability depends on the villagers' capacity to finance operations and maintenance, the project sought ways to generate income and mobilize savings for this purpose.

In Program I, revolving funds were generated in the two pilot valleys, Mayor and Nguindir, by lending a tractor to the IVWMCs and the generation of income derived from those tractor services. In ensuing programs, the funds were generated primarily through:

- sales of demonstration plot products
- payment of certain labor from construction
- communal contributions (*cotisations*)

An evaluation of the revolving fund programs was carried out in August 1993. The study found that variations to the basic approach were applied, depending on the particular valley, and that a major constraint was the lack of legal and formal structures to manage the fund. The Valley of Nguindir, where the IVWMC organized a *Groupement d'Interet Economique (GIE)*, provides a good example of the possibilities of integrating the SZWMP structures into sustainable rural economic activity.

It is also noteworthy that a locally-initiated movement to organize a **Federation of Intervalley Water Management Committees** is afoot. This Federation, when given a legal status would pool resources and knowledge of the IVWMCs in support of development in the SZWMP-supported valleys. Savings could then be mobilized for broader regional development priorities and expanding the benefits of the initial water management programs.

Figure 3.19 shows the situation of the Revolving Funds as of October 1995.

FIGURE 3.19
STATUS OF REVOLVING FUNDS

| N° | Vallée | Montant collecté | Sources | Montant épargné | | Montant dans la vallée | |
|---------------|---------------|------------------|---------|------------------|-----------|------------------------|------------------|
| | | | | Somme | Organisme | Disponible | A recouvrer |
| 1 | Badobar | 475,000 | 1,3* | 475,000 | CAPEC** | | 700,000 |
| 2 | Ségafoula | 559,610 | 1, 2 | 559,610 | CBAO | | 72,250 |
| 3 | Djimande | 145,000 | 1, 2 | 145,000 | CNCAS | 51,767 | |
| 4 | Balinghor | 477,000 | 1, 2 | 270,000 | CBAO | | |
| 5 | Mayor | 578,513 | 2,3,4 | 578,513 | CBAO | | |
| 6 | Talito | 653,000 | 1,5 | 653,000 | CAPEC | | |
| 7 | Toniataba | 263,300 | 1 | 263,300 | CAPEC | | 159,050 |
| 8 | Bougnadou | 412,500 | 2 | 412,500 | CIVGE | 421,500 | |
| 9 | Ndiama | 377,500 | 1 | 337,400 | CIVGE | 67,500 | |
| 10 | K. Dioé | 100,000 | 2 | 99,160 | CIVGE | 99,160 | |
| 11 | Bona | 377,400 | 1 | 377,400 | CIVGE | 377,400 | |
| 12 | Nguindir(2) | | 4 | | | | |
| 13 | K. Mangana | 309,150 | 1,5 | 309,150 | CIVGE | 309,150 | |
| 14 | Silinkine | 319,460 | 1 | 319,460 | CIVGE | 319,460 | |
| 15 | Djinaki | 212,750 | 1 | 212,750 | CIVGE | 212,750 | 337,750 |
| 16 | Birkama | 400,000 | 1,2 | 400,000 | CMS | | |
| 17 | Samine Escale | 142,600 | 1 | 142,600 | CIVGE | 142,600 | |
| 18 | Diango | 207,955 | 1 | 207,955 | CIVGE | 207,955 | 39,000 |
| 19 | Colomba | 242,000 | 1 | 242,000 | CIVGE | 242,000 | |
| 20 | Djimakakor(1) | | | | CIVGE | | |
| 21 | Diatang | 372,000 | | 372,000 | CIVGE | 372,000 | |
| 22 | Bounkiling | 225,000 | 1 | 225,000 | CIVGE | 225,000 | 20,000 |
| TOTAUX | | 6,849,738 | | 6,376,798 | | 3,048,242 | 1,328,050 |

(1) La situation sera communiquée par le CIVGE en décembre.

(2) Situation indéterminée.

* Code sources: 1= Rémunération de l'entreprise; 2= Cotisation; 3= Vente de cartes de membres

4= Prestations offertes par le PROGES (labours, Prog. I); 5= Commercialisation de semences de riz

** Organismes: CBAO, CAPEC, Crédit mutuel du Sénégal,

Tésorière CIVGE,

4. INSTITUTIONAL STRENGTHENING

4.1 Overview

The SZWMP design emphasized capacity strengthening of government agencies, village groups, and non-governmental/private sector groups. This was in keeping with the GOS New Agricultural Policy which intended to target the technical ministries for improvement; foster the development of the private and non-governmental sectors; and mobilize and encourage local populations to develop and manage resources.

“Institutionalizing” SZWMP activities was accomplished through training of the various beneficiary groups. The human capital enhancement program in the SZWM Project, therefore, became a major element in attempting to sustain growth and development and achieve project goals.

In this context, the major objective is to build local institutions that can plan and implement watershed management plans as well as carry on the process of land reclamation and sustainable production. This is a collaborative effort of: (I) the Government of Senegal; (ii) village organizations; and (iii) the private sector. Summarized below are the overall objectives for training directed at these three major beneficiary groups.

Government of Senegal

The general objective was to develop a capacity in the Regional Inspectorates of Agriculture and Rural Engineering of the Ministry of Rural Development and Hydraulics in the Ziguinchor and Kolda regions to carry on the planning and implementation of project activities after 1995. This involved:

On-the-job training to develop standard, yet adaptable, methodologies and approaches to watershed management and planning that will enable the GOS to continue to guide and coordinate the activities of the village committees and the private sector.

Long-term training to build a high level of technical and managerial capacity among the members of the Regional Inspectorates to carry out the guidance and coordination of the activities of village committees and the private sector. Four masters level degrees were planned.

Short-term training to afford an opportunity to develop specific skills through short courses and observe related activities in other projects and countries.

Seminars and workshops to provide a forum for the exchange of information and experiences with other projects and activities in Senegal; to review progress and present findings of applied research with USAID, GOS, and other institutions.

Meetings with the local administrators (Prefets, Sous-prefets, etc.) To educate them on the process of watershed management and the coordination of activities involving the village water user committees and private contractors. This involves meetings to inform and discuss the objectives of the project, the role of the administration, and various modes of support the administration plays in promoting this activity.

Village Groups

The general objective was to enable the farmers to effectively participate in the planning and implementation of watershed management plans and to increase their cereal production through improved land and water management. The major organizational framework for this was the village-level water management committees (VWMC) and the inter-village water management committee (IVWMC). This involved:

Village meetings and training sessions to explain the process of watershed management, land reclamation, and the relationships between the physical structures and land and water management; to improve organization and management capacity of the VWMC and IVWMC; and to achieve farmers' inputs and their direct influence in the planning and implementation process.

Field demonstrations and extension to provide direct extension to the villagers in soil and water management, land reclamation, and improved cultural practices.

Workshops and seminars to allow farmers and farm groups to share experiences and observe various approaches to land and water management that can be adapted to their situations.

Private Sector

The general objective was to improve the capability of the private sector to provide certain services in support of watershed development activities. This was in keeping with a general development policy to increase the role of the private sector in economic development. The services strengthened included:

- construction contractors
- non-governmental organizations (NGOs)
- other support and technical services such as topography and soil surveys.

Training and institutional development activities for the private sector included:

On-the-job training to assist firms in contract bidding and contract management as well as upgrading the technical quality of their work; to assist NGOs in supporting and participating in watershed development planning and implementation.

Workshops and seminars to provide a forum for training sessions on all aspects of technical, financial, and organizational management of construction firms as well as “training of trainers” among participating NGOs.

These training activities have been grouped into three major programs:

- Long Term Overseas Program
- Short-Term U.S. and Third Country Program
- Short-Term In-Country Program

An overview of the accomplishments for these programs is summarized in **Figure 4.1**. These are more fully described in the following sections.

4.2 Long-term Overseas Training

4.2.1 Program Design and Start-up

Given the clear mandate by both the project paper and the RFP with regard to the design of the long-term M.S. level training, the Project made a careful analysis of the various scenarios for this program. Based on an assessment of the program emphasis and target applicant pools, tailor-made programs for each of the academic programs were then designed with LSU, and a schedule for the program implementation was drawn up. Concurrently, selection criteria were also developed, revised, and finally the selections were made.

In formulating the academic course work/thesis research components, LSU considered the fact that the Project Paper referenced “civil engineering” and “soil and water management”; while the IEE amendment provided more specific guidance including the need for training in “soil chemistry,” “ground water hydrology,” and “agronomy.” From the future environmental perspective for the Casamance, a “strong focus on tropical coastal systems” was emphasized.

Based on the above, the following areas were deemed essential for the long-term training programs:

- a) Soil Science
- b) Hydrology
- c) Agronomy/Extension
- d) Civil Engineering

In addition, building capacity to monitor the environmental impact of project interventions was judged important, and the long-term training programs presented an excellent opportunity to provide a core group of technical personnel who could train others in the region. Thus, individualized M.S. level study programs fall within the above four categories, but include course work and/or minors in environmental science and extension education.

FIGURE 4.1
SUMMARY OF TRAINING PROGRAMS

| Désignation | Nombre de sessions | Nombre de participants | | |
|---|--------------------|------------------------|-------------|---------------|
| | | Femmes | Hommes | TOTAL |
| Le long terme à l'étranger | 4 | 0 | 4 | 4 |
| Le court terme à l'étranger | 10 | 1 | 19 | 20 |
| Le court terme au Sénégal | 26 | 16 | 204 | 220 |
| Démultiplication de la formation en Indonésie | 13 | 325 | 285 | 610 |
| FEFGA | 33 | 2,478 | 886 | 3,364 |
| Séminaires | 16 | Indéterminé | Indéterminé | 1,170 |
| Formation villageoise | 59 | 3,078 | 904 | 6,506 |
| Visites organisées intervalées | 40 | 622 | 622 | 1,244 |
| TOTAL | 148 | | | 13,138 |

Another factor that was considered was that the institutional strengthening in human resource development was aimed at two regions, namely Kolda and Ziguinchor. The selection, the type of training imparted, and subsequent assignment of trained personnel recognized the needs of the two regions.

The M.S. level training was originally scheduled to begin during the second year of the project (June 1991 - May 1992) so that the candidates could be reintegrated into the project implementation program in the fourth year. Due to various delays, however, training for the Agronomist and the Agronomist/Extension Specialist began in the early part of the 4th year (October 1993), and the program for the Engineers began in the latter part of the 4th year (May 1994). Thus, the bulk of these training programs were conducted (and are continuing, at this writing) during the last two years of the project and beyond.

4.2.3 Specific Programs

Relevance to the development needs of the region and applicability of the results were key attributes to the design of the research programs for the M.S. level training programs. Since the candidates selected were professionals, already functioning in the regions of project intervention, they articulated research plans that addressed key issues and problems in the Kolda and Ziguinchor regions. The proposals were refined with inputs from the Project Technical Team and the National Project Director. Provided in this sub-section are brief descriptions of the research currently conducted by the four candidates at LSU/Senegal.

Mr. Ibrahima Thiam -- Hydrological Monitoring

Mr. Ibrahima Thiam's research proposal is entitled: "*Modeling water transfer in an estuarine area - application to the management of anti-salt and water retention dikes realized by the SZWMP in the Casamance*". The control of fresh and salt waters and their interaction are main factors in the development of small watersheds. The hydrologic systems in the coastal areas such as those in the Casamance are very complex for the use of empirical methods, hence, Mr. Thiam's research program proposes to use mathematical models for conceptual and practical applications. Physical parameters used in water management such as surface and watershed runoff; dimensions of control structures; and interaction of fresh and salt waters on either side of anti-salt dikes, could be determined by the application of the kinds of models to be developed in the study.

The specific goals of Mr. Thiam's research will be to review previous methods utilized in the region; to study the main concepts of the hydrologic cycle in watersheds; to determine the physical characteristics of small watersheds; to collect baseline data on rainfall and variation of water Figure; to establish the main characteristics of flow and principal rules of water management using anti-salt and water retention dikes; and to compute the catchment water balance.

Mr. Thiam proposes to study one or two watersheds during the Summers of 1995 and 1996. He is expected to finally develop a model that will be a compromise between a complete model that could describe exactly the system under study and a simpler model with reduced parameters to facilitate practical application. Such a model could then be used in the development of a water management program for small watersheds.

This research is expected to result in management strategies for agricultural lands in the watersheds that take into account the different hydro-meteorological parameters through computer based modeling techniques. Through testing of some well known hydrologic models (for their efficiency) as they apply to data from Kolda and Ziguinchor, it is expected that the complexity of the management of the watersheds would be reduced.

Mr. Babocar Ngom -- Stability of Anti-Dikes and Storage Dams

Mr. Ngom's program was unfortunately terminated in July 1995, due to non-performance.

Mr. Ngom's research proposal addressed the "*Stability and seepage problems in anti-salt and storage dams built on compressible foundations in Basse and Moyenne Casamance - an evaluation and recommendations*". The construction of dams on very compressible soils requires that stability and seepage problems are adequately addressed. Mr. Ngom's research was to focus on the methods to evaluate and solve stability and seepage problems. Some of the solutions that will be studied for the prevention of seepage failures will include: vertical foundation barriers; graded filters; and the construction of core walls. Likewise, stability aspects were to be looked at through compaction of earth dams; excavation and sub drainage; and vertical wells constructed in the foundation. To address the conditions prevailing in the Casamance, Mr. Ngom was to also perform an economic evaluation of the solution approaches above to solve stability and seepage problems. The field tests were conducted and data collected by Mr. Ngom during the Summers of 1995.

Mr. Ngom's proposed research is aimed at investigating stability problems of structures erected to store water as well as permit the leaching and other soil management actions. Stability and extended life of the dams and dikes built in the Casamance are important aspects in the continued reclamation of cultivated lands. In assessing common solutions to stabilizing dams and structures, Mr. Ngom was to also study the economics. Thus, it was expected that the experience and knowledge gained by Mr. Ngom would contribute positively to watershed development for the future.

Mr. Alphonse Sagna -- Communication Methods in Casamance Extension

Mr. Alphonse Sagna's research consists of an investigation and evaluation of the agricultural program known as the PNVA in the regions of Ziguinchor and Kolda. He is paying special attention to the communication methods employed by the programs. Mr. Sagna will conduct surveys in the summer of 1995 using 500 samples in each region. These samples will be randomly selected among the villages where farmers participate in the extension program. The above thesis proposal was reviewed by the project Chief-of-Party and the National Project Director in May-June of 1994. A

questionnaire was developed at LSU and refined with input from Ziguinchor to properly adapt to the local conditions in December 1994. A random selection of the villages was also made to apply the field test of the questionnaire. Starting in May, 1995, Mr. Sagna is conducting the actual survey for his thesis research. Mr. Sagna has scheduled the entire period of May 26, 1995 to approximately the end of July, 1995 to complete his research in the field.

The focus of the study by Mr. Sagna is on the communication and teaching methods employed by the Agricultural Extension Program (PNVA) in the Kolda and Ziguinchor regions. The long-term role of PROGES involves the education of, and the harnessing of, the contributions by the villagers and NGOs in the overall development and management of the watersheds to promote sustainable cereal production. Mr. Sagna's research is expected to identify appropriate communication methods in the socio-cultural context of the Lower Casamance.

Mr. Lamine Coly -- Management of Acid Sulfate and Saline Soils

Mr. Lamine Coly's thesis research involves the management of acid sulfate and saline soils in the Casamance. Alluvial zones of the Casamance River are among the best soils sustainable for crop production. In the past two decades, due to decreased rainfall, the soils have become unsuitable for rice production. The decrease in the supply of fresh water and salt intrusion have caused serious problems. Mr. Coly's research aims include looking at flooded and non-flooded conditions and the addition of soil amendments such as the application of gypsum and shells. It is believed that the first crop planted by Mr. Coly failed due to underestimation of amendments, drought immediately after transplanting, and/or other factors he will test at LSU during the summer of 1995. Mr. Coly's field research conducted during the Summer of 1994 was from May 30, 1994 to August 18, 1994. Mr. Coly's time was spent primarily at Ziguinchor and Birkama where the test plots are located. The ISRA station at Djibelor was utilized for basic soil analyses.

Preliminary results of Mr. Coly's research suggest that acidity is not the only problem in the soils. His ongoing research on acidity was reduced through flooding methods, rice failed to grow in the fields under test in the Birkama area. These results suggest that there are other factors including iron and aluminum that could have contributed to the crop failure. Mr. Coly is currently performing laboratory/greenhouse experiments to analyze these factors. It is expected that further field trials will significantly contribute to the identification of strategies that will help reclaim soils as well as sustain the productivity of reclaimed soils.

4.3 Short-term U.S. and Third Country Training

Short-term programs in the U.S. and third countries were targeted for personnel in the technical ministries who would be assembled for SZWMP programs. Technical topics included small dam construction, gate design and water control works. In addition, water management training was also targeted for training in Francophone African countries and other West African nations including Burkina Faso, Morocco, and Sierra Leone. Originally, training in the practical aspects of water user

organizations in a location such as the Philippines was also planned. Mangrove rice production and swamp development were areas targeted for PROGES personnel to be conducted in the south coast of Guinea Bissau and Rokupr, Sierra Leone.

In addition to the above, short-term training programs in the U.S. were considered including: Farming Systems Research and Extension; Soil Testing and Classification and Fertilizer Recommendations; Natural Resource Management; and Irrigation Practices. These programs, however, were ruled out subsequently due to the cost and the difficulty of identifying participants fluent in English. Study tours for the National Directors and a management course for regional inspectors were the only programs conducted in the U.S. **Figure 4.2** summarizes the short term U.S. and Third Country training activities. A total of 20 individuals completed programs in the short-term U.S. and third country category.

Included in these activities was a farmer-to-farmer observation tour on rice production techniques in Indonesia, attended by 3 farmers from the Bona and Djimande Valleys. This was sponsored by the Governments of Indonesia and GOS, while the project met incidental costs. This course was very successful and was followed by 13 follow-up seminars in the other SZWMP valleys (**Figure 4.3**).

4.4 Short-term In-country Training

Short-term programs in Senegal were targeted for four groups of beneficiaries: GOS line ministry personnel; village groups; NGOs; and the private sector. Programs included short courses, seminars demonstrations, and study tours to other project sites within Senegal. A number of programs and activities were conducted under the sponsorship of the SZWM Project as illustrated in **Figure 4.4**.

4.4.1 Programs for GOS personnel

Key GOS technicians including engineers and agronomists were provided technical short courses during the life of SZWM. In addition, computer literacy, financial management, English language training, training in first aid, and training in auto mechanics were provided. In this context, specialists from West African Training Institutions such as WARDA and EIER visited the project to formulate and provide training in areas such as construction in the types of soils found in the Casamance as well as rice production.

4.4.2 Programs for Villagers and NGOs

As indicated in **Figure 4.5**, some of the programs for villagers, village organizations and the local NGOs were conducted in the form of joint NGO/Committee seminars; specific courses, inter-valley visits and finally *Demultiplication*, or the training of other villagers following the initial training activities. For NGOs participating in project activities and interventions, twelve programs were conducted. These included workshops on post project scenarios, crop protection, and methods for

FIGURE 4.2

SHORT TERM U.S. AND THIRD COUNTRY TRAINING

| Activités | Lieu | Période | Participants | | | Origine |
|--------------------------------------|---------------------------------|--------------|--------------|-----------|-----------|---|
| | | | F | H | Total | |
| Techniques rizicoles | Indonésie | Oct-déc. '94 | 1 | 2 | 3 | CIVGE bonna (1) et Djimande (2) |
| Management des Projets | Pittsburg/E.U | Oct-Nov. '94 | 0 | 2 | 2 | IRA de Ziguinchor (1) et de Kolda (1) |
| Protection des végétaux | ADRAO/ Bouaké/CI | Août 94 | 0 | 2 | 2 | IRA de Ziguinchor (1) et de Kolda (1) |
| Production de riz dans les mangroves | ADRAO/ Rokupr/ LIBERIA | Nov '93 | 0 | 2 | 2 | PROGES |
| Etudes impact sur l'environnement | EIER/ Ougadougou/ B. FASO | Mai '93 | 0 | 1 | 1 | PROGES |
| Longévité des barrages en terre | EIER/ Ougadougou/ B. FASO | Fev '93 | 0 | 2 | 2 | DRGRH (1) de Kolda et de Ziguinchor (1) |
| Photo-interprétation | EIER/ Ougadougou/ B. FASO | Oct-nov '94 | 0 | 2 | 2 | PROGES |
| Marchés d'études et de travaux | EIER/ Ougadougou/ B. FASO | Nov. '93 | 0 | 1 | 1 | PROGES |
| Conservation des eaux et des sols | EIER/ Ougadougou/ B. FASO | Mai '93 | 0 | 2 | 2 | IRA de Ziguinchor (1) et de Kolda (1) |
| Visite d'étude des Directeurs | Etats-Unis | Oct. '93 | 0 | 3 | 3 | Direct. PROGES (1) Ministère (2) |
| TOTAL | | | 1 | 19 | 20 | |

FIGURE 4.3
MULTIPLIER TRAINING FOLLOWING INDONESIA SEMINAR ON RICE
PRODUCTION

| N° | Vallée | Animateurs | | | Date | Participation villageoise | | |
|--------------|------------------|------------|---|-------|----------|---------------------------|------------|------------|
| | | F | H | Total | | Femmes | Hommes | Total |
| 1 | Ségafoula | 1 | 2 | 3 | 13/06/95 | 31 | 19 | 50 |
| 2 | Bona | 1 | 2 | 3 | 19/06/95 | 31 | 12 | 43 |
| 3 | Mayor | 1 | 2 | 3 | 19/06/95 | 12 | 8 | 20 |
| 4 | Bougnadou | 1 | 2 | 3 | 15/06/95 | 37 | 15 | 52 |
| 5 | Kandion Mangana | 1 | 2 | 3 | 18/06/95 | 46 | 30 | 76 |
| 6 | Nguindir | 1 | 2 | 3 | 16/06/95 | 19 | 24 | 43 |
| 7 | Talito | 1 | 2 | 3 | 17/06/95 | 21 | 19 | 40 |
| 8 | Kounounding Dioé | 1 | 2 | 3 | 16/06/95 | 18 | 26 | 44 |
| 9 | Toniataba | 1 | 2 | 3 | 14/06/95 | 10 | 14 | 24 |
| 10 | Badobar | 1 | 2 | 3 | 14/06/95 | 16 | 7 | 23 |
| 11 | Djimande | 1 | 2 | 3 | 20/06/95 | 23 | 48 | 71 |
| 12 | Balinghor | 1 | 2 | 3 | 20/06/95 | 32 | 20 | 52 |
| 13 | Diatang | 1 | 2 | 3 | 21/06/95 | 29 | 43 | 72 |
| TOTAL | | | | | | 325 | 285 | 610 |

FIGURE 4.4
SHORT TERM IN-COUNTRY TRAINING

| Activités | Lieu | Période | Participants | | | Origine |
|---|---------------------|-------------------|--------------|------------|------------|---|
| | | | F | H | Total | |
| Aide préparateur des soins | CFP, Dakar | Fév. - Nov. '94 | 0 | 1 | 1 | PROGES |
| Diagnostic participatif | Guerina | déc. '94 | 4 | 24 | 28 | ONG/OP/(23) PROGES (5) |
| Aide laborantin de chantier | CFP, Dakar | Nov. - Déc. '94 | 0 | 3 | 3 | PROGES |
| Topographie | EPT, Thiès | Janvier '94 | 0 | 2 | 2 | PROGES |
| Topographie | CFP, Dakar | Sept. '94 | 0 | 1 | 1 | PROGES |
| Etude de compacité in situ | CFP, Dakar | Fév. '94 | 0 | 2 | 2 | PROGES |
| Stage pratique mécanique auto | Toyota, Dakar | Nov. '93 | 0 | 1 | 1 | PROGES |
| Le foncier et la gestion des ressources naturelles en Afrique | Mbao | Fév. - Mars '94 | 0 | 2 | 2 | PROGES (1) ISRA (1) |
| Gestion/Soci-écon. des projets d'irrigation | Saint-Louis | Janv. '94 | 0 | 1 | 1 | PROGES |
| Conducteur des travaux | CFP, Dakar | Nov. '93 | 0 | 3 | 3 | PROGES |
| Conducteur des travaux | CFP, Dakar | Fév. '94 | 0 | 3 | 3 | PROGES |
| Initiation à l'utilisation du TOPCON | Vallée PROGES | Nov. '93 | 0 | 2 | 2 | PROGES |
| production de riz au Sahel | Saint-Louis (ADRAO) | Mars 95 | 0 | 1 | 1 | PROGES |
| Cours d'anglais | Ziguinchor | Avr./ Août '93 | 2 | 24 | 26 | PROGES |
| Cours d'anglais | Ziguinchor | Oct. '94 /Mai 95 | 0 | 4 | 4 | PROGES |
| Informatique (autocad) | Ziguinchor | Fév. '94 | 0 | 21 | 21 | PROGES |
| Informatique | Ziguinchor | Mars '93 | 1 | 16 | 17 | PROGES |
| Informatique | Ziguinchor | Juin '93 | 3 | 16 | 19 | PROGES |
| Informatique | Ziguinchor | Fév./ Mai '94 | 4 | 18 | 22 | PROGES |
| Informatique | Ziguinchor | Oct./Déc. '94 | 2 | 7 | 9 | PROGES |
| Cours par correspondance de Mécanique auto | EDUCATEL (France) | Mai'94/Avril 95 | 0 | 1 | 1 | PROGES |
| Stage agents techniques de l'agriculture | PROGES | Juillet/ Août '93 | 0 | 2 | 2 | Ecole des Agents Techniques de l'Agriculture (Ziguinchor) |
| Stage CNEARC (étude socio-éco. vallées) | PROGES | Mai/Août 95 | 0 | 1 | 1 | CNEARC (Montpellier) |
| Secours, premiers soins (chauffeurs) | PROGES | Nov./ Déc '93 | 0 | 10 | 10 | PROGES |
| Séminaire d'information des entreprises | Kolda | Nov. '94 | 0 | 19 | 19 | Entreprises |
| Séminaire d'information des entreprises | Ziguinchor | Octobre '94 | 0 | 19 | 19 | Entreprises |
| TOTAL | | | 16 | 204 | 220 | |

FIGURE 4.5
IN-COUNTRY SEMINARS

| Activités | Lieu | Période | Participants | | | Origine |
|--|-----------------------------------|------------------|--------------|----|--------------|---|
| | | | F | H | Total | |
| Visite d'échanges dans la vallée du fleuve Sénégal | Saint-Louis et région | Juin-juillet '94 | 0 | 14 | 14 | PROGES (1) CIVGE (1) ONG (12) |
| Evaluation et mise a niveau sur le compostage | Guérina | Novembre '94 | 6 | 31 | 37 | PROGES (7) ONG (30) |
| Production de semences | Ziguinchor | Juin '94 | 2 | 23 | 25 | PROGES (4) ONG (18) CIVGE (3) |
| Séminaire ONG sur la protection des cultures | Guérina | Décembre '94 | 0 | 7 | 7 | |
| Séminaire pour ONG collaborant avec le PROGES | Ziguinchor | Avril '94 | 5 | 31 | 36 | PROGES (5) ONG (28) CIVGE (3) |
| Séminaire pour ONG collaborant avec le PROGES | Kolda | Fevrier '93 | 1 | 18 | 19 | PROGES (8) ONG (11) |
| Séminaire pour ONG collaborant avec le PROGES | Ziguinchor | Déc. '93 | | | 25 | |
| Collaboration avec ONG | M. Findiféto Toniataba | Juin/Juillet '94 | | | 128 | CIVGE M. F. (43) CIVGE Tomiat. (83) |
| " | Talito Bougnadou | Juin/Juillet '94 | | | 90 | CIVGE Talit. (45) CIVGE Bougn. (45) |
| " | Balinghor Djimande/ Diatang | Juin Juillet '94 | | | 393 | 131 par CIVGE |
| " | Badobar K. Mangana k.Dioé | Juin Juillet '94 | | | 160 | K.M. (55) Badob. (55) K. Dioé (50) |
| Comités de gestion de l'eau | Dpt Sédhiou et Bignona | Janvier/Fév. '95 | | | 13 | PROGES (6) ONG (7) |
| Concertation avec CIVGE et ONG | Djibélor | Juin '95 | 11 | 44 | 55 | CIVGE ((37) ONG (12) PROGES (6) |
| Preparation de la campagne 1995 | Guérina | Mai 1995 | 20 | 40 | 60 | CIVGE (44) ONG (11) PROGES (5) |
| Concertation - évaluation PROGES ONG | Guérina | Nov. 95 | 6 | 28 | 34 | ONG (29) PROGES (5) |
| Reformulation du PROGES | Ziguinchor | Mars 95 | 3 | 71 | 74 | GoS(5) USAID (6) ONG/OP (2) ISRA (2) DRGRH (4) IRA(2) PROGES (10) CIVGE (43) |
| TOTAL | | | | | 1,170 | |

parcel management. Since the mid-term evaluation identified the weakness of the IVWMCs including their lack of understanding of their roles, “rapid rural appraisal” programs for NGOs in conjunction with PROGES staff were conducted. The aim of these programs were to encourage village populations to elect more appropriate managers. Other programs for NGOs included the area of Agriculture Extension Techniques.

In addition to the demonstration plots and inter-valley visits over the life of the project, recently organized programs for the village populations and village organizations were conducted on a valley by valley basis in areas such as sluice gate management; compost preparation and follow-up (by Roadale International); crop protection; and seed multiplication (**Figure 4.6**). In addition to these technical areas, *sensitization* programs where the experiences of the villages from one area in the project were shared with their counterparts in other valleys (Inter-Valley Visits shown in **Figure 4.7**). These programs permitted the sharing of both technical as well as managerial techniques, expertise, and experiences.

4.4.3 Programs for Private Sector Contractors

In addition to on-the-job training imparted by the technical assistance team to the participating private contractors (primarily in the construction of the dikes), formal programs including prequalification services, training in the presentation of specifications, cost calculations and construction were provided.

FIGURE 4.6
VILLAGE-LEVEL TRAINING

| Activités | Lieu | Date | Participants | | | Origine |
|---|----------------------------------|----------------|--------------|------------|--------------|----------------------------|
| | | | F | H | Total | |
| Compostage (Rodale) | Mayor | Janvier 94 | 20 | 30 | 50 | CIVGE |
| Compostage (Rodale) | Nguindir | Janvier 94 | 29 | 14 | 43 | CIVGE |
| Compostage (Rodale) | kandion M. | Janvier 94 | 30 | 25 | 55 | CIVGE |
| Compostage (Rodale) | Badobar | Janvier 94 | 30 | 25 | 55 | CIVGE |
| Compostage (Rodale) | K. Dioc | Janvier 94 | 40 | 10 | 50 | CIVGE |
| Compostage (Rodale) | Ségafoula | Mars 94 | 66 | 17 | 83 | CIVGE |
| Compostage (Rodale) | Talito | Mars 94 | 34 | 11 | 45 | CIVGE |
| Compostage (Rodale) | Bona | Mars 94 | 44 | 14 | 58 | CIVGE |
| Compostage (Rodale) | Balinghor | Mars 94 | 43 | 88 | 131 | CIVGE |
| FEFGA/Formation des formateurs | Djibélor | Janvier '95 | 18 | 9 | 27 | CIVGE (11) ONG/OP (16) |
| FEFGA/Formation des formateurs | Thiès | Juillet '94 | 6 | 0 | 6 | CIVGE (4) ONG/OP (2) |
| FEFGA/ micro-projets (femmes leaders) | Guérina | Juin '94 | 24 | 0 | 24 | CIVGE |
| FEFGA/ marketing (femmes leaders) | Guérina | Juin '94 | 26 | 0 | 26 | CIVGE |
| Gestion des ressources/ humaines (femmes leaders) | Ziguinchor | Juin '95 | 21 | 0 | 21 | CIVGE |
| FEFGA/Formation des formateurs | Guérina | Janvier '94 | 22 | 9 | 31 | CIVGE (17) ONG/OP (14) |
| Gestion des vanes | Vallées | Août/Sept95 | 73 | 129 | 202 | CIVGE (178) ONG/OP (24) |
| Démultiplication formation compostage (estimations) | Vallées (Prog I à III) | Jan.94/Jan. 95 | | | 1,894 | CIVGE |
| Pratiques rizicoles (Parcelles pilotes) | Mayor Nguindir | Campagne 92 | 81 | 0 | 81 | |
| Pratiques rizicoles (Parcelles pilotes) | Badobar K. Dioc K. Mangana | Campagne 1993 | | | 630 | |
| Pratiques rizicoles (Parcelles pilotes) | toutes vallées Prog. III | Campagne 1994 | 2,471 | 523 | 2,994 | |
| TOTAL | | | 3,078 | 904 | 6,506 | |

FIGURE 4.7
INTERVALLEY VISITS CONDUCTED
(1992, 1993 AND 1994)

| N° | Progr. | Vallée visiteuse | Vallée visitée | Nombre de participants | Mois |
|-------------------|-------------------------|----------------------|----------------------|------------------------|-----------------------------|
| 1 | II | Badobar | Nguindir | 8 | Juin et oct. 92 |
| 2 | II | K. Dioé | Nguindir | 8 | Juin et oct. 92 |
| 3 | II | K. Mangana | Mayor | 8 | Juin et oct. 92 |
| 4 | I | Mayor | Nguindir | 10 | Mai 92 |
| 5 | I | Nguindir | Mayor | 10 | Mai 92 |
| TOTAL 1992 | | | | 44 | |
| 1 | Actuellement hors prog. | Madina F. | Nguindir | 24 | Juin et oct. 93 |
| 2 | III | Bona | Mayor | 42 | Juin et oct. 93 |
| 3 | III | Talito | Mayor | 45 | Juin et oct. 93 |
| 4 | III | Toniataba | Badobar | 30 | Juin et oct. 93 |
| 5 | III | Bougnadou | Nguindir | 18 | Juin et oct. 93 |
| 6 | III | Ségafoula | Badobar | 48 | Juin et oct. 93 |
| 7 | III | Djimande | Nguindir/ Mayor | 60 | Juin et oct. 93 et sept. 94 |
| 8 | III | Balinghore | Nguindir/Mayor | 58 | Juin et oct. 93 et sept. 92 |
| 9 | III | Diatang | Nguindir/ K. Mangana | 64 | Juin et oct. 93 et sept. 92 |
| TOTAL 1993 | | | | 389 | |
| 1 | IV | Djinaki | Diatang | 22 | Septembre 94 |
| 2 | IV | Baila Katipeu (H.P*) | Diatang | 22 | " |
| 3 | IV | Diégoune (H.P.) | Djimande | 22 | " |
| 4 | IV | Djimakakor | Djimande | 22 | " |
| 5 | IV | Colomba | Djimande | 22 | " |
| 6 | IV | Diango | Bona | 21 | " |
| 7 | IV | Silinkine | Bona | 22 | " |
| 8 | IV | Diagnon (H.P.) | Ségafoula | 33 | " |
| 9 | IV | Boukiling | Bona | 22 | " |
| 10 | IV | Ndiana | Talito | 18 | " |
| 11 | IV | Birkama | Ségafoula | 33 | " |
| 12 | IV | Samine Escate | Ségafoula | 33 | " |
| 13 | I | Mayor | Séléky** | 22 | Novembre 94 |
| 14 | III | Bona | Séléky** | 22 | Novembre 94 |
| TOTAL 1994 | | | | 336 | |

Figure 4.7 (continued)
INTERVALLEY VISITS CONDUCTED
(1995)

| Session | No. | Vallées visiteuses | Vallées visitées | Nombre de participants visiteurs | Mois |
|-------------------|-----|--------------------|--|----------------------------------|-----------|
| 1 | 1 | Balingor | Djimande | 7 | Sept. '95 |
| | 2 | Djinaki | | 7 | Sept. '95 |
| | 3 | Colomba | | 8 | Sept. '95 |
| 2 | 4 | Djimakakor | | 13 | Sept. '95 |
| | 5 | Diatang | | 14 | Sept. '95 |
| | 6 | Bona | | 12 | Oct. '95 |
| 3 | 7 | Diango | Mayor (parcelles compostées) | 12 | Oct. '95 |
| | 8 | Silinkine | | 17 | Oct. '95 |
| 4 | 9 | Bounkiling | Bougnadou (parcelles compostées) | 15 | Oct. '95 |
| | 10 | Ndiama | | 16 | Oct. '95 |
| 5 | 11 | Colomba | Balinghore (parcelles compostées) | 17 | Oct. '95 |
| | 12 | Djimakakor | | 18 | Oct. '95 |
| | 13 | Djimande | | 16 | Oct. '95 |
| 6 | 14 | Djinaki | Diatang (parc. compostées) | 14 | Oct. '95 |
| | 15 | K. Dioé | Talito (parc. compostées) | 17 | Oct. '95 |
| 7 | 16 | Samine Escale | Toniataba (parcelles compostées) | 16 | Oct. '95 |
| | 17 | Birkama | | 16 | Oct. '95 |
| 8 | 18 | Diango | Bona (Diguettes sur courbes de niveau, récupération des terres salées et distribution, gestion du plan d'eau) | 16 | Nov. '95 |
| | 19 | Silikine | | 16 | Nov. '95 |
| | 20 | K. Mangana | | 16 | Nov. '95 |
| 9 | 21 | Mayor | | 16 | Nov. '95 |
| | 22 | Bounkiling | | 16 | Nov. '95 |
| | 23 | Ndiama | | 16 | Nov. '95 |
| 10 | 24 | Bougnadou | | 16 | Nov. '95 |
| | 25 | Talito | | 16 | Nov. '95 |
| | 26 | K. Dioé | | 16 | Nov. '95 |
| 11 | 27 | Nguindir | | 16 | Nov. '95 |
| | 28 | Badobar | | 16 | Nov. '95 |
| | 29 | Toniataba | | 16 | Nov. '95 |
| 12 | 30 | Ségafoula | 16 | Nov. '95 | |
| | 31 | Samine Escale | 16 | Nov. '95 | |
| | 32 | Birkama | 16 | Nov. '95 | |
| TOTAL 1995 | | | | 475 | |

5. OPERATIONAL AND APPLIED RESEARCH/ENVIRONMENTAL, NATURAL RESOURCE MANAGEMENT AND PROJECT MONITORING

5.1 Overview

The original Statement of Work called for two additional components:

- **Operational and Applied Research**, which involved a study of the effects of a major anti-salt structure in the region: the Affiniam Dam, as well as carrying applied research on the processes of water management, soil reclamation and improved agronomic practices.
- **Environmental, Natural Resource Management and Project Monitoring**, which involved the determination and monitoring of potential environmental consequences of water management structures, as well as carrying out monitoring and evaluation of the program's impact.

Following several short term assignments, it was determined that there was considerable overlap between these components. Furthermore, the contract budget combines these activities into one line item. Thus, for the Final Report, these have been combined into one major component, with the following activities:

- Programmatic Environmental Review
- Operational, Applied Research and Environmental Monitoring -- Cooperative Agreement with ISRA
- Project Monitoring and Evaluation

While all activities can be considered monitoring, the first two activities generally address longer term operational and applied research questions, while the third provides on-going information and feedback to project management, USAID and GOS.

5.1 Programmatic Environmental Review

Because of the nature and extent of this infrastructure project, it was deemed advisable to carry out a Programmatic Environmental Review (PER), in conformance with Regulation 22 CFR 216, which requires environmental review and monitoring of AID development activities.

The final version of the PER was completed in March 1994.⁴ It included:

- a comprehensive review of existing conditions and potential environmental impacts of the project interventions;
- an initial assessment of the severity of potential impacts;
- an identification and assessment of various project alternatives;
- recommended measures for mitigation and avoidance of impacts; and
- a comprehensive plan to integrate the applied research and environmental monitoring/mitigation program

Twelve potential environmental impacts were identified during an Environmental Scoping Session, which was carried out in conjunction with the Regional Environmental Officer from Abidjan. These potential impacts identified were:

- Malaria incidence increase
- Schistosomiasis incidence increase
- Aquatic/habitat/wetland loss
- Effects on birds
- Threatened and endangered species
- Surface water quality
- Groundwater quality
- Soil quality
- Reduction in mangroves
- Use of chemical fertilizers and pesticides
- Forest resource loss
- Crop diversity loss

The assessments in the PER found that, based on current knowledge, the only clearly potential impact foreseen is the loss of aquatic habitat for fish. Following this assessment, five project alternatives were considered:

- | | |
|----------------|--|
| Alternative I | No action (USAID would not provide any assistance) |
| Alternative II | Conduct interventions only in areas with existing impoundments, such as roads and earlier dams (construction in previously impacted areas) |

⁴ Considerable delays were experienced in the completion of the PER due primarily to security considerations. The Research Supervisor rescheduled his trip three times during 1992-93.

| | |
|-----------------|--|
| Alternative III | Conduct interventions only in the Affiniam Dam area (a major dam on one of the largest tributaries on the Casamance River, the Bignona River) |
| Alternative IV | Interventions planned in all river valleys of the Casamance River, taking into account soil, water and socioeconomic conditions (construction in any areas where this kind of work can be effective in increasing rice production, etc.) |
| Alternative V | Interventions planned in all river valleys of the Casamance River using only water retention dikes (no anti-salt dikes constructed) |

The PER recommended Alternative II, which specified conducting interventions only in areas with existing impoundments, such as roads, and earlier dams, thus minimizing impacts of the project-supported dikes. This alternative was adopted and was seen as the least restrictive to achieving the aims of the project, while still involving little or no new loss of habitat.

It was also found that certain sites in Programs I and II had been selected in areas that had not previously been blocked. In these areas, a mitigation program was recommended to make up for potential loss of aquatic habitat.

Following this analysis, the PER recommended an integrated research and monitoring program, that would respond to the environmental concerns raised, as well as provide the basic applied research called for in these two components. This program, described in the following section, became the basis for a Cooperative Agreement with the *Institute Scientific de Reserches Agricoles (ISRA)*. The program was designed to achieve the following:

- implement the recommended mitigation program,
- monitor additional environmental consequences that may not be foreseen and take measures to modify SZWMP to avoid any new effects (if any).
- carry out operational research activities in project valleys and the Affiniam Dam.

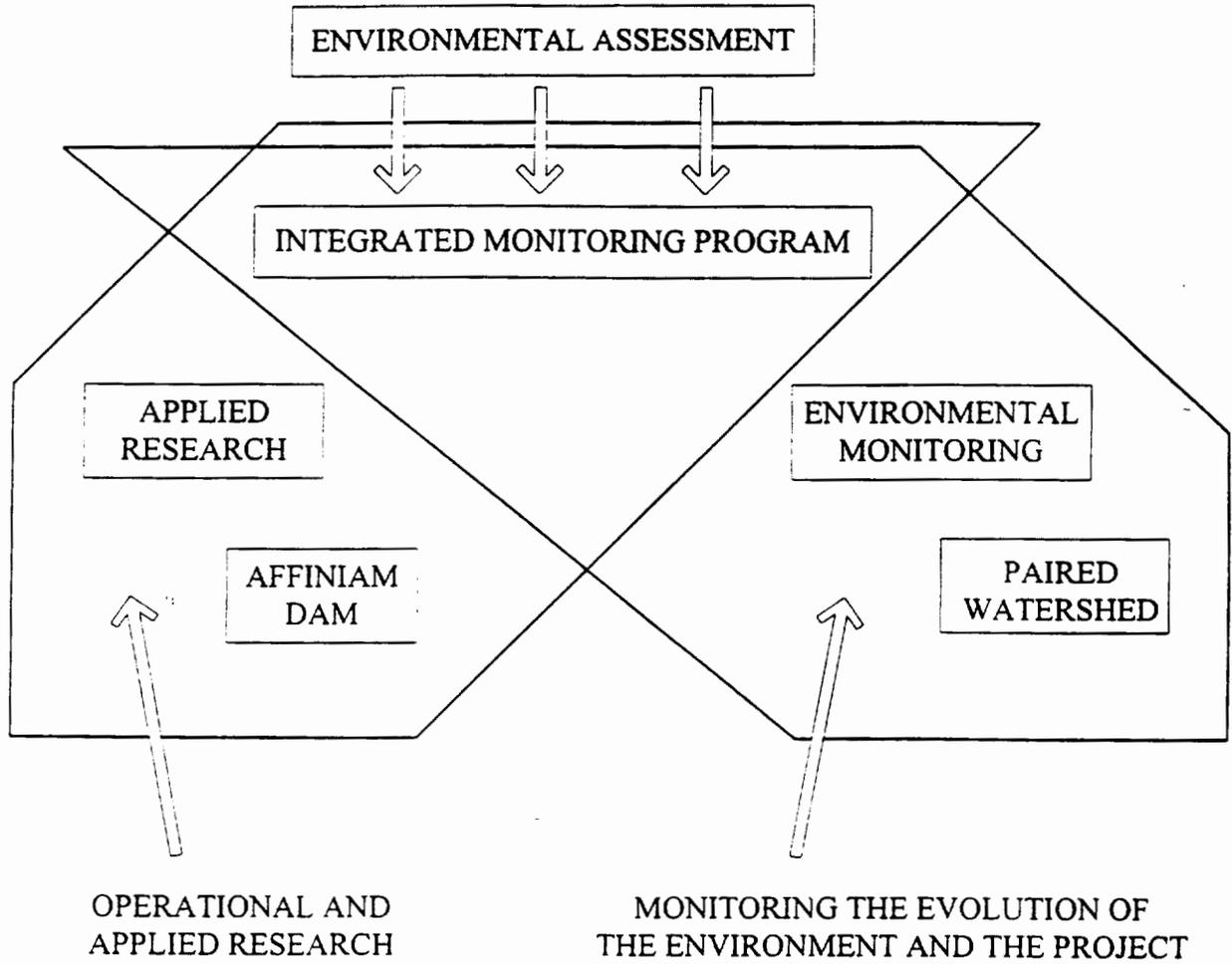
Figure 5.1 summarizes the relationship between the PER and the research and monitoring program envisioned for ISRA activity.

5.2 Operational and Applied Research/Environmental Mitigation and Monitoring -- Cooperative Agreement with ISRA

5.2.1 Objectives and Approach

Based on the concerns raised in the PER, a Cooperative Agreement for an integrated applied and environmental research, monitoring and mitigation program was developed and signed with ISA

FIGURE 5.1
RELATIONSHIP OF PER AND APPLIED RESEARCH



in August 1993. This program was structured around the following activities:

- Assessment of effects upstream and downstream of anti-salt and water retention dikes in five valleys:
 - Nguindir (Program I)
 - Badobar (Program II)
 - Balinghor (Program II)
 - Silinkine (Program III)
 - Birkama (Program IV)
- Pilot implementation of mitigation activities in Program I and II valleys
- Assessment of the Affiniam Dam based on secondary information obtained primarily through the Chinese program.

The ISRA program was divided into five research teams, representing the major disciplinary areas of investigation.

- Team 1: Soils and Vegetation
- Team 2: Agronomy/Production Systems
- Team 3: Hydrology
- Team 4: Fisheries
- Team 5: Consultants
 - Health
 - Ornithology

For each team, Standard Operating Procedures (SOPs) were established to carry out the field data collection and measurement. The SOPs specified sampling and measurement techniques and provided the basis for the work plan, levels of effort and budgets defined in the Cooperative Agreement.

5.2.2 Results

ISRA was substantially behind schedule in the submission of its various research reports. For the first year of operations, two major reports were due: Data Report and Annual Report. Neither was delivered as originally scheduled in August, 1994. Following several extensions in time, ISRA submitted the Annual Report on February 28, 1995. This was reviewed and comments provided on March 28, 1995. Following several meetings and direct assistance on how to provide a clearly formatted report, ISRA finally submitted an acceptable Annual Report in May, 1995. On June 14, 1995, ISRA submitted a draft final report for this phase of the project. After review, comment and repeated requests, ISRA submitted its last version of the Final Report in October 1995.

In general, ISRA was able to establish a good baseline for certain data, while providing little or no information on others. Based on the data gathered and preliminary analyses, the following conclusions can be drawn from the ISRA work:

Soils/Vegetation

These efforts established a solid database in soils and vegetation for the five valleys studied. The primary characteristic of most soils in the five valleys are of low pH (frequently less than 4) and moderate to high salinity (up to 50 mmhos/cm). Salinity regimes decrease during the rainy season. For instance at Nguindir salinities are as high as 50 mmhos/cm in May at the beginning of the rainy season and drop to less than 4 mmhos/cm in August at the height of the rains.

The collection of data for one season is not sufficient to answer major questions concerning effects of the interventions. However, they have begun to collect the information that can eventually address these questions through the database. There do not appear to be any major differences in soil characteristics in the intervention and control valleys. The long history of previous blockages to all of the valleys, and the presence today of the national highway in the control valley of Birkama, lead to the not unreasonable finding that the salinity and hydrology patterns for both the control valleys and the intervention valleys are similar.

The significance of this finding is that the environmental impacts of the new interventions (as viewed by soils data) might not be significantly greater than other previous or existing impacts in the valleys. This finding also suggests that the impacts of the interventions on agriculture may also be more subtle. Changes in agricultural production may have occurred on areas that were small compared to the total size of each valley. Therefore while production changes may be important, they have relatively low impacts on the total soil and hydrologic picture for each valley. ISRA production findings are presented below in the Agronomy/Sociology Section.

Sociology and Agronomy

The Annual and Final Reports document village structures and historical development for each valley. Some useful observations are made with respect to villagers' perception of the valley as an area for common use and membership in traditional and familial associations. Numbers and sizes of households are presented. Information is presented in terms of eco-geographical zones, but not with respect to the impacts of the dikes.

The dike operation study revealed a bipolarization in interest between the villagers based on 1) internal interest based on cultural interests, and 2) external interests based on their relationship to the water regimes for the new interventions. It is significant that the village water management committees (IVWMCs and VWMCs) have attempted to sort out the interests between the farmers with plots near the dikes, and those with plots further away.

The Annual and Final reports provide area and yield information for rice and non-rice crops. Based on the sample, diked valleys tend to show a higher rate of rice cultivation and a higher rate of rice under flooded conditions. Rice yields showed wide variation within and between valleys in the sample.

ISRA carried out three types of agronomic research: (i) evaluation of improved varieties and local trials; (ii) demonstration plots; and (iii) estimation of insect damage on rice production. Local trials concerned varieties under three conditions: mangrove rice (under salty conditions); lowland rice (non-salty conditions); and water table rice. Several varieties with promising results are identified.

Demonstration plots were established in six valleys. Additional tests on the impact of pesticides are also reported. A statistical analysis is carried out to assess the impact of insecticides. It was reported that, overall there was no statistical difference between treated and untreated fields, but that significant differences existed among the valleys, and that inundated rice tended to be more susceptible to attack than water table rice. No work, however, was done on the entomological impact of the dikes.

Because of its diverse nature, this portion of the program was the largest, most complex and difficult to focus on specific objectives.

Hydrology

The hydrology studies have provided carefully prepared survey maps for the five valleys over four time periods. As with the soil surveys, the lack of information over a limited time period prevented the team to compare salinities before and after interventions.

Fisheries and Mitigation

The objectives of the fisheries and mitigation studies were to document changes in fish abundance and variety due to the dike operations by conducting fish market surveys in each of the regions of the five valleys and to estimate changes in productivity of estuary and estimate of net gain/loss of biomass in valleys with dikes.

The mitigation programs got off to a slow start. However, ISRA included the innovation of a series of bamboo enclosures located in the areas and in areas of seasonal freshwater above the anti-salt dikes. The placement of enclosures at Badobar in an area between the anti-salt dike and the upstream freshwater retention dike appears to be a more cost-effective approach to fish mitigation than digging fish ponds. The enclosures are flooded constantly by water in the areas, allowing removal of harmful waste materials from the enclosures and maintenance of adequate oxygen and lower temperatures for the growing fish. The inconvenience of access to the ponds on plank bridges apparently is not a major concern to the villages. The structures appear to be

sturdy enough to withstand several seasons of operation and repair is with materials that are inexpensive. Fish appear to triple in weight during the four-month growing season.

Ornithology/Health

The objectives of the ornithology and human health studies were to document changes in bird species due to the presence of dike structures, as well as to document any effect due to pesticides and fertilizers used in the newly reclaimed areas. An additional objective was to assess changes in the incidence of malaria and schistosomiasis due to the present of additional aquatic habitats for insect disease vectors. These activities were to be carried out by outside consultants.

The avian survey revealed a large diversity of birds in all valleys, as well as the presence of the some species of storks and cormorants that are considered to be endangered in Senegal . A comparison between the numbers of species between the dikes valleys and the control valleys, reveals that there has been a reduction in bird species in the diked areas. No information has been provided on the effects of pesticides or fertilizers on birds.

No data was collected on human health.

Good secondary information was collected on the impacts of the Affiniam Dam on the Bignona River, reported in the final report.

All data collected by the program were contained in a collection of data bases. The data base was organized around a software program, PARADOX, designed to enter data. This system used was a standardized, computer-based information management system. The systems assured that the data would not be lost, gave some quality control to the data (by assuring that needed data were included and that the data appeared to fit into normal ranges). The data base has been transmitted on diskette.

5.3 Project Monitoring and Evaluation

5.3.1 Overview

One of the concerns voiced by the mid-term evaluation was the lack of viable data to assess the real impact of the project. Following on the evaluation's recommendations, an explicit Project Monitoring and Evaluation Unit was set up with the hiring of a local Social Scientist/Monitoring Specialist. The major outputs of this unit are to be:

- a Management Information System that permits the tracking of project activities and provides timely information for project management on activity levels, results and performance.

- Field Surveys that provide information on the impact of the project activities over time.

These two major activities are designed not only to report on activities accomplished through the life of the LBII contract, but to continue through the 18-month extension period, and hopefully beyond.

5.3.2 Management Information System

To provide timely and useful information on project activities and results, a Project Monitoring Data Base has been developed, utilizing PARADOX data base software. The data base has been developed in collaboration with a local computer firm for application in a user-friendly environment. The elements and structure of the data base are based on existing tables and monitoring systems previously developed over the life of the project. The output tables of the Data Base have also been developed and refined through iterative consultations with the project personnel, to ensure that the data base properly reflects the activities and provides information desired by the PMU managers.

Figure 5.2 summarizes the operational structure of the data base developed for this purpose. Information is stored and coded at the valley level, with some particular data (such as the data on composting) at the village level. Agricultural data on the demonstration plots are also cross-referenced with the hydro-ecological zones. The same valley and village codes are used for the Monitoring Data Base, as well as the results of the Impact Surveys, as explained below. Examples of the user-friendly input screens are shown in **Figure 5.3**.

5.3.3 Project Impact Monitoring

The project impact monitoring activities seek to provide information on the project's goals and purposes -- to increase cereals, mainly rice production, in the Ziguinchor and Kolda regions. In addition, USAID requested that monitoring activities also provide information into the mission's annual assessment of program impact (API). Two basic surveys were established to supply baseline and monitoring data in the project valleys:

- Household surveys in a sample of project valleys
- Production, area and yield surveys in all project valleys

Household Surveys

(I) Methodology

The first household survey was carried out through a contract with a local firm, SENECEI, in 1993. It involved a sample of three valleys from Program II. Early in the implementation, it became clear that the SENECEI team had limited knowledge and skill in carrying out such a survey. With assistance from the LBII short term Agricultural Economist, an effort was made to improve the questionnaires, sampling methodology and implementation. However, problems have remained in

FIGURE 5-2
MIS DATA BASE : OPERATIONAL STRUCTURE

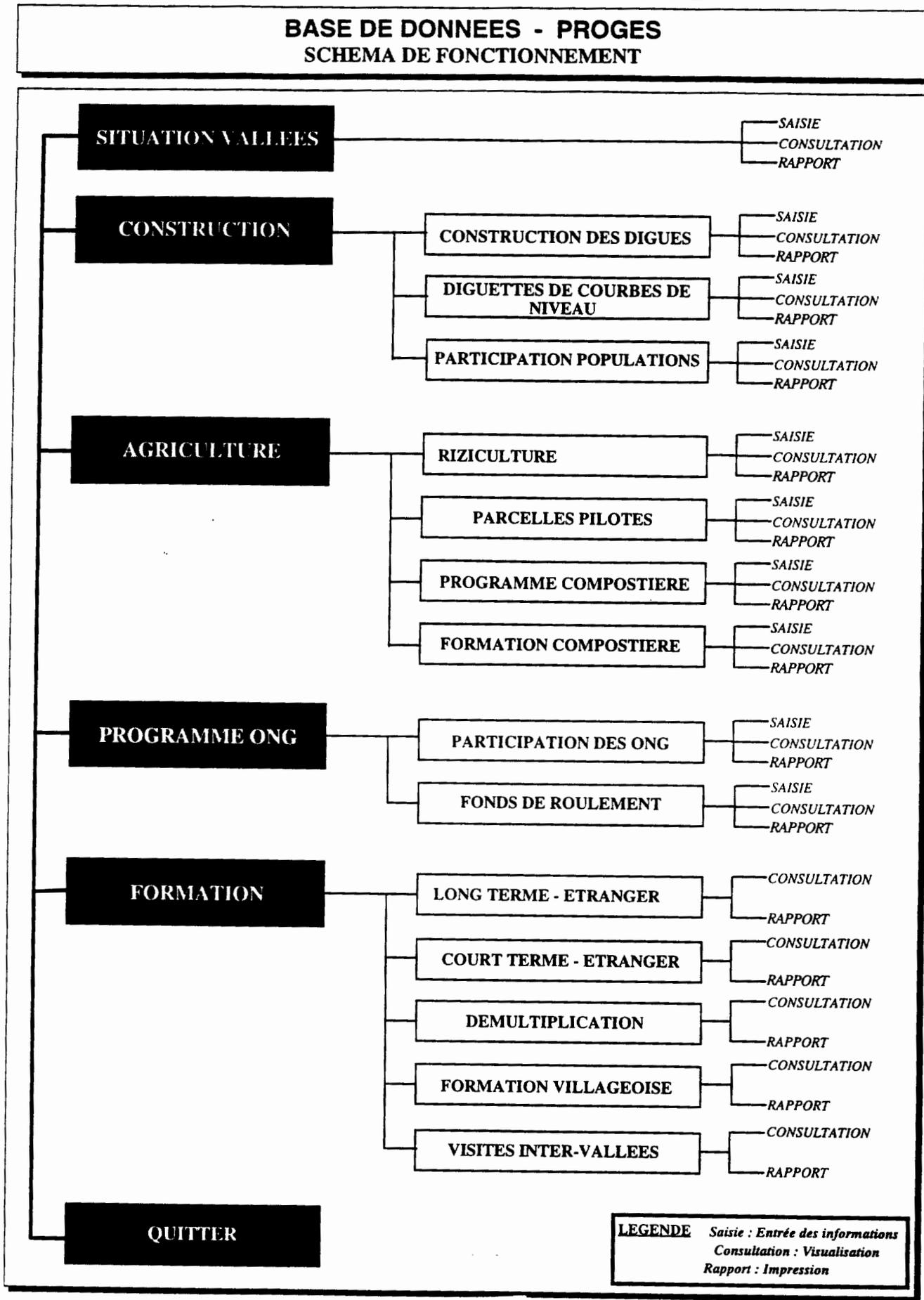


FIGURE 5-3
MIS DATA BASE : SAMPLE INPUT FORMATS

EXEMPLES DE FORMULAIRES (MASQUES DE SAISIE)

PROGRAMME COMPOSTIERE

| | | | | | |
|------------------|----|--------------|-------------|----------|------|
| Code vallée | 01 | Code Village | 01 | Année | 1995 |
| NOMBRE DE FOSSES | | Remplies | 125 | | |
| | | Mâtures | 100 | | |
| PRODUCTION | | Estimée | Stock Année | Utilisée | |
| | | | Précédente | | |
| | | 60000 | 15000 | 75000 | ◀ |

ECRAN DE SAISIE
PROGRAMME
COMPOSTIERE

3.1 RIZICULTURE - ENQUETES IRA

| | Vallée | Année | Zone |
|-------------|------------|--------------|-------------|
| | Riz Inondé | Riz de nappe | Riz pluvial |
| SUPERFICIES | | | |
| RENDEMENTS | | | |
| PRODUCTIONS | | | |

ECRAN DE SAISIE
RIZICULTURE
(ENQUETES IRA)

the application of appropriate weights assigned to fields in the sample, which has brought into question the validity of the results.

Although the results of the SENECEI survey were disappointing, the survey provided a basis to design a broader household survey that covered a larger sample of fourteen valleys (eleven valleys in the SZWM Program and three control valleys). The revised survey adapted the questionnaires from the SENECEI survey and stratified the sample into the three agro-hydrological zones adopted in the ISRA study:

- **Nguindir Zone**, adjacent to the Casamance River (primary source)
Nguindir, Badobar , Segafoula , Birkama. Control: Bambaly
- **Mayor Zone**, adjacent to the Soungrougrou River (secondary source)
Mayor, Kandion Mangana, Talito, Bounkiling. Control: Marakissa
- **Bignona Zone**, adjacent to tertiary rivers: Bignona, Baila or Diouloulou (tertiary source)
Balinghor, Djinaki, Diegoune. Control: Tendouk

The sampled valleys were also initially stratified according to the year in which the demonstration plots were established. This gave a 4 x 3 matrix of twelve strata. Household rice production data was collected only on a smaller, intensive sample of households. Finally, this method of cross-sectional sampling enables us to look at project impact “with” versus “without” in the same year, thus controlling for inter-annual variations in rainfall.

The first analyses of the data revealed that a more important factor in viewing impact would be whether or not the valleys had water control. The method of establishing data sets by valley, enabled us to regroup the valleys into a 2 x 3 matrix that showed results for valleys **with water control** and **without water control**, for each the three agro-hydrological zones. The revised household survey was carried out using this methodology for the 1994/95 production season.

The 1995/96 survey is currently in process and will continue into the 18-month extension period. It builds on the results and lessons learned from the previous surveys. In particular, the sample has been stratified into a 3 x 3 matrix, according to the three agro-hydrological zones and whether they have: more than 2 years of water management; less than two years of water management; and a control of no water management. Additionally, there will be no separate intensive sample; rather, production information will be collected for all households 540 households (9 valleys x 60 households per valley), thus providing a much larger sample on household areas and production.

Finally, the 1995/96 survey includes an additional questionnaire to supply information on Natural Resource Management, as indicated in the mission’s API indicators.

(ii) Initial Results

Initial results of the 1994/95 Household Survey essentially show that statistically significant impacts of water control have not yet occurred, and that results are uneven among the three agro-hydrological zones. However, as zones are combined and the sample size increases, the results begin to show a positive direction of impacts of water control for certain variables. This survey has now provided a sound basis for continued surveys over the 1995/96 and 1996/97 seasons, which should begin to show more clearly the impacts of the program. The results of several key variables are shown in **Figure 5.4** and are briefly discussed below:

Cultivated Rice areas per household

For all zones combined, rice areas were 1.34 hectares with water control vs. 1.14 hectares without water control. However, this is heavily weighted by significantly larger areas per household with water control in the Bignona zone. Areas per household were higher in the other two zones. One explanation could be that less water control would lead to more extensive cultivation practices.

Non-Cultivated and Abandoned Rice Fields

Households with water control reported less of their rice fields as abandoned (68%) than households without water control (75%). Of further significance, households without water control attributed a larger percentage of abandonment to salt and water deficit problems (58% and 37%, respectively) than households with water control (52% and 21%, respectively). Thus, although still a serious problem, salt and water deficit may be perceived as becoming somewhat less serious in valleys experiencing water control.

Household Rice Production

As the 1994/95 survey was carried out after the harvest, rice production was estimated based on an extrapolation of the household's estimate of charity (*dime*), which represents 1/10 of production. Although this is a somewhat crude measure, households with water control showed a slightly higher level of production (684 kg./household) than for households without water control (538 kg./household).

The 1995/96 survey will systematically measure areas and production on the entire sample and thus will provide improved data on household area, yield and production.

Utilization of Improved Inputs

Overall, fertilizer usage is very limited. A higher percentage of fields use NPK in valleys with water control (7.9%) than without water control (4.6%), as with phytosanitary products (3.9% with vs. 2.1% without). The application of urea is about the same (5.2% with vs. 5.0% without).

FIGURE 5-4

SELECTED SUMMARY TABLES FROM HOUSEHOLD SURVEY

A-Superficie moyenne cultivée par ménage en 1994/1995 en ha

| | | ZONE | | | |
|------------------------------------|----|----------|-------|---------|-------------------------|
| | | NGUINDIR | MAYOR | BIGNONA | TOUTES ZONES CONFONDUES |
| Vallées avec une maîtrise de l'eau | s | 0,73 | 1,09 | 2,98 | 1,34 |
| | n | 16 | 41 | 12 | 69 |
| | sx | 0,61 | 0,74 | 1,56 | 1,18 |
| Vallée sans maîtrise de l'eau | s | 1,09 | 1,24 | 1,14 | 1,14 |
| | n | 46 | 27 | 29 | 102 |
| | sx | 0,94 | 1,35 | 0,87 | 1,04 |

B-Cause des abandons des parcelles de riz au niveau des ménages en % en 1994

| | ZONE | | | | | | | | | | | |
|---------------------------------|-----------|------------|--------|-----------|------------|--------|-----------|------------|--------|--------------|------------|--------|
| | NGUINDIR | | | MAYOR | | | BIGNONA | | | TOUTES ZONES | | |
| | salini té | manq d'eau | autres | salini té | manq d'eau | autres | salini té | manq d'eau | autres | salini té | manq d'eau | autres |
| Vallées avec une maîtrise d'eau | 40.7 | 29.4 | 23.5 | 46.3 | 14.8 | 38.9 | 68.1 | 31.9 | 0 | 52.3 | 20.9 | 26.7 |
| Vallées sans maîtrise d'eau | 87 | 1.9 | 11.9 | 98 | 0 | 2 | 14.3 | 80.7 | 5 | 58 | 37.1 | 3.8 |

C-Estimation des productions moyennes en kg par ménage en 1994

| | ZONE | | | |
|---------------------------------|----------|--------|---------|------------------|
| | NGUINDIR | MAYOR | BIGNONA | MOYENNE GENERALE |
| Vallées avec une maîtrise d'eau | 700.38 | 537.04 | 1164.01 | 683.95 |
| Vallées sans maîtrise d'eau | 477 | 572.36 | 603.17 | 538.11 |

FIGURE 5-4 (CONT.)

D-Utilisation des intrants en % dans les parcelles de riz en 1994

| | ZONE | | | | | | | | | | | | | | | |
|------------------------------------|----------|---------|----------|-----------|--------|---------|----------|-----------|---------|---------|----------|-----------|--------------|-----|----------|-------|
| | NGUINDIR | | | | MAYOR | | | | BIGNONA | | | | TOUTES ZONES | | | |
| | fumier | NP K | UR EE | Pro. P | fumier | NP K | UR EE | Pro. P | fumier | NP K | UR EE | Pro. P | fumier | NPK | URE E | Pro.P |
| Vallées avec maîtrise d'eau | 71.9 | 21.6 | 19.4 | 0.4 | 64.2 | 5.5 | 2.5 | 5.8 | 18 | 1.9 | 0 | 0 | 58.3 | 7.9 | 5.2 | 3.9 |
| Vallées sans maîtrise d'eau | 64 | 7.4 | 8.2 | 4.1 | 57.2 | 4.5 | 4.5 | 0.9 | 59.4 | 0.6 | 0.6 | 0.2 | 60.9 | 4.6 | 5.0 | 2.1 |

E-Pourcentage du riz par rapport aux autres cultures en 1994

| | ZONE | | | | | |
|------------------------------------|----------|------------------|-------|------------------|---------|------------------|
| | NGUINDIR | | MAYOR | | BIGNONA | |
| | Riz | autre que le riz | Riz | autre que le riz | Riz | autre que le riz |
| Vallées avec maîtrise d'eau | 28.5 | 71.5 | 36.7 | 63.3 | 50.3 | 49.7 |
| Vallées sans maîtrise d'eau | 39.9 | 60.1 | 40.4 | 59.6 | 54.1 | 45.9 |

When the question was asked, "Would you be willing to barter two kilos of rice for kilo of fertilizer?" The response was about 75% agreed; 20% not agreed; and 5% no opinion. This indicates a general comprehension of the value of fertilizer.

Commercialization of Rice

The survey showed that virtually none of the household rice produced is sold. This is to be expected in these early years, and may change as rice production increases, and the committees become more active in income-generating activities.

Rice vs. Non-Rice Areas

At the household level, rice competes with other crops for resources and land. The 1994/95 survey showed that households with and without water control have about the same percentage of land in rice and non-rice lands. It will be of interest in the coming years to see if and by how much this percentage changes, as the full impacts of water management take hold.

General Conclusion

As with the ISRA studies, it is too early to discern clear impacts of the introduction of improved water control. It should be noted that during the 1994/95 season, only seven valleys had effective water control, and of these, only two had more than one year. Starting in 1995/96 season, there are 20 valleys with full water control (Badobar and Kounounding Dioe can be considered as having partial water control). The 1994/95 survey will provide a strong baseline for assessing impacts over the next two years.

It should be kept in mind, however, that major development impacts of agricultural development programs generally occur over a five to ten-year period. The major indicator that we have at this time is the enthusiastic response of the farmers, who have seen, especially in the 1995/96 season, that water is being controlled in a relatively large number of valleys. As a result, they are already taking the initiative to attempt soil recovery in certain areas.

Regional Inspectorate Production Surveys

In 1993/94 season surveys for rice area, yield and production were carried out through the Regional Inspectorates of Agriculture (IRAs) in three valleys. This was an effort to test the methodology for carrying out these surveys. In the 1994/95 season, a more complete survey was carried out for twenty-six valleys originally planned in the SZWMP program. The results of this survey were published by the IRAs in April 1995, with revisions completed in June 1995. The results are presented by Agro-hydrological zones, in order to be consistent with the household and ISRA survey approaches.

As with the Household Survey, these surveys will be continued in future seasons to provide a basis for comparing rice production results in the program's valleys, according to agro-hydrological zone and years of water management operation.

6. RECOMMENDATIONS AND FUTURE ACTIVITIES

6.1 Eighteen-Month Work Plan

During the July-December 1995 extension period, the team assisted the Project Director in drafting Eighteen- Month Work Plan, January 1996 - June 1997. This period will be directly managed by the PMU under the Project Director, with joint inputs from USAID and GOS. The Plan presents activities by major component and a budget that corresponds to those components. The Training/NGO Coordinator and Social Scientist provided direct input in terms of activities, schedules and estimated costs.

The 18-month work plan has the following major components:

1. Completion of Dike Construction
2. Secondary Works, notably contour berms and soil conservation measures
3. Agricultural Development Activities (*Mis en Valeur*)
4. Training
5. Monitoring and Evaluation

A major thrust of the program is on training and institution-building in order to build sustainable capacities at the local and government and non-government support levels. The draft Plan is to be submitted to USAID and GOS in December, 1995.

6.2 Construction

Two structures were not completed as of July 1995. These involved the gated portion of the anti-salt dike at Badobar and the anti-salt dike at Kounounding Dioe. At that time, it was decided to terminate these contracts and that the PMU, in collaboration with USAID, would manage the completion of these works in 1996.

As of December 14, 1995, small finishing works were not completed by two contractors: Nader Dagher in the valleys of Samine Escale (109), Silinkine (112) and Badobar (122); and EBIS in the valleys of Toniataba (75) and Bougnadou (121). In both cases, the final settlement of these contracts included an agreement to complete the work. In the case of Dagher, the life of the bank guarantee was extended through May 1996 and the amount reduced to correspond to the scale of the work. For EBIS, retention money was not fully reimbursed in the final settlement. Upon certified completion of work certified by the PMU, USAID will return the guarantee to Dagher and the retained amounts to EBIS. Should the contractors default, the guarantee and retention amounts should be sufficient to complete the works.

One contractor, Dini-Setrap, has made a claim for additional costs incurred in the valley of Kounounding Dioe (21, 22, 24). At the time of this writing, a final settlement is being discussed, in conjunction with USAID.

6.3 Extension and Training

6.3.1 Areas Directly Influenced by the Dikes

The 18-Month Work Plan sets out annual targets for land development in the 22 valleys. The next step is to pursue individualized extension in each valley, in collaboration with the IVWMCs and the NGOs. In support of this, the first phase has established a sound basis for developing individual development programs, namely:

- The *Avant Projet Sommaire*, which provides details on soil, hydrological and topographic conditions and potentials.
- Technical packages developed through the demonstration plots
- Water Management Manuals

The SZWMP extension personnel should make maximum use of these and other phase 1 technical documents to work directly with the farmers to begin the process of land reclamation in the case of acid and salty soils; and improve production techniques on water deficit soils. By focusing on specific soils in relation to the dikes, the project will increase its possibilities to have a significant impact on rice production.

This concept may be operationalized through a series of meetings in each valley at the end of the 1995/96 season, to evaluate this year's application of the water manual, determine areas of improvement and plan for water management over the next 12 months.

6.3.2 Water-Deficit Areas

We strongly support the PMU's program to vigorously pursue contour berms and anti-erosive measures in the areas not directly influenced by the dikes. Construction of these structures will be at a lower cost per hectare than the dikes, but should again increase the project's chances of having an important impact on rice production. These structures will also serve to protect the dike investments by slowing runoff, particularly in valleys with steep side slopes.

While constructed at a lower cost, the project also found that properly constructed contour berms require detailed planning and particular attention to the materials used, in order to ensure their durability. Therefore, we recommend continued funding of these structures. In relation to the project's overall cost, this will be a worthwhile investment to maximize overall impact.

6.4 Monitoring, Evaluation and Research

The project monitoring and evaluation unit will have several major components for monitoring project activities:

- management information system
- household surveys on a sample of farms and valleys
- rice production census in all 22 valleys implemented by Regional Inspectorates of Agriculture
- environmental monitoring and mitigation

6.4.1 Management Information System

The data base for the management information system was designed to focus on the stated needs of the project's technical personnel. It was able to be developed in a very short period of time largely because we limited ourselves to specific outputs desired by the technicians.

The data base can also be viewed as useful provider of information that may change over time, as activities change. However, there is always a danger to collect too much data for its own sake. Therefore, future changes or additions to the data base should be made with the final output tables in mind, as well as the process of getting from basic data to those tables.

It should also be noted that the data from the household surveys are being stored in the same PARADOX software, using the same codes for valleys and villages.

6.4.2 Household Survey

The household surveys have accomplished about 1/3 of the households as of November 30. An initial input of the data into the computer has shown only a few problems. A *journee de reflection* has been carried out with the enumerators, supervisors and data management expert to assess progress and plan for the next phase.

Assuming the field work restarts in early January 1996, data collection should be completed by end of February 1996. Data entry will continue throughout this period, as we will have much more data on production than last year. Analysis and reporting of results could be completed by the end of March 1996. This will be advantageous in planning for extension activities in the 1996/97 season.

Planning for the 1996/97 survey should begin as soon as possible after the completion of the analysis of the previous year's data. Ideally, the field surveys should start in July-August, so as to avoid the time pressure at the end of the calendar year for measuring harvests. A **Methodology Manual** has been developed by Dr. Tom Zalla for the household and IRA surveys.

Complementary to the household survey is the thesis research work on the effectiveness of the extension programs being carried out by Mr. Sagna at Louisiana State University. Mr. Sagna will complete his program in May 1996.

6.4.3 Rice Production Census (*IRA* Survey)

In theory, a production census of this sort should be carried out every few years. However, given the project's time frame, it will be advisable to carry out another census for the 1996/97 season, then decide how often the PMU wishes to carry it out in the future.

The *IRA* survey information should be used in planning and evaluating the extension work noted above, since it provides area and yield information that can be related to specific zones of influence of the dikes.

6.4.4 Environmental Monitoring and Mitigation

The Final Report on Environmental Monitoring and Mitigation recommends continuing the research on soils, hydrology, and fisheries. Priority should be given to the fisheries efforts, because of the legal requirements for mitigation. Soils studies would have the second greatest priority because of its need to complement other aspects of the ongoing program. Finally, hydrology studies would provide a useful in-depth aspect of studies on a few valleys, as opposed to the SZWMP studies that will address limited sampling in many valleys.

Fisheries Research and Fish Mitigation

There are two options presented to USAID in the area of fisheries research and fish mitigation. In the first option, USAID will use the results of the pilot fish mitigation programs of ISRA and extend them to the full mitigation program in all six affected valleys. This option assumes the worst-case scenario for the maximum loss of aquatic habitat. In the second option, USAID may pursue a program of fisheries research and pilot program on fish mitigation. In this option, USAID will conduct research to assess the loss of aquatic habitat. This research would be used to define the size of the mitigation program, which may be lower than the worst-case scenario.

Soils

A second set of research effort includes the soils survey. The objective is to test the hypothesis that there is the possibility of saline intrusion into soils by leakage or hydraulic pressure around the dikes. Alternatively, there is the hypothesis that the dike operations do not improve the salinity profile in deeper soils, or do not represent a permanent improvement.

Complementary to this effort would be a one-time monitoring soil survey in a sample of valleys where baseline soil surveys were carried out in the *Avant Projet Sommaires*, thus observing the differences in soil salinity and acidity as the result of water management.

Also important in this domain is the research being carried out by Mr. Coly at Louisiana State University, which focuses on the management of saline and acid sulfate soils. Mr. Coly will complete his program in May 1996.

Hydrology

The third set of research efforts includes the hydrology survey. The objective of this research is to document changes in salinity and pH of the surface and groundwater hydrology due to the presence of dikes in the intervention valleys. This effort is at least partially covered by the Hydraulic Survey currently be carried out by the Regional Inspectorates of Hydraulics, in connection with the Water Management Manual implementation. In fact, this hydrological monitoring exercise will serve as:

- A tool for the carrying out the operation of the dikes according to the Water Management Manual guidelines.
- A data base which can be exploited to gain a better understanding of the hydrological characteristics of the area. For example, the calculation of runoff coefficients for surface water; and changes in groundwater levels in relation to water table rice cultivation.

Also important in this domain is the research being carried out by Mr. Thiam at Louisiana State University, which will provide useful information on the control of fresh and salt waters and their interaction are main factors in the development of small watersheds. Mr. Thiam will complete his program in December 1996.

7. PROJECT FINANCE AND ADMINISTRATION

7.1 Local Employees

All the employee labor contracts terminate on December 14, 1995. A Notice of Termination letter was sent to each employee (covered by a Indefinite or Definite Period Type Contract) one month prior to the termination date in observance of Senegalese labor law. And as required for two employees (the accountant and administrative assistant), the Notice of Termination letters were sent three months prior to the termination.

In completing service with LBII, each employee will receive an Employment Certificate and a final severance payment as required by law. The Labor Inspector of Ziguinchor has approved the final severance payment format to be issued by LBII.

| Fonction | Prénoms et Nom | Date de recrutement | Lieu d'affectation |
|-----------------------------|-----------------------|----------------------------|---------------------------|
| Assistant administratif | Keba Cissoko | 1 fév 92 | Siege PROGES |
| Comptable | Issa Gueye | 11 nov 90 | " |
| Secrétaire | Elisabeth Prieria | 1 fev 94 | " |
| Superviseur du parc auto | Maurice Bougazelli | 1 sep 92 | " |
| Chauffeurs | Omer Badji | 1 nov 90 | " |
| | Charles Badji | 1 jun 92 | " |
| | Sega Dicko | 1 mar 93 | " |
| | Jaques Dieme | 1 mar 93 | " |
| | Victor Sagna | 1 nov 90 | " |
| | Mamadou Sonko | 1 nov 90 | " |
| | Falilou Sow | 1 nov 90 | " |
| | Sidy Tendeng | 1 nov 90 | " |
| | Seydina Thiam | 1 nov 90 | " |
| Garcon de Bureau | Boubacar. Diallo | 15 jan 92 | " |
| Concierge | Baraya Gueye | 1 nov 90 | " |
| Local LBII Engineer | Alpha Diedhiou | July 95 | " |
| Local LBII Social Scientist | M. L. Bocoum | Oct. 94 | " |

7.2 Vehicle Park

The Project currently has a vehicle park of 18 vehicles, 2 tractors, 2 mobylettes, and 17 motorcycles. All vehicles are operational except one motorcycle. Insurance covers all vehicles through December 1995 except for the four new Nissan Patrol vehicles which are insured through August 1996.

7.2.1 Vehicle Park Status

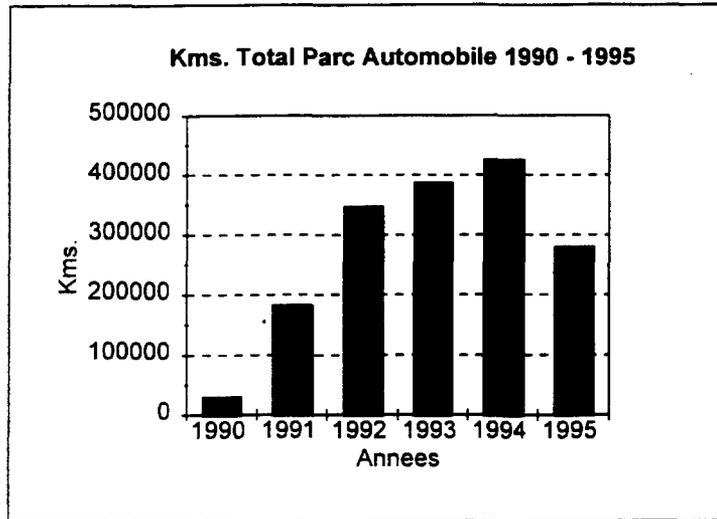
The table below provides a review of the active vehicle park of the project. There are four vehicles that have been removed and therefore do not appear in the table: 2 Toyota pickups and 2 Mitsubishi Pajeros. All four are parked (also uninsured) pending the eventual transfer to the GOS.

In general the park is in good condition. However, the vehicles put into service in 1990, while in fair condition, should be either sold or transferred to the government in 1996 for uneconomical reasons as all will have at least 200,000 kilometres registered.

| No. | Vehicle No | Type | Year in Service | Condition |
|-----|------------|------------------------|-----------------|-----------|
| 1 | 9897 TTB1 | Nissan Pickup | 24/9/95 | New |
| 2 | 9898 TTB1 | Nissan Pickup | 24/9/95 | New |
| 3 | 9899 TTB1 | Nissan Patrol | 24/9/95 | New |
| 4 | 9900 TTB1 | Nissan Patrol | 24/9/95 | New |
| 5 | 6796 TTB1 | Mitsubishi Pajero | 12/9/90 | Fair |
| 6 | 6797 TTB1 | Mitsubishi Pajero | 12/9/90 | Fair |
| 7 | 6799 TTB1 | Mitsubishi Pajero | 12/9/90 | Fair |
| 8 | 6800 TTB1 | Mitsubishi L200 Pickup | 12/9/90 | Fair |
| 9 | 6801 TTB1 | Mitsubishi L200 Pickup | 12/9/90 | Fair |
| 10 | 6802 TTB1 | Mitsubishi L200 Pickup | 12/9/90 | Fair |
| 11 | 9128 TTB1 | Toyota Pickup | 30/3/94 | Fair |
| 12 | 9344 TTB1 | Toyota Pickup | 30/8/94 | Excellent |
| 13 | 9345 TTB1 | Toyota Pickup | 30/8/94 | Excellent |
| 14 | 9452 TTB1 | Toyota Pickup | 30/6/95 | New |

7.2.2 Kilometers

Below is a graph that provides the total kilometrage for the vehicle park from June 1990 - August 1995 and an accompanying table that shows kilometers by vehicle and year. The Nissan vehicles received in August and related kilometers are not included in either table.



**LBII Vehicle Park Kilometer Table for
1990 - 1995**

| No. | Vehicles | Mark | Entry Date of Service | | | | | | | Total |
|-----|-----------|------------|-----------------------------|---------------|----------------|----------------|----------------|----------------|----------------|------------------|
| | | | | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | |
| 1 | 5726 TTB1 | Toyota | 25/5/89 | 2,125 | 12,258 | 31,561 | 35,739 | 26,931 | 3,795 | 112,409 |
| 2 | 5727 TTB1 | Toyota | 25/5/89 | 1,968 | 11,627 | 27,983 | 33,423 | 26,865 | 1,956 | 103,822 |
| 3 | 6795 TTB1 | Mitsubishi | 12/9/90 | 4,798 | 24,022 | 41,230 | 51,702 | 37,069 | 16,894 | 175,715 |
| 4 | 6796 TTB1 | Mitsubishi | 12/9/90 | 8,149 | 21,843 | 39,218 | 39,523 | 38,407 | 23,804 | 170,944 |
| 5 | 6797 TTB1 | Mitsubishi | 12/9/90 | | 0 | 6,992 | 35,202 | 44,456 | 26,273 | 112,923 |
| 6 | 6798 TTB1 | Mitsubishi | 12/9/90 | 3,682 | 22,213 | 45,487 | 51,496 | 40,510 | 23,855 | 187,243 |
| 7 | 6799 TTB1 | Mitsubishi | 12/9/90 | 5,719 | 25,707 | 41,085 | 4,430 | 36,138 | 22,282 | 135,361 |
| 8 | 6800 TTB1 | Mitsubishi | 12/9/90 | 0 | 23,548 | 35,805 | 54,806 | 45,747 | 26,572 | 186,478 |
| 9 | 6801 TTB1 | Mitsubishi | 12/9/90 | 0 | 19,877 | 41,024 | 29,513 | 38,303 | 31,589 | 160,306 |
| 10 | 6802 TTB1 | Mitsubishi | 12/9/90 | 3,415 | 22,584 | 36,995 | 51,463 | 36,251 | 23,551 | 174,259 |
| 11 | 9128 TTB1 | Toyota | 1/3/94 | 0 | 0 | 0 | 0 | 32,566 | 8,575 | 41,141 |
| 12 | 9344 TTB1 | Toyota | 30/8/94 | | | | | 11,768 | 36,754 | 48,522 |
| 13 | 9345 TTB1 | Toyota | 30/8/94 | | | | | 10,973 | 34,635 | 45,608 |
| | | | Total | 29,856 | 183,679 | 347,380 | 387,297 | 425,984 | 280,535 | 1,654,731 |

7.3 Commodities

During the life of the contract, LBII procured or received commodities either through direct procurement either locally or off-shore, or from transfers of commodities from other USAID projects. The inventory list is attached in Annex 2 and the exoneration list is attached in Annex 3.

7.4 Contract Funding

The original contract estimated cost was established at \$8,836,260 US and it was increased by increments during the five years to \$14,916,000 US.

7.4.1 Expenditures by Year

The table below provides a review of expenditures by year under the contract. For 1995, the expenditures include actual expenditures through October and estimated expenditures for November and December 1995¹.

| Category | Contract Budget | 1990 Expend. | 1991 Expend. | 1992 Expend. | 1993 Expend. | 1994 Expend. | 1995 Expend. | Solde Budgetaire |
|------------------------------------|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|
| Salaries and Wages | 1,979,349 | 81,294 | 307,746 | 377,277 | 490,202 | 389,850 | 329,070 | 3,910 |
| Fringe Benefits | 503,691 | 22,878 | 77,925 | 95,809 | 135,563 | 95,416 | 73,177 | 2,922 |
| Overhead | 1,709,552 | 76,757 | 198,608 | 315,288 | 443,327 | 327,254 | 343,783 | 4,535 |
| Travel, Transport, and Per Diem | 1,062,730 | 50,270 | 162,303 | 281,218 | 268,165 | 150,957 | 142,482 | 7,334 |
| Allowances | 893,579 | 42,857 | 192,774 | 195,201 | 257,716 | 145,631 | 77,512 | (18,112) |
| Expendable Supplies | 537,295 | 9,940 | 68,253 | 147,189 | 162,615 | 98,761 | 58,141 | (7,604) |
| Non-Expend. Supplies | 416,091 | 2,011 | 33,336 | 69,618 | 149,144 | 109,599 | 48,268 | 4,114 |
| Participant Training | 570,160 | 0 | 1,802 | 10,230 | 82,059 | 214,183 | 211,471 | 50,415 |
| Construction/Devel. Infrastructure | 4,548,986 | 0 | 1,966 | 510,523 | 1,103,679 | 938,581 | 1,971,235 | 23,002 |
| Research & Monitoring | 555,578 | 0 | 1,243 | 52,456 | 51,976 | 241,430 | 181,135 | 27,338 |
| NGO | 222,995 | 0 | 0 | 0 | 0 | 132,622 | 82,720 | 7,653 |
| Other Direct Costs | 1,267,998 | 26,140 | 130,887 | 264,007 | 345,275 | 211,114 | 297,971 | (7,395) |
| G and A | 169,078 | 3,347 | 47,848 | 36,087 | 39,441 | 33,586 | 18,390 | (9,621) |
| Total | 14,437,082 | 315,494 | 1,224,691 | 2,354,903 | 3,529,163 | 3,088,985 | 3,835,355 | 88,491 |
| Fixed Fee | 478,918 | 10,948 | 42,497 | 81,715 | 127,573 | 105,861 | 110,324 | (0) |
| Total Cost | 14,916,000 | 326,442 | 1,267,188 | 2,436,618 | 3,656,736 | 3,194,846 | 3,945,679 | 88,491 |

1/ To be revised pending final invoice.

7.4.2 List of Modifications

There were twelve contract modifications of which several were administrative and the remainder added additional funding to the contract. These are summarized in the table at the end of this section.

7.5 Contracts

During this contract, LBII signed 107 contracts for construction and related technical services and service contracts. There were 59 construction contract and the remaining ones were service contracts. The table below presents a listing of contracts by year: note that there were no contracts issued starting with #0030 through #0049.

Summary List of Contracts

| Contract # | Contract Amount | Contractor | Contract Type | Program | Valleys |
|-------------------|------------------------|-------------------|------------------------|----------------|----------------|
| 1/92 | 12,927,354 | EBTP | Construction | 1 | Mayor/2 |
| 2 | 15,480,947 | EBTP | Construction | 1 | Mayor/3 |
| 3 | 43,411,062 | Dagher | Construction | 1 | Nguindir/1 |
| 4 | 15,769,465 | CTS | Construction | 1 | Nguindir/3 |
| 5 | 19,053,502 | Dagher | Construction | 1 | Nguindir/4 |
| 6 | 12,174,000 | Senagrosol | Map Study | 1 | |
| 7 | 6,434,400 | Galaxis | Topographical Services | 1 | |
| 8 | 9,303,200 | Cereeq | Geotechnical Work | 1 | |
| 9 | 21,075,000 | Bouette | Topographical Services | 1 | |
| 10 | 4,676,938 | Cereeq | Geotechnical Work | 1 | |
| 11/93 | 6,478,385 | EBTP | Construction | 2 | Mayor/1 |

| | | | | | |
|---------|------------|---------------|----------------------------|---|---------------|
| 12 | 7,636,325 | EBTP | Construction | 2 | Mayor/4 |
| 13 | 30,299,757 | Dagher | Construction | 2 | Nguindir/2 |
| 14 | 16,347,953 | Bagnere | Construction | 2 | Kandion M./1 |
| 15 | 19,013,015 | Baghere | Construction | 2 | Kandion M./2 |
| 16 | 13,752,217 | Dagher | Construction | 2 | Kandion M./3 |
| 17 | 11,289,786 | Dagher | Construction | 2 | Kandion M./4 |
| 18 | 6,896,025 | Dagher | Construction | 2 | Kandion M./5 |
| 19 | 8,404,431 | Dagher | Construction | 2 | Kandion M./6 |
| 20 | 29,550,362 | Fudalu | Construction | 2 | K. Djoe/1 |
| 21 | 34,274,338 | Dini-Setrap | Construction | 2 | K. Djoe/2 |
| 22 | 11,197,483 | Dini-Setrap | Construction | 2 | K. Djoe/3 |
| 23 | 5,741,841 | CET/EBTP | Construction | 2 | K. Djoe/4 |
| 24 | 1,755,192 | Dini-Setrap | Construction | 2 | K. Djoe/5 |
| 25 | 67,632,617 | GTA | Construction | 2 | Badobar/1 |
| 26 | 11,583,050 | GTA | Construction | 2 | Badobar/2 |
| 27 | 21,208,808 | GTA | Construction | 2 | Badobar/3 |
| 28 | 17,771,310 | GTA | Construction | 2 | Badobar/4 |
| 29 | 7,601,600 | GTA | Construction | 2 | Badobar/5 |
| 30 - 49 | | | Contracts never issued | | |
| 50 | 1,460,000 | Senagrosol | Ariel Study Interpretation | 2 | |
| 51 | 5,249,250 | Seneci | Agro-Econ. Study | 2 | |
| 52 | 4,008,804 | Cereeq | Geotechnical Services | 2 | |
| 53 | 9,679,310 | Setico | Sondage-Prog. III | 2 | |
| 54 | 5,294,512 | Arezki | Sondage-Prog. II | 2 | |
| 55 | 3,330,000 | Sud Info. | Computer Training | 2 | |
| 56 | 1,854,000 | Setico | Topography Services | 2 | |
| 57/94 | 2,520,000 | Senagrosol | Soil Study Prog. III | 3 | |
| 58 | 16,021,596 | Fady & Louty | Guard Services | | |
| 59 | 750,000 | Seye | Topography Services | 3 | |
| 60 | 26,279,170 | Dagher | Construction | 3 | Diatang/1 |
| 61 | 30,179,550 | Dagher | Construction | 3 | Diatang/2 |
| 62 | 4,008,804 | Cereeq | Geotechnical Services | 3 | |
| 63 | 39,814,525 | Arezki | Construction | 3 | Balinghor/1T |
| 64 | 21,235,641 | Arezki | Construction | 3 | Balinghor/2T |
| 65 | 23,174,687 | Arezki | Construction | 3 | Djimande/1T |
| 66 | 1 256,924 | Arezki | Construction | 3 | Djimande/2T |
| 67 | 21,179,753 | Ereco-Grecons | Construction | 3 | Bougnadou/1 |
| 68 | 26,944,947 | Ereco-Grecons | Construction | 3 | Bougnadou/2 |
| 69 | 4,339,580 | EBTP | Construction | 3 | Balinghor/1GC |
| 70 | 3,588,909 | EBTP | Construction | 3 | Balinghor/2GC |
| 71 | 4,472,900 | EBTP | Construction | 3 | Djimande/1GC |
| 72 | 4,583,570 | EBTP | Construction | 3 | Djimande/2GC |
| 73 | 32,092,380 | Dagher | Construction | 3 | Talito/1 |
| 74 | 21,714,585 | Dagher | Construction | 3 | Toniataba/1T |
| 75 | 5,494,438 | Ebis | Construction | 3 | Toniataba/1GC |
| 76 | 250,000 | Mbaye | Topographical Services | 3 | |
| 77 | 57,242,747 | Arezki | Construction | 3 | Bona//1 |
| 78 | 13,885,500 | ACI | Video Services | | |
| 79 | 750,000 | Dieme | Topographical Services | 3 | |

| | | | | | |
|--------|-------------|------------------|----------------------------|---|---------------|
| 80 | 61,923,315 | Arezki | Construction | 3 | Segafoula |
| 81 | 26,600,000 | Senagrosol | Topo & Pedo Services | 3 | |
| 82 | 1,440,000 | Sud Info. | Computer Training | 3 | |
| 83 | 4,686,353 | EBTP | Cancelled | 3 | Madina Fin. |
| 84 | 825,000 | Seye | Topograhly Services | 3 | |
| 85 | 1,890,000 | Diedhiou | Engineer Services | 3 | |
| 86 | 7,081,595 | Bouette | Topographical Services | 3 | |
| 87 | 1,400,000 | Sahel Geo. | Topo. & Pedo Services | 3 | |
| 88 | 8,939,750 | BPS | Topograhical Services | 3 | |
| 89 | 3,405,000 | Senagrosol | Topograhical Services | 3 | |
| 90 | 8,037,650 | Dagher | Cancelled | 3 | Madina Fin. |
| 91 | 11,364,425 | BPS | Topograhical Services | 3 | |
| 92 | 1,491,675 | Bouette | Topograhical Services | 3 | |
| 93 | 8,037,650 | Dagher | Construction | 3 | K.Mangana/1&2 |
| 94 | 6,037,500 | Dagher | Construction | 3 | Nguindir/3 |
| 95 | 1,800,000 | Ngom | Sociology Services | 3 | |
| 96 | 12,830,580 | Cereeq | Geotechnical Services | | |
| 97 | 825,000 | Seye | Topograhly Services | 3 | |
| 98 | 1,890,000 | Diedhiou | Engineer Services | 3 | |
| 99 | 6,906,247 | Senagrosol | ONG Coordinator Services | | |
| 100 | 5,355,000 | Diedhiou | Engineer Services | | |
| 101 | 7,920,000 | Sud Info. | Computer Training | | |
| 102 | 2,200,000 | Seye | Topograhly Services | | |
| 103/95 | 600,000 | Ba | ONG/Training Services | 4 | |
| 104 | 1,920,000 | Sud Info. | Computer Training | | |
| 105 | 77,772,200 | Franzetti | Construction | 4 | Djnaki |
| 106 | 111,323,500 | Dagher | Construction | 4 | Birkama |
| 107 | 62,472,427 | Khayat | Construction | 4 | Colomba |
| 108 | 91,989,522 | Franzetti | Construction | 4 | Djimakakor |
| 109 | 119,290,600 | Dagher | Construction | 4 | Samine |
| 110 | 31,648,750 | Azerti | Construction | 4 | Boukiling |
| 111 | 35,231,115 | EGMBTV/Seck | Construction | 4 | N'Diama |
| 112 | 65,189,300 | Dagher | Construction | 4 | Silikine/T |
| 113 | 7,231,800 | EBTP | Construction | 4 | Silikine/GC |
| 114 | 640,000 | Sidy Makalou | Accounting Services | | |
| 115 | 3,955,000 | Daniel Gerard | Worksite Supervisor Svc. | | |
| 116 | | NOT USED | | | |
| 117 | 5,836,140 | APEC | ONG Evaluation | | |
| 118 | 1,560,000 | Sud-Informatique | Data Collection & Anal. | | |
| 119 | 39,348,600 | Arezki | Construction | 4 | Diango |
| 120 | 48,660,800 | Sosachim | Spillway Gate Fabrication | | |
| 121 | 21,601,200 | EBIS | Construction | 2 | Bougnadou |
| 122 | 36,900,740 | Dagher | Construction | 2 | Badobar |
| 123 | 22,417,250 | EBTP | Construction | 2 | Badobar |
| 124 | 8,800,000 | Dagher | Construction | 2 | Badobar |
| 125 | 1,470,000 | Sud-Informatique | JRA Study Coll.& Anlalysis | | |
| 126 | 480,000 | EBTP | USAID Plaques | | |
| 127 | 5,512,000 | Sud-Informatique | Data Coll. and Analyisi | | |

**TABLE FOR SECTION 7.4.2
SUMMARY OF CONTRACT MODIFICATIONS**

| MOD No. | Date | Purpose | Amount | Cumulative Contract Amount |
|----------------|----------------|---|---------------|-----------------------------------|
| 1 | Aug. 30, 1991 | Transfer Administration from REDSO to USAID/Dakar | 0 | 8,936,260 |
| 2 | Feb. 14, 1992 | Revise duties of COP to focus on village participation, hire local accountant, and increase funding for accountant and equipment which originally was to be directly purchased by USAID. | 392,206 | 9,328,466 |
| 3 | May 18, 1992 | Revise Scope of Work to limit village participation in construction work and transfer responsibility for earthwork to contractors.. | 0 | 9,328,466 |
| 4 | Mar. 29, 1993 | Increase level of effort of sociologist by 6 months and required funding. | 70,366 | 9,398,832 |
| 5 | Dec. 29, 1993 | Increase level of effort of sociologist by additional 3 months, provide additional funds for sociologist, local work site supervisors, vehicle drivers, trucker drivers and commodities | 433,643 | 9,832,475 |
| 6 | Mar. 15, 1994 | Revise budget to incorporate costs associated with evacuation and resettlement of field team from Ziguinchor-Banjul-Kolda-Ziguinchor | 289,281 | 10,121,756 |
| 7 | June 1, 1994 | Cover costs of additional expendable supplies, finance construction of additional water control structures, incorporate and fund new NGO component. | 1,907,647 | 12,029,403 |
| 8 | Sept. 29, 1994 | Provide additional funds for salaries, wages, increase level of effort for Programmatic Environmental Review, supervise ISRA study and baseline studies, carry out additional engineering design work and reinforced concrete designs; extend operation and maintenance costs for project vehicles. | 2,770,005 | 14,799,408 |
| 9 | June 30, 1995 | Extend contract completion date to July 21, 1995 to complete construction program IV; monitor status of previous programs, and perform provisional and/or final acceptance of the structures. | 0 | 14,799,408 |
| 10 | Aug. 8, 1995 | Extend contract to August 21, 1995 and reduce in-country level of effort to one individual (Admin. and Finance Manager). | 0 | 14,799,408 |
| 11 | Sept. 22, 1995 | Extend life of contract to December 29, 1995 | 0 | 14,799,408 |
| 12 | Oct. 11, 1995 | Revise Scope of Work and change budget amounts, to reflect previous extension periods | 116,592 | 14,916,000 |
| 13 | Dec. 26, 1995 | Extend life of contract to January 30, 1996, to complete contract close-out . | 0 | 14,916,000 |

APPENDICES

APPENDIX I

Reports List

REPUBLICQUE DU SENEGAL

 MINISTERE DE L'AGRICULTURE

 DIRECTION DU GENIE RURAL

 PROJET GESTION DE L'EAU
 DANS LA ZONE SUD (PROGES)

BP. 24/TEL:91.18.20

ANNEXE I
REPORTS LIST

| N° | REPORTS | DATES | Référenc. | Nbre de Volumes |
|---------------------------------------|------------------------------|--------------|-----------|-----------------|
| I Work Plan - Progress Reports | | | | |
| A / Monthly Reports | | | | |
| 1 | Monthly progress Report | Januar. 1991 | | 1 |
| 2 | Monthly progress Report | Febr. 1991 | | 1 |
| 3 | Monthly progress Report | Marc. 1991 | | 1 |
| 4 | Monthly progress Report | April 1991 | | 1 |
| 5 | Monthly progress Report | May 1991 | | 1 |
| 6 | Monthly progress Report | June 1991 | | 1 |
| 7 | Monthly progress Report | July 1991 | | 1 |
| 8 | Monthly progress Report | Aug. 1991 | | 1 |
| 9 | Monthly progress Report | Sept. 1991 | | 1 |
| 10 | Monthly progress Report | Nov. 1991 | | 1 |
| 11 | Monthly progress Report | Mar/ap 1992 | | 1 |
| 12 | Monthly progress Report | May/Jun 1992 | | 1 |
| 13 | Monthly progress Report | July 1992 | | 1 |
| 14 | Rapport du mois de Janvier | Janv. 1993 | | 1 |
| 15 | Rapport du mois de Fevrier | Fev. 1993 | | 1 |
| 16 | Rapport du mois de Mars | Mars 1993 | | 1 |
| 17 | Rapport du mois de Avril | Avr. 1993 | | 1 |
| 18 | Rapport du mois de Mai | Mai 1993 | | 1 |
| 19 | Rapport du mois de Juin | Juin 1993 | | 1 |
| 20 | Rapport du mois de Juillet | Juil. 1993 | | 1 |
| 21 | Rapport du mois de Aout | Aout 1993 | | 1 |
| 22 | Rapport du mois de Septembre | Sept. 1993 | | |
| 23 | Rapport du mois de Novembre | Nov. 1993 | | 2 |

| | | | | |
|-----------------------------|---|---------------|--|----|
| 24 | Rapport du mois de Décembre | Déc. 1993 | | 2 |
| 25 | Rapport du mois de Janvier | Janv. 1994 | | 2 |
| 26 | Rapport du mois de fevrier | Fev. 1994 | | 1 |
| 27 | Rapport du mois de Avril | Avril 1994 | | 1 |
| 28 | Rapport du mois de Mai | Mai 1994 | | 1 |
| 29 | Rapport du mois de Juillet | Juill. 1994 | | 2 |
| 30 | Monthly progress Report | Aug. 1994 | | 2 |
| 31 | Monthly progress Report | Sept. 1994 | | 2 |
| 32 | Rapport du mois de Novembre | Nov. 1994 | | 1 |
| 33 | Rapport d'Activités (Jan/Déc.1994) | Déc. 1994 | | 1 |
| 34 | Rapport du mois de Janvier | Janv. 1995 | | 1 |
| 35 | Rapport du mois de fevrier | Fevr. 1995 | | 1 |
| 36 | Rapport du mois de Mars | Mars 1995 | | 1 |
| 37 | Rapport du mois de Avril | Avr. 1995 | | 1 |
| B / Quaterly Report | | | | |
| 1 | Rapport d'Activités trimestriels (Nov.91.Dec.91-Janv. 1992) | Jan. 1992 | | 1 |
| 2 | Rapport trimestriel du mois de mars | Mars 1994 | | 2 |
| 3 | Rapport trimestriel du mois juin | Juin 1994 | | 2 |
| 4 | Rapport trimestriel du mois de Septemb. | Sept. 1994 | | 1 |
| 5 | Rapport trimestriel du mois de Décemb. | Déce. 1994 | | 4 |
| 6 | Rapport trimestriel du mois de Jan. 1995 | Janv. 1995 | | 1 |
| 7 | Quaterly report july-October 1995 | Nov. 1995 | | 1 |
| C / Annual Reports | | | | |
| 1 | Plan de Travail et Budget Annuel | 1989/1990 | | 2 |
| 2 | Plan de Travail et Budget Annuel | Nov. 1990 | | 1 |
| 3 | Plan de Travail et Budget Annuel | Mai 1991 | | 3 |
| 4 | Plan de Travail et Budget Annuel | Déc. 1991 | | 2 |
| 5 | Plan de Travail et Budget Annuel | Mai 1992 | | 5 |
| 6 | Plan de Travail et Budget Annuel | June 1992 | | 2 |
| 7 | Plan de Travail et Budget Annuel | Déc. 1992 | | 1 |
| 8 | Annual work Plan and Budget | Jan/June 93 | | 7 |
| 9 | Annual work Plan and Budget | Jul.93/jun.94 | | 14 |
| 10 | Plan de Travail et Budget Annuel | July 94 | | 1 |
| 11 | Annual Work Outline Jul.94/jun 95 | Apr. 94 | | 1 |
| 12 | Annual Work Plan and Budget 1 ^m . 2 nd . 3 ^h . 4 th Draft | Nov. 1994 | | 4 |
| 13 | Annual work Plan and Budget Final ver. | Déc. 1994 | | 1 |
| 14 | Annual work Plan and Budget 4th Draft | Jul.94/jun.95 | | 1 |
| 15 | Annual work Plan and Budget Final ver. | Jul.94/Jun.95 | | 3 |
| II TECHNICAL REPORTS | | | | |
| A - Project Reports | | | | |
| I Année 1991 | | | | |

| | | | | |
|-------------------|---|--------------|----------|----|
| 1 | Données de Base Agro-Economiques dans les Vallées de Mayor et de Ngindir | 1991 | 91 - 1 | 3 |
| 2 | Rapport de Mission de l'expert en pédologie | Mai 1991 | 91 - 2 | 2 |
| 3 | Rapport de mission de Dr St. DAUS | Aout-Sep. 91 | 91 - 3 | 9 |
| | | | | |
| 1 | Village organization Experience: lesson learned after year one (section sociologie) | Febr. 1991 | 92 - 1 | 5 |
| 2 | Training report based on mission by Dr L. Velupillai | August 1992 | 92 - 2 | 3 |
| 3 | Rapport de mission du Dr L. Velupillai (version franc.) | aout 1992 | 92 - 3 | 8 |
| 4 | Watershed planning methodology engineering design, soil conservation and environmental motoring C. PASKETT) | Aug. 1992 | 92 - 4 | 3 |
| 5 | Recommandations and trip report of august (J. COOPER) | Sept. 1992 | 92 - 5 | 9 |
| 6 | Compte rendu et recommandations de la IIe session du CNS | Sept. 1992 | 92 - 6 | 3 |
| 7 | Séminaire d'information des entreprises du secteur privé de la région de Kolda | " | 92 - 7 | 2 |
| 8 | Etude cartographique des sols des vallées de Ngindir - Mayor et Bassada (Sonagrosol) | " | 92 - 8 | 2 |
| 9 | Economic and Financial Analysis of Various Aspects of the SZWMP (T. Zalla) | Nov. 1992 | 92 - 9 | 1 |
| 10 | Data Needs for SZWMP motoring Programs (T. Zalla) | Dec. 1992 | 92 - 10 | 5 |
| 11 | Report on Project Founded training (Eric Allemanno) | Nov. 1992 | 92 - 11 | 1 |
| 12 | Rapport de consultation (T. Zalla) | " | 92 - 12 | 11 |
| 13 | consultant's report training spécialiste (Dr Eric Allemanno) | Nov. 1992 | 92 - 13 | 5 |
| 5 14 | Séminaire d'Information des Entreprises du secteur privé de la Région de Ziguinchor (B.NGOM et I. THIAM) | Aout 1992 | 92 - 14 | 8 |
| 15 | Rapport Bilan des Parcelles Pilotes dans les Vallées de Mayor et de Ngindir (Programme Agricole 1992) | Déc. 1992 | 92 - 15 | 2 |
| Année 1993 | | | | |
| 1 | The role of NGOS in the SZWMP: during and after the project proposal and budget . | Febr. 1993 | 93 - 1 | 4 |
| 2 | Rapport sur la sélection des sites du programme III | Avril 1993 | 93 - 2 | 2 |
| 3 | Rapport de Stage: Conservation des eaux et sols (CES) Fernando KAO | Mai 1993 | 93 - 3 a | 2 |

| | | | | |
|------------|---|-------------------|-----------|---|
| 4 | Rapport de Stage : Conservation des eaux et sols (CES) Lucien DIEME | Mai 1993 | 93 - 3 b | 2 |
| 5 | Monographies des Vallées du programme I et II (S. Sociologie) | Mai 1993 | 93 - 4 | 1 |
| 6 | Programmatic Environmental Review (LBII) | " | 93 - 5 | 4 |
| 7 | A Methodology for village participation in water management | Juin 1993 | 93 - 6 | 2 |
| 8 | The Experience of construction and village participant (s.sociologie) | " | 93 - 7 | 2 |
| 9 | Training Advisor mission (L. Velupillai) | June 1993 | 93 - 8 | 2 |
| 10 | 2nd Atelier de Formation de ONG Adecor et Form'Action | Juil. 1993 | 93 - 9 | 1 |
| 11 | Les systèmes de collectes de données et de Suivi au Proges | 20 juil. 1993 | 93 - 10 | 5 |
| 12 | Notice Explicative des cartes d'occupation des sols (Senagrosol) | Juillet 1993 | 93 - 11 | 2 |
| 13 | Mission report of Dr L. Velupillai | 25 juin/4 juil 92 | 93 - 12 | 3 |
| 14 | Data collection and motoring sytems at SZWMP (T. Zalla) | August 1993 | 93 - 13 | 4 |
| 15 | Etude sur l'organisation et la gestion des fonds de roulement des vallées du Proges (M. TOURE) | Aout 1993 | 93 - 14 | 2 |
| 16 | Organization and comprehensive motoring and research program with ISRA and competion of PER (J. Cooper) | Sept. 1993 | 93 - 15 | 4 |
| 17 | Rapport d'Exécution du programme de Formation en Informatique | Sept. 1993 | 93 - 16 | 3 |
| 18 | Guide d'Animation pour une Action participative des populations rurales dans la Gestion de l'eau (sect. Agr.) | Oct. 1993 | 93 - 17 | 2 |
| 19 | Programme d'Aménagement Hydro-Agricole. (avis de préqualification) | " | 93 - 18 | 1 |
| 20 | Programme d'Exécution Technique et Financier (V.R. N 1) ISRA | Nov. 1993 | 93 - 19 | 5 |
| 21 | Enquêtes Socio-Economiques et Agricoles dans trois vallées de la moyenne Casamance (Campagne 1991-1992) | Nov. 1993 | 93 - 20 | 4 |
| 22 | Rapport d'Activités au 31 10 93 gestion 1992/1993 (CNS) | Nov. 1993 | 93 - 21 | 2 |
| 23 | Etat d'Exécution des Recommandations issues de la 1 ^e session de la gestion 1992/1993 | Déc. 1993 | 93 - 22 a | 1 |
| 24 | Rapport d'Activités au 31 10 93 gestion 1991/1992 (CNS) | Déc. 1993 | 93 - 22 b | 3 |
| 25 | Rapport de la Formation des conducteurs de travaux (CFP) | Déc. 1993 | 93 - 23 | 4 |
| Année 1994 | | | | |

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|----|---|-------------|---------|----|
| 1 | Etudes Pédologiques des vallées de Balinghor, Djimande et Diatang (Travaux de Synthèse) | Janv. 1994 | 94 - 1 | 1 |
| 2 | Supplementary Information for Mi-Term Project Evaluation Team | Janv. 1994 | 94 - 2 | 3 |
| 3 | Rapport Final sur les Etudes Géotechniques du Programme III (Annexe I) - courbes granulométriques (M. DIENE) | Janv. 1994 | 94 - 3 | 4 |
| 4 | Rapport Final sur les Etudes Géotechniques du Programme III (Annexe II) - courbes Oedométriques (M. DIENE) | Janv. 1994 | 94 - 4 | 3 |
| 5 | Rapport Final sur les Etudes Géotechniques du Programme III (Annexe III) - cisaillements dirctes (M. DIENE) | Janv. 1994 | 94 - 5 | 4 |
| 6 | Rapport final sur les Etudes Géotechniques du Proges (USAID) | Janv. 1994 | 94 - 6 | 4 |
| 7 | Prise en main Autocad 12 (Sud Informatique) | Fev. 1994 | 94 - 7 | 4 |
| 8 | Etudes Socio-Economiques et Agricoles dans trois vallées de la moyenne Casamance (Campagne 1991/1992) SENECEI | Fev. 1994 | 94 - 8 | 2 |
| 9 | Programme d'Execution Technique et Financier n° 2 (SENECEI) | Fev. 1994 | 94 - 9 | 1 |
| 10 | Vehicle Analysis Report | Mars 1994 | 94 - 10 | 1 |
| 11 | Implementation of P E R for SZWMP (LBII) | Mars 1994 | 94 - 11 | 5 |
| 12 | Programmatic Environmental Review for SZWMP (LBII) | Mars 1994 | 94 - 12 | 4 |
| 13 | Etudes Socio-Economiques et Agricoles dans trois vallées de la moyenne Casamance (SENECEI) | Mars 1994 | 94 - 13 | 3 |
| 14 | Bilan des Réalisations du Proges Fev.92 à Déc. 93 | Av. 1994 | 94 - 14 | 3 |
| 15 | Résultats définitifs des superficies et productions des cinq vallées du Proges (IRA) | Av. 1994 | 94 - 15 | 10 |
| 16 | Etude Pédologique des vallées de Djinoubor, Silinkine et Djinaki (Vers. F) Sonagrosol | Av. 1994 | 94 - 16 | 3 |
| 17 | Données Sociologiques des vallées du Programme IV | Avr- Mai 94 | 94 - 17 | 3 |
| 18 | Review further Development of Comprehensive motoring and research Program with Isra (J. Cooper) | May 1994 | 94 - 18 | 1 |
| 19 | Rapport Technique 1° et 2° trimestre année I (Isra) | Mai 1994 | 94 - 19 | 7 |
| 20 | Fiches d'Identification de chaque vallée visitée (mission USAID) | Juin 1994 | 94 - 20 | 3 |
| 21 | Rapport de Stage au B. Faso (D. Gaye et X. Badji) | Juin 1994 | 94 - 21 | 2 |

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|-------------------|--|--------------------|---------|---|
| 22 | Initial Environmental Examinations for Program 1 . 2 . 3 vallées (LBII) | Juin 1994 | 94 - 22 | 5 |
| 23 | Training Advisor Report L Velupillai | | 94 - 23 | 6 |
| 24 | Rapport Financier troisième Trimestre Année 1 (N.I. Sonko) ISRA | Juil 1994 | 94 - 24 | 2 |
| 25 | Review and further Development of comprehensive motoring and research program with Isra and finalization of Environmental assessment process (J. Cooper) | July 1994 | 94 - 25 | 7 |
| 26 | Rapport de mission (Louis Haldin) | Juillet 1994 | 94 - 26 | 6 |
| 27 | Revue Environnementale Programmatique pour le Proges (Usaid) | Sept. 1994 | 94 - 27 | 3 |
| 28 | Programme d'Aménagement Hydro-Agricole (Avis de préqualification des entreprises version V) | Sept. 1994 | 94 - 28 | 3 |
| 29 | Rapport de synthèse des Activités de l'Agriculture (Juin 93 - Juil 94) | Oct. 1994 | 94 - 29 | 3 |
| Année 1995 | | | | |
| 1 | Méthodologie d'évaluation des techniciens Sénégalais | Janv. 1995 | 95 - 1 | 2 |
| 2 | Planning a fish production program for village affected by Proges (Dr Greenland) | Janv. 1995 | 95 - 2 | 4 |
| 3 | Femmes et Formation en gestion Appliquée (FEFGA) | Mai 94/ Juin 95 | 95 - 3 | 3 |
| 4 | Rapport du consultant Montage participatif des comités de gestion (Saer Adam BA) | Janv. 1995 | 95 - 4 | 2 |
| 5 | Méthodologi Manual Implementing contourn bern systems | Feb. 1995 | 95 - 5 | 6 |
| 6 | Rapport technique quatrième trimestre Année 1 | Fev. 1995 | 95 - 6 | 1 |
| 7 | Planning des Activités de recherches et budget Année II (Isra) | Fev. 1995 | 95 - 7 | 4 |
| 8 | The dikes and their water control work (LBII 17/03/95) | March 1995 | 95 - 8 | 1 |
| 9 | Rapport sur les dommages causés aux digues de la vallée de Badobar par les crues de juillet 94 (LBII) | Av. 1995 | 95 - 9 | 2 |
| 10 | Résultats définitifs de l'enquête Agricole au niveau des vingt cinq vallées du Proges (IRA/Z/K | Av. 1995 | 95 - 10 | 3 |
| 11 | Parcelles pilotes de démonstration dans les vallées du programme III (Campagne 1994/1995) | Av. 1995 | 95 - 11 | 3 |
| 12 | Manuel de méthodologie : Execution de système des courbes de niveau | Mai 1995 | 95 - 12 | 5 |
| 13 | Rapport technique septième trimestre (mars-Av.-mai) Année 2 | Juin 1995 | 95 - 13 | 1 |
| 14 | Rapport technique septième trimestre (sept/oct./nov.) Année 2 | Juin 1995 | 95 - 14 | 1 |

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|----|--|--------------|---------|---|
| 15 | Rapport technique septième trimestre (Déc./janv./fev.) Année 2 | Juin 1995 | 95 - 15 | 2 |
| 16 | Report training carried out with Proges | Fev. 1995 | 95 - 16 | 4 |
| 17 | Rapport technique septième trimestre (Mars/Av./Mai.) Année 2 | Juin 1995 | 95 - 17 | 1 |
| 18 | Bilan des ONG et de Programme de Formation. | Juillet 1995 | 95- 18 | 3 |
| 19 | Manuel pour la Gestion des ouvrages hydrauliques | Juillet 1995 | 95 - 19 | 3 |
| 20 | Bilan et Perspective d'Avenir | Sept. 1995 | 95 - 20 | 2 |
| 21 | Programme de compostage de la campagne Agricole 1995 : Evaluation technique à mi-parcours (O. KANE) | 1995 | 95 - 21 | 1 |
| 22 | Relationships between soil, acidity eh, lime and flooding | Oct. 1995 | 95 - 22 | 7 |
| 23 | Relation entre acidité des sols eh. chaux et inondation | Oct. 1995 | 95 - 23 | 4 |
| 24 | Mission pour la gestion et l'Evaluation des ouvrages hydraulique dans les vallées du Proges (Eric VERLINDEN) | Oct. 1995 | 95 - 24 | 5 |
| 25 | Final Review and Assessment of Comprehensive Motoring and Environmental studies program conducted under a cooperative agreement with senegalese institutr for agricultural research (ISRA) | Nov. 1995 | 95 - 25 | 1 |
| 26 | Rapport Scientifique Annuel du Volet de Recherche Appliquée et de Suivi | Fev. 1995 | 95 - 26 | 1 |
| 27 | Training Advisor Mission Report L Velupillai . | Fev. 1995 | 95 - 27 | 1 |
| 28 | Consultant Report : Soil & Water conservation Systems for Agricultural Valleys . Casamance Region Senegal | Febr. 1995 | 95-28 | 2 |
| 29 | Rapport d'evaluation de l'Impact des ONG collaborant avec le Projet de gestion de l'Eau dans la Zone Sud | Juin 1995 | 95-29 | 1 |
| 30 | Rapport Final sur le Programme test de diguettes sur courbes de niveau K. Coly | Juil. 1995 | 95-30 | 2 |
| 31 | Situation des travaux dans les chantiers inachevés ou réceptionnés avec réserves en date du 21 juillet 1995 | Aout 1995 | 95-31 | 1 |
| 32 | Résultats d'Analyse Enquêtes Ménages Phase I Campagne 1994/1995 (cellu. Suivi-Eval.) | Nov. 1995 | 95-32 | 2 |
| 33 | Rapport Final du Volet de Recherche Appliquée et de Suivi (ISRA) | 27/10/95 | 95-33 | 1 |

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|--------------------------|---|---------------|---------|---|
| 34 | Rapport Final du Volet de Recherche Appliquée et de Suivi. Annexes | 27/10/95 | 95-34 | 1 |
| | | | | |
| 1 | Cahier des Prescriptions Spéciales (CPS) Vallée de Mayor | Nov. 1991 | Ing. 1 | 1 |
| 2 | Avis de consultation restreinte (vallée de Nguindir) | Déc. 1991 | Ing. 2 | 1 |
| 3 | Cahier des Prescriptions techniques p 2 CPT (vallée de Nguindir) | Déc. 1991 | Ing. 3 | 4 |
| 4 | Cahier des Prescriptions techniques p 2 CPT (vallée de Mayor) | Déc. 1991 | Ing. 4 | 4 |
| 5 | Proces verbaux de dépouillement des offres (Mayor et Nguindir) | Janv. 1992 | Ing. 5 | 2 |
| 6 | Etude des offres (Mayor et Nguindir) | Janv. 1992 | Ing. 6 | 2 |
| 7 | Dossier descriptif du Projet (DDP) p 1-1 | Nov. 1992 | Ing. 7 | 1 |
| 8 | Dossier Descriptif et Technique (DDT) vol. 1 | Nov. 1992 | Ing. 8 | 8 |
| 9 | Dossier Descriptif et Technique (DDT) vol. 1 | Juin 1993 | Ing. 9 | 1 |
| 10 | Cahier des prescriptions techniques spéciales (CPTS) vol. 3 | Nov. 1992 | Ing. 10 | 2 |
| 11 | Cahier des prescriptions techniques spéciales (CPTS) vol. 3 | Av. 1993 | Ing. 11 | 1 |
| 12 | Cahier des Prescriptions Générales (CPG) | Déc. 1993 | Ing. 12 | 1 |
| 13 | Cahier des Prescriptions Générales (CPG) | Fev. 1994 | Ing. 13 | 1 |
| 14 | Cahier des Prescriptions Générales (CPG) | Nov. 1994 | Ing. 14 | 4 |
| 15 | Cahier des Prescriptions Générales (CPG) | Fev. 1995 | Ing. 15 | 3 |
| 16 | Dossier technique de l'Aménagement (DTA) vallée de Silinkine | Déc. 1994 | Ing. 16 | 1 |
| 17 | Dossier technique de l'Aménagement (DTA) vallée de Ndiama | Déc. 1994 | Ing. 17 | 2 |
| 18 | Annexes (Emprunts et carrieres) | | Ing. 18 | 1 |
| 19 | Etude des avant-projet sommaire du programme IV rap. provis. | | Ing. 19 | |
| 20 | Etude des avant-projet sommaire du programme III 2 ^e partie Rapp. explicatif | 25 juil. 1993 | Ing. 20 | 1 |
| 21 | Etude des avant-projet sommaire du programme III 2 ^e e p. rapp. prov. | 15 juil. 1993 | Ing. 21 | 1 |
| C - USAID REPORTS | | | | |

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|--------------------------|---|------------|--|----|
| 1 | Project Identification document (P I D) | 27/05/87 | | 1 |
| 2 | Accord de Subvention entre la République du Sénégal et les Etats Unis d'Amérique | 22/08/88 | | 2 |
| 3 | Résumé stratégique du programme de USAID au Sénégal 1992/1997 | | | 2 |
| 4 | Plan stratégique 1992 - 1997 | Fev. 1991 | | 1 |
| 5 | Rapport d'Evaluation à mi-parcours du Proges | Mars 1994 | | 12 |
| 6 | Mid -Term Evaluation Report | March 1994 | | 2 |
| 7 | Project Paper Supplement (PPS) | July 1994 | | 2 |
| 8 | Revue conjointe Gouvernement du Sénégal -USAID | Dec. 1994 | | 4 |
| 9 | Enquêtes sur les connaissances . attitudes et Pratiques Agricoles et de Gestion des Eaux (Résumés et Analyses des Résultats) | Déc. 1994 | | 3 |
| 10 | Enquêtes sur les connaissances, attitudes et Pratiques Agricoles et de Gestion des Eaux (Rapport d'Enquêtes) Version Provis. | Déc. 1994 | | 3 |
| 11 | Enquêtes sur les connaissances, attitudes et Pratiques Agricoles et de Gestion des Eaux (Résumés et Analyses des Résultats) Version finale | Janv. 1995 | | 2 |
| 12 | Enquêtes sur les connaissances , attitudes Pratiques Agricoles et de Gestion des Eaux (Résultats des Enquêtes) Version final | Janv. 1995 | | 3 |
| 13 | USAID/Identity Policy (english version) | Febr. 1995 | | 1 |
| 14 | Supplément n0 2 au document du projet | Mars 1995 | | |
| 15 | Project Paper Supplement n0 2 | July 1995 | | 2 |
| D/ OTHERS REPORTS | | | | |
| 1 | Rapport de mission du consultant en Casamance (21 avril - 18 mai 1991) A. AUBRUN | Mai 1991 | | 2 |
| 2 | Proès verbaux de dépouillement des offres relatives à la consultation du 18/12/91 (vallées de Mayor et Nguindir) | Janv. 1992 | | 1 |
| 3 | Etude des Offres relatives à la consultation du 18/12/91 (vallées de Mayor et Nguindir) | Janv. 1992 | | 1 |
| 4 | Rapport de mission de l'expert en genie civil du 11 - 28 avril 1992 . | Mai 1992 | | 1 |

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| 5 | Méthodologie d'Evaluation des Techniciens Sénégalais en vue du paiement du bonus pour performances exceptionnelles. | Juillet 1992 | | 1 |
| 6 | Evaluation des besoins en sociologie requêtes de prolongation du contrat du sociologue | | | 1 |
| 7 | Journée de réflexion CTS & PMU | 09 juil. 1992 | | 1 |
| 8 | Rapport annuel (Année II 1992 | Déc. 1993 | | 1 |
| 9 | Annuaire des ONG et Projets de la Région de Kolda | 1993 | | 2 |
| 10 | Rapport de situation des Parcelles Pilotes du Programme II . (Badobar - Kandion -Mangana - Kounouding Dioé) | 1993 | | 4 |
| 11 | Rapport de Pré- Sélection (Sect, Génie R,) | Mars 1993 | | 2 |
| 12 | Programme de mesures dans les vallées de Mayor et Nguindir. | Fev. 1993 | | 1 |
| 13 | Dossier CEREF Vallées de Kounouding Dioé - Kandion Mangana - Badobar | 1993 | | 1 |
| 14 | Séminaire d'Information des ONG de la Région de Kolda des Activités du Proges. | 23 02 1993 | | 4 |
| 15 | Soumission : Programme II d'aménagement Hydro-Agricoles : Vallée de Balinghor V.II | Avr. 1993 | | 1 |
| 16 | Guide d'Animation pour la Participation des villageois dans le Proges . | Juil. 1993 | | 1 |
| 17 | Complément des études Géotechniques du Programme III | Mars 1993 | | 1 |
| 18 | Economis and Sensitivity analysis of the Sénégal SZWMP june 14 1994 | Juin 1994 | | 1 |
| 19 | Rapport du Bilan-Contrat de l'A.T. Agronome de LBII (Oct. 90-Oct. 94) | Octob. 1994 | | 1 |
| 20 | Rapport de Base (ISRA) Déc. 1994 | Déc. 1994 | | 1 |
| 21 | Enquêtes Sociologiques pour la sélection des vallées du programme IV du proges vallée de Colomba / B. Sambou | Mai 1994 | | 1 |
| 22 | Idem vallée de Diagon | " | | 1 |
| 23 | Idem..... vallée de Djimakakor | " | | 1 |
| 24 | Idem vallée de Diango | " | | 1 |
| 25 | Manuel d'Implantation d'Ouvrages | Fev. 1995 | | 1 |
| 26 | Compte Rendu de la Réunion du comité National de suivi (CNS) | 26 /27 /06/95 | | 1 |

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|-----------------------|---|-----------------------------|--------------|---|
| 27 | Rapport de l'Atelier de Formation en Diagnostic Participatif | 03/Déc. 1994 | | 1 |
| DOCUMENTATIONS | | | | |
| 1 | Watershed protection & Environnement Land Planning Study (Overall Main & Report) | AURORA | | |
| 2 | Water Technology Internatiomnal | | | |
| 3 | Document Systems Agraires "Aménagement Hydro-Agricole et Systèmes de Production (Tome I) | | 1992 | |
| 4 | Rice in West Africa | Scott R. Pearson J.Dirck | | |
| 5 | Réhabilitation des Sols salés et Acides de Basse Casamance | Ostom/Isra | | |
| 6 | Recensement et Etude des Procédés Techniques de Normes d'Épuration | Aboubacry Kane | | |
| 7 | Analyse pour la Gestion des Ressources Naturelles du Sénégal "Rapport final " | D.E.G. | | |
| 8 | Tide Tables volume 2 | | 1992 | |
| 9 | Soil Salinity and Acidity Spécial Variability and affects on rice Production | Mabeye Sylla | | |
| 10 | Estimation des débits de Crues pour les Bassins Versant de superficie inférieure à 200 kms | | | |
| 11 | Financement d'un fonds de Roulement pour la commercialisation des semences de riz | SEDAB SARL | Mai 1994 | |
| 12 | Journées de Reflexion sur la problématique de l'aménagement des bas fonds (Sédhiou) Rapport Final | PRIMOCA | Juillet 1992 | |
| 13 | Rapport sur Essai Rizicol de la Vallée de Djiginoun | (D. Brunet P. Zante) | Mai 1990 | |
| 14 | Etude Pédologique des Sites de Soumboundou et de Diannah Malary | Sonagrosol | Mai 1988 | |
| 15 | Description des Variétés | | Sept. 1993 | |
| 16 | Environnement et Sols des Estuaires de la Guinée-Bissau | | | |
| 17 | Typologie des Sols | | | |

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|----|--|-------------------|---------------|--|
| 18 | PASA et LPDA Programme d'Ajustement Sectoriel Agricole | | Aout 1994 | |
| 19 | Proces Verbal de la 2e Réunion du réseau de mangroves | | 12-13 mars 92 | |
| 20 | LES PAYSANS du Sénégal les civilisations agraires du Cayor à la Casamance | Paul PELISSIER | 1966 | |
| 21 | Perpectives du Centre de Formation Agricole (CFA) | PRIMOCA | 1994 | |
| 22 | Réhabilitation des Sols Salés et Acides de Bassa Casamance | J.P. MONTOROI | Avril 1991 | |
| 23 | Essai de Mise en Valeur Agricole des Sols Salés, Sulfatés Acides | ISRA | 26 fev 1991 | |
| 24 | Alimentation en eau d'une Communauté (PSTP) | | | |
| 25 | Proposition de programmes d'Enseignement pour la filière Agricole(ENCR Bambey) | | | |
| 26 | A Study of Rice cultivation practices in the arondissement of Dioulakolon | 1990 | | |
| 27 | International Programs | LSU | | |
| 28 | Bulletin Epidémologique (HIV) CNPS | | Déc. 1993 | |
| 29 | Using Indégenous Knowledge in Agricultural Development | D. Michael Warren | | |
| 30 | Etude Socio-Economique du Bassin du Fleuve Sénégal partie C | | | |
| 31 | Etude Socio-Economique du Bassin du Fleuve Sénégal partie E Interprétation et introduction de la culture irriguée | | | |
| 32 | Irrigation and AID'S Expérience A considération based on Evaluation | | Aug. 1983 | |
| 33 | Master plan of Agricultural Development of the lower Casamance Final report vol II | Aurea | | |
| 34 | Aménagement de la Vallée de Bignona Etude Socio-Economique phase I | | Juin 1984 | |
| 35 | Expériences d'Aménagements Hydro-Agricoles dans la moyenne Vallée du Sénégal | ORSTOM | Aout 1978 | |
| 36 | Structure Foncière du Waolo futanké 'les Terres inondables de la moyenne Vallée du Sénégal | ORSTOM | | |

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|----|--|------------------|---------------|---|
| 37 | Economies Rurales et Emmigrations de la Région de Waoundé (Vallée du Sénégal) Etudes des deux villages soninké et halpulaar | ORSTOM | Mai 1978 | |
| 38 | Agricultural Development and policy in Sénégal : Annotated Bibliographie of recent studies | | 1983/19 89 | |
| 39 | Participatory Management in Srilanka's Irrigation shemas | | | |
| 40 | Technical Proposal | LBII | fev 1990 | |
| 41 | Sénégal Agricultural Sector Analysis | | Jan. 1991 | |
| 42 | Diobass : Les Paysans et leur Terroirs | | | |
| 43 | Integrated Management of Agricultural (Watersheds | | Nov. 1991 | |
| 44 | Organisational Alternatives to Improve on Water Management in Pakistan | Georges E. R. | | |
| 45 | Development Management in Africa | AID | Dec. 1985 | |
| 46 | Actions Planning Workshops for Development Management | Guidelines | | |
| 47 | Study of Irrigation communities in CHAD (phase II report) | | | |
| 48 | Etude Hydrologique des sites de Mka Belal (B2 et d'Alexandrie (EII) | | | |
| 49 | Etudes de remembrement des Sites EII et B2 du projet de stockage des eaux de ruissellement au Sénégal | | Aout 1990 | |
| 50 | The impacts of Irrigation on development issues for a comprehensive Evaluation study | | | |
| 51 | Etudes socio-Economique du Bassin du Fleuve Sénégal(rappoert Général Avant-propos) | | | |
| 52 | Prospects for small scale irrigation development in Sahel | USAID | | |
| 53 | Participation Experiences in irrigation Water management | FAO | | |
| 54 | Information des Entreprises 1994 " Les Actions de Formation au C.F.P. " | | | 2 |

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|----|--|---------------------------|--|---|
| 55 | Unité Naturelle et Quadrillage Ethnique de la Casamance 2 e partie de " Les Paysans du Sénégal " | | | |
| 56 | Evaluation rapide des problèmes de Nutrition au niveau communautaire Une Etude de cas : Parbhani, Inde | P. Kashyap R. H. Young | | |
| 57 | Sénégal Reforestation Project End of tour report training | Ruth D. Haris | | 2 |
| 58 | Sénégal Reforestation Project Training Plan | 1989-1993 | | |
| 59 | Résumé et Bilan des Diagnostics Participatifs Réalisés aux Villages de Niagha, Karantaba, Saré Tening, Sobali, Karoumbou, Kafoul | 13 07 1994 13 08 1994 | | 2 |
| 60 | Etude de remembrement des Sites E11 et B2 du Projet de Stockage des Eaux de Ruisellement au Sénégal | Aout 1990 | | |
| 61 | Chapitre 1 - Capacités Institutionnelles entrant dans le Cadre et les Objectifs du Projet - Proposition Technique | | | |
| 62 | Projet Pilote " Casamance Bas Fond de DJIGUINOUM Rapport de synthèse: Hydrologie-Hydrogéologie | Nov. 1991 | | |
| 63 | II ème Table Ronde sur les Barrages Anti-Sel en Basse Casamance (ISRA) | 12-15 Juin 1985 | | |
| 64 | Ecole Nationale des Cadres Ruraux Propositions de Programmes d'Enseignement - Filière Eaux et Forêts | Déc. 1988 | | |
| 65 | BATIR Une Organisation Décentralisée et Ouvverte aux Partenaires et Clients Séminaire des responsables | ISRA | | |
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APPENDIX II

Inventory List

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT | |
|-----------------------------------|------|----------|----------|------|------------|
| CLAVIER (SN 00703484) | 2500 | 01 | | B | BUREAU 101 |
| MONITEUR VIVITRON (SN 8021748) | 2501 | 01 | | B | |
| BUREAU FRAQUE 6 TIROIRS | 2502 | 01 | | B | |
| WHITE WESTINGHOUSE JK21609139 | 4015 | 01 | | B | |
| U.C (SN 2667451) | 2504 | 01 | | B | |
| CLASSEUR | 4008 | 01 | | B | |
| TABLE | 2114 | 01 | | B | |
| ETAGERE | 4007 | 01 | | B | |
| CHAISE VISITEUR | 075 | 01 | | B | |
| CHAISE VISITEUR | 079 | 01 | | B | |
| BUREAU | 2109 | 01 | | B | |
| CHAISE SALLE DE CONFERENCE | 2137 | 01 | | B | |
| TABLEAU AFFICHAGE | 2164 | 01 | | B | |
| | | | | | |
| U.C. (2667452) | 2505 | 02 | | B | BUREAU 102 |
| ZENITH AIR SN 74330495 | 4033 | 02 | | B | |
| MONITEUR VIVITRON (8021754) | 2507 | 02 | | B | |
| TELEPHONE AT&T | 2508 | 02 | | B | |
| CLAVIER (00201147) | 2509 | 02 | | B | |
| BUREAU MINISTRE | 021 | 02 | | B | |
| ETAGERE | 047 | 02 | | B | |
| FAUTEUIL | 055 | 02 | | B | |
| CHAISE VISITEUR | 072 | 02 | | B | |
| CHAISE VISITEUR | 070 | 02 | | B | |
| COMMODE | 1593 | 02 | | B | |
| COMMODE | 2206 | 02 | | B | |
| CLASSEUR | 2207 | 02 | | B | |
| TABLE ORDINATEUR | 2208 | 02 | | B | |
| COPIEUR XEROX 5317 SN 212294001.5 | 2209 | 02 | | B | |
| ETAGERE | 2210 | 02 | | B | |
| FAX XEROX 7024 | 2510 | 02 | | B | |
| CLASSEUR | 2213 | 02 | | B | |
| COMMODE | 2214 | 02 | | B | |
| COMMODE | 2215 | 02 | | B | |
| CANAPE | 2216 | 02 | | B | |
| CLASSEUR | 2218 | 02 | | B | |
| TABLEAU AFFICHAGE | 2219 | 02 | | B | |
| TABLEAU AFFICHAGE | 2220 | 02 | | B | |
| TRANSFORMATEUR | 2244 | 02 | | B | |
| TABLE ORDINATEUR | 2245 | 02 | | B | |
| | | | | | |
| ZENITH AIR SN U74330498 | 4016 | 03 | | B | BUREAU 103 |
| TABLE | 2510 | 03 | | B | |
| CLASSEUR | 009 | 03 | | B | |
| BUREAU MINISTRE | 017 | 03 | | B | |
| CHAISE VISITEUR | 031 | 03 | | B | |
| ETAGERE | 048 | 03 | | B | |
| FAUTEUIL | 058 | 03 | | B | |
| CHAISE | 2148 | 03 | | B | |
| CLAVIER SN 31030450 | 2170 | 03 | | B | |
| TABLEAU AFFICHAGE | 2172 | 03 | | B | |
| MONITEUR SN AUKKU3500924 | 2373 | 03 | | B | |
| U.C (101293) | 2374 | 03 | | B | |
| ONDULEUR MODEL QME850VA | 2375 | 03 | | B | |
| | | | | | |
| AIRWELL SN U90001406 | 4034 | 04 | | B | BUREAU 104 |
| CLASSEUR | 0011 | 04 | | B | |

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT | |
|----------------------------------|------|----------|----------|------|------------|
| BUREAU | 0018 | 04 | | B | |
| CHAISE VISITEUR | 0030 | 04 | | B | |
| CHAISE | 0034 | 04 | | B | |
| DELL PORTABLE SN 08CX7 | 0194 | 04 | | M | |
| ETAGERE A 36 CASIERS | 2050 | 04 | | B | |
| CASIER A CLEFS | 2051 | 04 | | B | |
| COFFRE FORT | 2217 | 04 | | B | |
| CALCULATRICE CX123 SN 910603 | 2325 | 04 | | B | |
| ONDULEUR MODEL QME850VA | 2350 | 04 | | B | |
| | | | | | |
| ETAGERE FRAQUE | 4009 | 05 | | B | BUREAU 105 |
| WHITE WESTINGHOUSE SN JK02026357 | 4024 | 05 | | B | |
| CHAISE VISITEUR | 082 | 05 | | B | |
| TABLEAU AFFICHAGE | 2163 | 05 | | B | |
| | | | | | |
| IMPRIMANTE APPEL TELEPHONE | 2515 | 06 | | M | BUREAU 106 |
| TELEPHONE AT&T | 2516 | 06 | | B | |
| ZENITH AIR SN U74330391 | 4032 | 06 | | B | |
| BUREAU | 024 | 06 | | B | |
| U.N. EVEREX TEMPO | 196 | 06 | | B | |
| MONITEUR MON 00500-OA | 198 | 06 | | B | |
| TABLE | 2059 | 06 | | B | |
| ONDULEUR MODEL QME850VA | 2060 | 06 | | B | |
| ETAGERE | 2061 | 06 | | B | |
| ETAGERE | 2062 | 06 | | B | |
| CHAISE VISITEUR | 065 | 06 | | B | |
| CHAISE VISITEUR | 066 | 06 | | B | |
| CHAISE SECRETAIRE | 2063 | 06 | | B | |
| CHAISE | 2142 | 06 | | B | |
| TABLE FAX | 2211 | 06 | | B | |
| CLAVIER SN 08432202 | 2351 | 06 | | B | |
| | | | | | |
| U.C SN 2667449 | 2518 | 07 | | B | BUREAU 107 |
| ZENITH AIR SN 474330566 | 4017 | 07 | | B | |
| MONITEUR SN 8021749 | 2519 | 07 | | B | |
| CLASSEUR 4 TIROIRS | 2520 | 07 | | B | |
| CLAVIER SN 00201148 | 2521 | 07 | | B | |
| BUREAU | 0016 | 07 | | B | |
| ETAGERE | 0049 | 07 | | B | |
| FAUTEUIL | 0059 | 07 | | B | |
| TABLE | 0094 | 07 | | B | |
| CHAISE | 0098 | 07 | | B | |
| CHAISE | 0101 | 07 | | B | |
| CHAISE | 2168 | 07 | | B | |
| ETAGERE | 2259 | 07 | | B | |
| BUREAU 6 TIROIRS BOIS FRAQUE | 2402 | 07 | | B | |
| | | | | | |
| APPAREIL TELEPHONE AT&T | 2522 | 08 | | B | BUREAU 108 |
| ETAGERE | 010 | 08 | | B | |
| BUREAU MINISTRE | 020 | 08 | | B | |
| ETAGERE | 046 | 08 | | B | |
| FAUTEUIL | 057 | 08 | | B | |
| CHAISE | 064 | 08 | | B | |
| TABLE | 090 | 08 | | B | |
| ZENITH AIR SN U74330457 | 4035 | 08 | | B | |
| ETAGERE | 2064 | 08 | | B | |
| CLASSEUR | 2067 | 08 | | B | |

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| NOM | REF | POSITION | COMMENTS | ETAT | |
|-------------------------------|------|----------|----------|------|------------|
| CLASSEUR | 2068 | 08 | | B | |
| TABLE | 2115 | 08 | | B | |
| CHAISE | 2121 | 08 | | B | |
| | | | | | |
| PHILCO INTL SN 0870313138 | 4020 | 09 | | B | BUREAU 109 |
| CHAISE DE VISITEUR | 076 | 09 | | B | |
| MONITEUR MON 00500-OA | 197 | 09 | | B | |
| BUREAU | 2032 | 09 | | B | |
| TABLE | 2110 | 09 | | B | |
| CHAISE | 2134 | 09 | | B | |
| VENTILATEUR PLAFONNIER | 2252 | 09 | | B | |
| CLAVIER SN 21658242 | 2379 | 09 | | B | |
| U.C EVEREX TEMPO | 2381 | 09 | | B | |
| | | | | | |
| TABLE ORDINATEUR | 2065 | 10 | | B | BUREAU 110 |
| MONITEUR SN 088830 | 2303 | 10 | | B | |
| U.C. ZEOS 386SX | 2304 | 10 | | B | |
| CLAVIER SN 11398242 | 2306 | 10 | | B | |
| GENERAL ELECTRIC SN AA802388 | 4031 | 10 | | B | |
| CHAISE | 066 | 10 | | B | |
| TABLE | 122 | 10 | | B | |
| TABLEAU | 2069 | 10 | | B | |
| BUREAU MINISTRE | 2070 | 10 | | B | |
| FAUTEUIL | 2071 | 10 | | B | |
| CLASSEUR | 2072 | 10 | | B | |
| | | | | | |
| BUREAU | 023 | 11 | | B | BUREAU 111 |
| ETAGERE | 044 | 11 | | B | |
| ETAGERE | 045 | 11 | | B | |
| CHAISE VISITEUR | 073 | 11 | | B | |
| PHILCO INTL SN 087013183 | 4018 | 11 | | B | |
| CHAISE | 2140 | 11 | | B | |
| CHAISE | 2154 | 11 | | B | |
| TABLE | 2177 | 11 | | B | |
| TABLE BASSE | 2178 | 11 | | B | |
| IMP. LASERJET4 SN JPBV021327 | 2179 | 11 | | B | |
| COMMODE | 2180 | 11 | | B | |
| ONDULEUR MODEL QME850VA | 2182 | 11 | | B | |
| TABLE ORDINATEUR | 2183 | 11 | | B | |
| CLASSEUR | 2184 | 11 | | B | |
| ETAGERE | 2251 | 11 | | B | |
| CLAVIER | 2354 | 11 | | B | |
| MONITEUR SN AOKKU3500957 | 2355 | 11 | | B | |
| U.C. SN 10129345-57298-466 | 2356 | 11 | | B | |
| | | | | | |
| GENERAL ELECTRIC SN AA802386 | 4030 | 12 | | B | BUREAU 112 |
| VENTILATEUR PLAFONNIER | 4006 | 12 | | B | |
| TABLE ORDINATEUR | 2074 | 12 | | B | |
| MONITEUR SN SR063487 | 2361 | 12 | | B | |
| U.C. NOVUS | 2362 | 12 | | B | |
| CLAVIER SN 07039131 | 2364 | 12 | | B | |
| | | | | | |
| CLIMATISEUR G.E. SN DA 650208 | 4029 | 14 | | B | BUREAU 114 |
| CHAISE VISITEUR | 033 | 14 | | B | |
| DELL PORTABLE SN 08C80 | 193 | 14 | | B | |
| COMMODE | 2082 | 14 | | B | |

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| NOM | REF | POSITION | COMMENTS | ETAT | |
|------------------------------------|------|----------|-----------------------|------|------------|
| MONITEUR SN 8021745 | 2525 | 15 | | B | BUREAU 115 |
| U.C. SN 2667450 | 2526 | 15 | | B | |
| GENERAL ELECTRIC SN DF501457 | 4019 | 15 | | B | |
| CLAVIER SN 00714650 | 2527 | 15 | | B | |
| TABLE | 2117 | 15 | | B | |
| TABLE ORDINATEUR | 2174 | 15 | | B | |
| ETAGERE | 2175 | 15 | | B | |
| TABLEAU AFFICHAGE | 2185 | 15 | | B | |
| ETAGERE | 2248 | 15 | | B | |
| SCLEROMETRE PLUS 12 MENBRANES | 2400 | 15 | | B | |
| | | | | | |
| BALANCE WANG 10 KGS | 4061 | 16 | | B | BUREAU 116 |
| BALANCE WANG 10 KGS | 4062 | 16 | | B | |
| BALANCE WANG 10 KGS | 4063 | 16 | | B | |
| MONITEUR ZEOS MODEL 66267 | 203 | 16 | | M | |
| ECRAN DE PROJECTION 145/145 S/PIED | 4057 | 16 | | B | |
| BALANCE WANG 10 KGS | 4064 | 16 | | B | |
| RETROPROJECTEUR LARA | 4058 | 16 | | B | |
| VENTILATEUR PLAFONNIER | 4059 | 16 | | B | |
| SUPPORT TABLE DE DESSIN | 4060 | 16 | | B | |
| FAX AMSTRAD SN 2983K501482 | 103 | 16 | | M | |
| PROJECTEUR | 105 | 16 | | B | |
| ECRAN PROJECTEUR | 106 | 16 | | B | |
| MONITEUR NOVUS SN 063187 | 200 | 16 | | M | |
| FAX AGORIS SN 867836 | 2212 | 16 | DOUBLE IDENTIFICATION | M | |
| ETAGERE FOURNITURE DE BUREAU | 2405 | 16 | | B | |
| ETAGERE FOURNITURE DE BUREAU | 2406 | 16 | | B | |
| MACHINE A ECRIRE | 251 | 16 | | B | |
| | | | | | |
| DAME OPN | 4065 | 17 | | B | BUREAU 117 |
| DENSIOMETRE A MEMBRANE | 4066 | 17 | | B | |
| DENSIOMETRE A MEMBRANE | 4067 | 17 | | B | |
| DENSIOMETRE A MEMBRANE | 4068 | 17 | | B | |
| DENSITOMETRE A MEMBRANE | 4069 | 17 | | B | |
| SERIE DE TAMIS ASTM | 4071 | 17 | | B | |
| SERIE DE TAMIS ASTM | 4072 | 17 | | B | |
| HYDROMETRE | 4073 | 17 | | B | |
| HYDROMETRE | 4085 | 17 | | B | |
| HYDROMETRE | 4086 | 17 | | B | |
| AGITATEUR ELECTRIQUE HAMILTON | 4074 | 17 | | B | |
| WHITE WESTINGHOUSE SN JK34216510 | 4023 | 17 | | B | |
| AGITATEUR SEIVETESTING | 0256 | 17 | | B | |
| TESTING SEIVE | 0257 | 17 | | B | |
| LIMITE ATTERB | 0258 | 17 | | B | |
| EQUIVALENT SABLE | 0259 | 17 | | B | |
| HEAVYDUTY BALANCE 20KG-45IB | 0262 | 17 | | B | |
| TRIPLE BEAM BALANCE | 0265 | 17 | | B | |
| DENSITOMETRE A CONE | 0277 | 17 | | B | |
| DENSITOMETRE A CONE | 0278 | 17 | | B | |
| DENSITOMETRE A CONE | 0279 | 17 | | B | |
| PRESSE MOULE | 0284 | 17 | | B | |
| DENSITOMETRE SEDITECH | 0286 | 17 | | B | |
| ETUVE PM | 0289 | 17 | | B | |
| CHAISE VISITEUR | 0071 | 17 | | B | |
| CHAISE VISITEUR | 0078 | 17 | | B | |
| TABLE BASSE | 0085 | 17 | | B | |
| BUREAU | 0089 | 17 | | B | |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|----------------------------------|------|----------|----------------|------|
| TRANSFORMATEUR | 1673 | 17 | | B |
| BUREAU | 2100 | 17 | | B |
| TABLE | 2118 | 17 | | B |
| CHAISE | 2144 | 17 | | B |
| APPAREILLAGE ANALYSE DENSIMETRIQ | 4069 | 17 | | |
| SCLEROMETRE A BETON | 4070 | 17 | | |
| ENSEMBLE DE GAZ | | 17 | AU NOMBRE DE 4 | |
| BALANCE (SPRING-PLATFORM SCALES) | | 17 | AU NOMBRE DE 7 | |
| RECHAUD A GAZ | 5000 | 17 | | |
| ETAGERE | 2176 | 17 | | B |
| CALCULATRICE DUAL POWER | 2404 | 17 | | B |
| CAISSE ECHANTILLONS | 4052 | 17 | | B |
| CAISSE ECHANTILLONS | 4053 | 17 | | B |
| CAISSE ECHANTILLONS | 4054 | 17 | | B |
| CAISSE ECHANTILLONS | 4055 | 17 | | B |
| DAME OPM | 0283 | 17 | | B |
| MOULE PROCTOR GRAND MODELE | 0303 | 17 | | B |
| MOULE PROCTOR PETIT MODELE | 0304 | 17 | | B |
| | | | | |
| CLASSEUR | 4002 | 18 | | B |
| CLASSEUR | 004 | 18 | | B |
| BUREAU | 025 | 18 | | B |
| CHAISE SECRETAIRE | 2084 | 18 | | B |
| TABLE ORDINATEUR | 2085 | 18 | | B |
| TRANSFORMATEUR | 2086 | 18 | | B |
| ONDULEUR SN J501921280 | 2087 | 18 | | B |
| PHILCO SN 0870313180 | 4026 | | | B |
| COMMODE | 2088 | 18 | | B |
| BUREAU | 4001 | 18 | | B |
| CHAISE | 4003 | 18 | | B |
| ETAGERE | 2257 | 18 | | B |
| ETAGERE | 2258 | 18 | | B |
| TABLEAU D'AFFICHAGE | 2264 | 18 | | B |
| U.C. SN 10129344-87234-466 | 2366 | 18 | | B |
| CLAVIER SN 61531050 | 2367 | 18 | | B |
| TABLEAU D'AFFICHAGE | 2385 | 18 | | B |
| BUREAU 6 TIROIRS BOIS FRAQUE | 2401 | 18 | | B |
| | | | | |
| CAISSE REFLECTEUR | 4037 | 19 | | B |
| CAISSE REFLECTEUR | 4038 | 19 | | B |
| CAISSE REFLECTEUR | 4039 | 19 | | B |
| CHAINE DE 50 M | 4040 | 19 | | B |
| MIRE | 4041 | 19 | | B |
| MIRE | 4042 | 19 | | B |
| MIRE | 4043 | 19 | | B |
| MIRE | 4044 | 19 | | B |
| NIVEAU C30 | 4046 | 19 | | B |
| PORTE REFLECTEUR | 4047 | 19 | | B |
| REFLECTEUR | 4048 | 19 | | B |
| TOPCON GTS-3C TACHEOMETRE | 4049 | 19 | | B |
| TREPIED MINGOLO PRECISION | 4050 | 19 | | B |
| WHITE WESTINGHOUSE SN JK34216514 | 4021 | 19 | | B |
| CHAISE VISITEUR | 0068 | 19 | | B |
| TRANSFORMATEUR | 1585 | 19 | | B |
| BUREAU | 2104 | 19 | | B |
| BUREAU | 2105 | 19 | | B |
| BUREAU | 2106 | 19 | | B |

BUREAU 118

BUREAU 119

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-----------------------------------|------|----------|----------|------|
| CASIER MATERIEL TOPO | 2107 | 19 | | B |
| CHAISE | 2147 | 19 | | B |
| CHAISE | 2153 | 19 | | B |
| TRANSFORMATEUR | 2253 | 19 | | B |
| NIVEAU HILGER WATTS | 2407 | 19 | | B |
| | | | | |
| UNITE CENTRALE TELEPHONE BARPHO | 2559 | 20 | | B |
| GENERAL ELECTRIC SN AA802384 | 4028 | 20 | | B |
| ARMOIRE A CLASSEMENT | 0014 | 20 | | B |
| CHAISE VISITEUR | 0081 | 20 | | B |
| TABLE | 0088 | 20 | | B |
| TABLE | 0093 | 20 | | B |
| TABLE | 0095 | 20 | | B |
| PHOTOCOPIEUR XEROX 5026II | 0110 | 20 | | B |
| RECHAUD ELECTRIQUE | 2007 | 20 | | B |
| COMMUNE | 2078 | 20 | | B |
| MACHINE A RELIURE IMAGE-MAKER 200 | 2081 | 20 | | B |
| MACHINE A RELIURE LAMIREL | 2263 | 20 | | B |
| | | | | |
| CLASSEUR | 008 | 21 | | B |
| TE (REGLE DESSIN) | 124 | 21 | | B |
| TRANSFORMATEUR | 183 | 21 | | B |
| TABLE DIGITALISATEUR | 2091 | 21 | | B |
| ONDULEUR MODEL QME850VA | 4051 | 21 | | B |
| CLAVIER SN 61531054 | 2092 | 21 | | B |
| G.E. SN DF501403 | 4022 | 21 | | B |
| TABLE TIREUSE PLAN | 2094 | 21 | | B |
| TIREUSE DE PLAN | 2095 | 21 | | B |
| TABLE ORDINATEUR | 2265 | 21 | | B |
| MONITEUR SN AOKKU3500936 | 2370 | 21 | | B |
| U.C. SN 10129342-87240-466 | 2371 | 21 | | B |
| | | | | |
| MOTO HONDA CH# 5419028 | | 22 | | B |
| MOTO YAMAHA SN 025293 | | 22 | | B |
| MOTO YAMAHA SN 025287 | | 22 | | B |
| MOTO YAMAHA SN 025303 | | 22 | | B |
| CHARRUES A DISQUE RAZOL | | 22 | | B |
| MOTO YAMAHA 925282 | | 22 | | B |
| TRACTEUR JOHN DEERE 768638L | | 22 | | B |
| REMORQUE GILIBERT RE 450BS | | 22 | | B |
| TRACTEUR JOHN DEERE 768488L | | 22 | | B |
| MOTO YAMAHA SN 025294 | | 22 | | B |
| MOTO YAMAHA SN 025301 | | 22 | | B |
| MOTO YAMAHA SN 025299 | | 22 | | B |
| MOTO YAMAHA SN 025307 | | 22 | | B |
| MOTO YAMAHA SN 025274 | | 22 | | B |
| PHILCO INTL SN 8701313161 | 4025 | 22 | | B |
| MOTO YAMAHA SN 025264 | | 22 | | B |
| MOTO HONDA CH# 5419028 | | 22 | | B |
| MOTO YAMAHA SN 025263 | | 22 | | B |
| MOTO YAMAHA SN 025261 | | 22 | | B |
| CHARRUE A DISQUES RAZOL | | 22 | | B |
| MOTO YAMAHA SN 025280 | | 22 | | B |
| MOTO HONDA CH# 5419027 | | 22 | | B |
| MOTO YAMAHA SN 025262 | | 22 | | B |
| CLASSEUR | 0005 | 22 | | B |
| CLASSEUR | 0013 | 22 | | B |

BUREAU 121

BUREAU 122

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| NOM | REF | POSITION | COMMENTS | ETAT |
|--------------------------------|--------|----------|----------|------|
| BUREAU | 0022 | 22 | | B |
| ETAGERE | 0043 | 22 | | B |
| FAUTEUIL | 0056 | 22 | | B |
| CHAISE VISITEUR | 0069 | 22 | | B |
| CHAISE | 0074 | 22 | | B |
| MOBYLETTE 10496024 | 0011 | 22 | | B |
| ETAGERE FRAQUE | 2261 | 22 | | B |
| MOBYLETTE 10496062 | 0024 | 22 | | B |
| TOYOTA PICKUP SN 0004866 | 5726TT | 22 | | B |
| TOYOTA PICKUP SN 0003754 | 5727TT | 22 | | B |
| MITSUBISHI WAGON SN LJ 400916 | 6795TT | 22 | | B |
| MITSUBISHI WAGON SN LJ 400913 | 6796TT | 22 | | B |
| MITSUBISHI WAGON SN LJ 400911 | 6797TT | 22 | | B |
| MITSUBISHI WAGON SN LJ 400906 | 6798TT | 22 | | B |
| MITSUBISHI WAGON SN LJ 400903 | 6799TT | 22 | | B |
| MITSUBISHI PICKUP SN LP 00926 | 6800TT | 22 | | B |
| MITSUBISHI PICKUP SN LP 00924 | 6801TT | 22 | | B |
| MITSUBISHI PICKUP SN LP 00912 | 6802TT | 22 | | B |
| COMMODE | 0703 | 22 | | B |
| TOYOTA PICKUP SN LN 000106 | 9128TT | 22 | | B |
| TOYOTA PICK UP SN 0101048 | 9344TT | 22 | | B |
| TOYOTA PICK UP SN 0101095 | 9345TB | 22 | | B |
| TOYOTA PICK UP SN 0101095 | 9345TT | 22 | | B |
| BICYCLETTE | DIAO | 22 | | B |
| BICYCLETTE | FAYE | 22 | | B |
| BICYCLETTE | MANSA | 22 | | B |
| BICYCLETTE | SANE | 22 | | B |
| BICYCLETTE | SECK | 22 | | B |
| | | | | |
| CLASSEUR | 006 | 23 | | B |
| CLASSEUR | 007 | 23 | | B |
| CASIER PLAN | 083 | 23 | | B |
| TIREUSE DE PLAN | 129 | 23 | | B |
| CASIER PLANS | 2098 | 23 | | B |
| CASIER PLANS | 2099 | 23 | | B |
| | | | | |
| AIRWELL SN 090001404 | 4027 | 24 | | B |
| ETAGERE FRAQUE | 4056 | 24 | | B |
| CLASSEUR | 003 | 24 | | B |
| CHAISE VISITEUR | 067 | 24 | | B |
| CHAISE VISITEUR | 077 | 24 | | B |
| CHAISE | 080 | 24 | | B |
| TABLE SALLE CONFERENCE | 2111 | 24 | | B |
| CHAISE | 2141 | 24 | | B |
| TABLEAU D'AFFICHAGE | 2167 | 24 | | B |
| BUREAU | 2260 | 24 | | B |
| TABLE BASSE | 598 | 24 | | B |
| | | | | |
| CASIER MURAL | 4010 | CL | | B |
| CASIER MURAL | 4005 | CL | | B |
| TABLE BASSE | 4004 | CL | | B |
| TRANSFORMATEUR | 181 | CL | | B |
| COMMODE | 2056 | CL | | B |
| LASERJET 4 SN JPBV022323 | 2057 | CL | | B |
| IMPRIMANTE LASERJET 3 | 207 | CL | | B |
| IMP. LASERJETIII SN 3001A84509 | 208 | CL | | B |
| TABLE SALLE DE CONFERENCE | 2120 | CL | | B |

BUREAU 123

BUREAU 124

COULOIRS

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| NOM | REF | POSITION | COMMENTS | ETAT | |
|--------------------------------|------|----------|----------|------|--------------|
| CHAISE | 2125 | CL | | B | |
| PANNEAU AFFICHAGE | 2383 | CL | | B | |
| PANNEAU AFFICHAGE | 2384 | CL | | B | |
| TABLE BASSE | 694 | CL | | | |
| TABLE | 119 | MV | | B | DIAGNE |
| SOMMIER GM | 1600 | MV | | B | |
| SOMMIER PM | 412 | MV | | B | |
| TABLE BASSE | 495 | MV | | B | |
| SOMMIER PM | 558 | MV | | B | |
| MATELAS GM | 607 | MV | | B | |
| MATELAS PM | 608 | MV | | B | |
| MATELAS GM | 609 | MV | | B | |
| MATELAS PM | 610 | MV | | B | |
| COMMODE | 663 | MV | | B | |
| COMMODE | 682 | MV | | B | |
| SOMMIER GM | 699 | MV | | B | |
| CANAPE 2 PLACES | 707 | MV | | B | |
| CANAPE 3 PLACES | 709 | MV | | B | |
| CASQUE LAMPE CHEVET | 3539 | EV | | B | E. VERLINDEN |
| MIROIR | 757 | EV | | B | |
| TETE DE LIT | 3560 | EV | | B | |
| TETE DE LIT | 3561 | EV | | B | |
| TETE DE LIT | 3563 | EV | | B | |
| TETE DE LIT | 3562 | EV | | B | |
| ETAGERE | 220 | EV | | B | |
| ETAGERE | 228 | EV | | B | |
| ETAGERE DOREE | 733 | EV | | B | |
| FILTRE A EAU | 3540 | EV | | B | |
| VAISSELIER | 2283 | EV | | B | |
| LAMPE DE CHEVET | 748 | EV | | B | |
| COMMODE | 742 | EV | | B | |
| COMMODE | 3505 | EV | | M | |
| CLIMATISEUR G.E SN 43DA6500165 | 3530 | EV | | B | |
| CHAUFFE EAU ARISTON | 3541 | EV | | B | |
| CLIMATISEUR G.E SN 43DA650125 | 3531 | EV | | B | |
| LIT LOCAL | 3542 | EV | | B | |
| LAMPE DE CHEVET | 3543 | EV | | M | |
| CUISINIERE RHOYXON | 3544 | EV | | B | |
| CHAISE TABLE A MANGER | 3545 | EV | | B | |
| CHAUFFE EAU | 3546 | EV | | B | |
| TABLE JARDIN | 3547 | EV | | M | |
| FAUTEUIL | 3548 | EV | | B | |
| CLIMATISEUR G.E SN 43DA650138 | 3532 | EV | | B | |
| CLIMATISEUR W.W SN JK21068995 | 3533 | EV | | B | |
| CASQUE LAMPE CHEVET | 3549 | EV | | B | |
| CHAISE TABLE A MANGER | 089 | EV | | B | |
| CHAISE TABLE A MANGER | 090 | EV | | B | |
| CHAISE TABLE A MANGER | 091 | EV | | B | |
| CHAISE TABLE A MANGER | 092 | EV | | B | |
| CHAISE TABLE A MANGER | 093 | EV | | B | |
| CHAISE TABLE A MANGER | 094 | EV | | B | |
| COMMODE | 173 | EV | | B | |
| COMMODE | 2235 | EV | | B | |
| BUREAU | 2277 | EV | | B | |
| COMMODE | 2278 | EV | | B | |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|---------------------------------|------|----------|----------|------|
| MATELAS | 2279 | EV | | B |
| SOMMIER | 2280 | EV | | B |
| VAISSELIER | 2283 | EV | | B |
| SOMMIER | 2285 | EV | | B |
| CADRE DE LIT | 2286 | EV | | B |
| TAPIS | 2287 | EV | | B |
| COMMODE | 2288 | EV | | B |
| COMMODE | 2289 | EV | | B |
| MATELAS EPONGE | 2290 | EV | | B |
| LAMPE DE CHEVET | 265 | EV | | B |
| MATELAS | 339 | EV | | B |
| CONGELATEUR | 532 | EV | | B |
| CHAISE TABLE A MANGER | 623 | EV | | M |
| CHAISE TABLE A MANGER | 626 | EV | | M |
| CHAISE DE JARDIN | 711 | EV | | B |
| CHAISE DE JARDIN | 712 | EV | | B |
| CHAISE DE JARDIN | 713 | EV | | B |
| CHAISE JARDIN | 714 | EV | | B |
| CHAISE DE JARDIN | 715 | EV | | B |
| CHAISE DE JARDIN | 716 | EV | | B |
| TABLE DE JARDIN | 718 | EV | | B |
| CHAISE PLIANTE | 719 | EV | | B |
| CHAISE PLIANTE | 720 | EV | | B |
| CHAISE PLIANTE | 721 | EV | | B |
| CHAISE PLIANTE | 722 | EV | | B |
| MACHINE A LAVER | 723 | EV | | B |
| SECHOIR ELECTRIQUE | 724 | EV | | B |
| ETAGERE | 726 | EV | | B |
| TABLE A MANGER | 732 | EV | | B |
| ETAGERE DOREE | 733 | EV | | B |
| POUFFE | 735 | EV | | B |
| POUFFE | 736 | EV | | B |
| POUFFE | 737 | EV | | B |
| POUFFE | 738 | EV | | B |
| POUFFE | 739 | EV | | B |
| POUFFE | 740 | EV | | B |
| POUFFE | 741 | EV | | B |
| POUFFE | 742 | EV | | B |
| COMMODE | 743 | EV | | B |
| COMMODE | 745 | EV | | B |
| MIROIR | 746 | EV | | B |
| COMMODE | 750 | EV | | B |
| REFRIGERATEUR | 753 | EV | | B |
| MATELAS | 613 | EV | | B |
| ETAGERE LOCALE | 3564 | EV | | B |
| COMMODE | 755 | EV | | B |
| COMMODE | 756 | EV | | B |
| COMMODE | 759 | EV | | B |
| LAMPE DE CHEVET | 767 | EV | | B |
| LAMPE DE CHEVET | 768 | EV | | B |
| CLIMATISEUR ZENITH SN U74330266 | 3534 | EV | | B |
| BAHUT | 2275 | EV | | B |
| COMMODE | 3505 | EV | | B |
| ETAGERE | 3506 | EV | | B |
| LAMPE DE CHEVET | 748 | EV | | B |
| | | | | |
| CHAISE JARDIN PLASTIQUE | 3509 | GG | | B |

G. GENDARME

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------|------|----------|--------------|------|
| CHAISE JARDIN PLASTIQUE | 159 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 151 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 152 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 154 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 153 | GG | | B |
| TRANSFORMATEUR GM | 824 | GG | | B |
| MATELAS | 338 | GG | | B |
| CASQUE LAMPE CHEVET | 3517 | GG | | B |
| CLIMATISEUR G.E SN 43DA650034 | 3520 | GG | | B |
| CLIMATISEUR W.W SN JK34216580 | 3521 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 3510 | GG | | B |
| TABLE BASSE | 3535 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 3511 | GG | | B |
| CHAISE JARDIN PLASTIQUE | 3512 | GG | | B |
| FILTRE E EAU | 3513 | GG | | B |
| TETE DE LIT | 3514 | GG | | B |
| TAPIS SALON | 076 | GG | | B |
| CHAUFFE EAU | 3566 | GG | | B |
| COMMODE | 3567 | GG | MAUVAIS ETAT | M |
| ARMOIRE | 001 | GG | | B |
| TABLE | 450 | GG | | B |
| LAMPE DE CHEVET | 275 | GG | | B |
| TABLE | 502 | GG | | B |
| SOMMIER | 053 | GG | | B |
| FAUTEUIL | 234 | GG | | B |
| COMMODE | 608 | GG | | B |
| COMMODE | 3515 | GG | | B |
| ASPIRATEUR | 3516 | GG | | B |
| CASQUE LAMPE CHEVET | 3518 | GG | | B |
| CASQUE LAMPE CHEVET | 3519 | GG | | B |
| CLIMATISEUR G.E SN AA802140 | 3522 | GG | | B |
| CLIMATISEUR G.E SN 43DA650050 | 3524 | GG | | B |
| CLIMATISEUR P.I SN 0870312905 | 3523 | GG | | B |
| VENTILATEUR PLAFONNIER | 3536 | GG | | B |
| VENTILATEUR PIED | 3537 | GG | | B |
| VENTILATEUR PLAFONNIER | 3538 | GG | | B |
| CONGELATEUR | 021 | GG | | B |
| CUISINIERE | 025 | GG | | B |
| MACHINE A LAYER | 033 | GG | | B |
| REFRIGERATEUR | 039 | GG | | B |
| MATELAS | 052 | GG | | B |
| BUREAU | 3504 | GG | | B |
| SOMMIER | 053 | GG | | B |
| BUREAU | 055 | GG | | B |
| CANAPE | 082 | GG | | B |
| CANAPE | 087 | GG | | B |
| CHAISE TABLE A MANGER | 115 | GG | | B |
| CHAISE TABLE A MANGER | 123 | GG | | B |
| CHAISE TABLE A MANGER | 129 | GG | | B |
| CHAISE TABLE A MANGER | 130 | GG | | B |
| CHAISE TABLE A MANGER | 132 | GG | | B |
| CHAISE TABLE A MANGER | 143 | GG | | B |
| COMMODE | 176 | GG | | B |
| COMMODE | 185 | GG | | B |
| COMMODE | 186 | GG | | B |
| COMMODE | 202 | GG | | B |
| ETAGERE | 225 | GG | | B |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|--------------------------------|------|----------|----------|------|
| FAUTEUIL | 243 | GG | | B |
| FAUTEUIL | 249 | GG | | B |
| FAUTEUIL | 255 | GG | | B |
| LAMPE DE CHEVET | 276 | GG | | B |
| LAMPE DE CHEVET | 277 | GG | CASSE | B |
| LAMPE DE CHEVET | 278 | GG | | B |
| LAMPE DE CHEVET | 279 | GG | | B |
| LAMPE DE CHEVET | 280 | GG | | B |
| LAMPE DE CHEVET | 296 | GG | | B |
| LAMPE DE CHEVET | 297 | GG | | B |
| MATELAS | 333 | GG | | B |
| MATELAS | 337 | GG | | B |
| MATELAS | 362 | GG | | B |
| MIROIR | 392 | GG | | B |
| SOMMIER | 422 | GG | | B |
| SOMMIER | 423 | GG | | B |
| SOMMIER | 440 | GG | | B |
| TABLE | 456 | GG | | B |
| TABLE | 462 | GG | | B |
| TABLE | 471 | GG | | B |
| TABLE | 492 | GG | | B |
| TABLE | 501 | GG | | B |
| VAISSELIER | 531 | GG | | B |
| COMMODE | 604 | GG | | B |
| COMMODE | 665 | GG | | B |
| CHAISE TABLE A MANGER | 804 | GG | | B |
| VAISSELIER | 805 | GG | | B |
| VAISSELIER | 806 | GG | | B |
| COMMODE | 807 | GG | | B |
| MATELAS | 812 | GG | | B |
| ETAGERE | 814 | GG | | B |
| MATELAS | 815 | GG | | B |
| TABLE | 816 | GG | | B |
| FAUTEUIL | 817 | GG | | B |
| MIROIR | 818 | GG | | B |
| COMMODE | 820 | GG | | B |
| BUREAU | 821 | GG | | B |
| BUREAU | 822 | GG | | B |
| CHAUFFE EAU | 823 | GG | | B |
| TRANSFORMATEUR | 824 | GG | | B |
| TABLE | 826 | GG | | B |
| COMMODE | 827 | GG | | B |
| TABLE | 786 | GG | | B |
| COMMODE | 026 | GG | | B |
| | | | | |
| SOMMIER | 1599 | MV | | B |
| SOMMIER | 1603 | MV | | B |
| SOMMIER | 1605 | MV | | B |
| MATELAS | 319 | MV | | B |
| MATELAS | 347 | MV | | B |
| MATELAS | 559 | MV | | B |
| MATELAS | 687 | MV | | B |
| MATELAS | 701 | MV | | B |
| | | | | |
| PARATONNERRE ATMOSPHERIQUE PUL | | IS | | B |
| | | | | |
| CLIMATISEUR G.E SN 43DA650212 | | JG | | B |

INSPECTEURS

J. GOULD

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INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------|------|----------|-------------|------|
| BUREAU PM | | JG | | B |
| CLIMATISEUR G.E SN AA802382 | | JG | | B |
| CUISINIERE | | JG | | B |
| CLIMATISEUR G.E SN 43DA650015 | | JG | | B |
| CHAISE JARDIN PLASTIQUE | | JG | | B |
| COMMODE | | JG | | B |
| CLIMATISEUR W.W SN JK21608980 | | JG | | B |
| FILTRE A EAU | | JG | | B |
| SUPPORT LIT EN FER | | JG | | B |
| CLIMATISEUR G.E SN 43DA650161 | | JG | | B |
| ETAGERE DOREE | | JG | | B |
| SUPPORT LIT EN FER GM | | JG | | B |
| SUPPORT LIT EN FER GM | | JG | | B |
| SUPPORT LIT EN FER PM | | JG | | B |
| CLIMATISEUR G.E SN 43DA650160 | | JG | | B |
| TABLE JARDIN | | JG | | B |
| TETE DE LIT GM | | JG | | B |
| TETE DE LIT PM | | JG | | B |
| TETE DE LIT GM | | JG | | B |
| TETE DE LIT PM | | JG | | B |
| TABLE BASSE DOREE | | JG | | B |
| CHAISE JARDIN PLASTIQUE | | JG | | B |
| CLIMATISEUR W.W SN JK34215941 | | JG | | B |
| CHAISE JARDIN PLASTIQUE | | JG | | B |
| TRANSFORMATUEUR | | JG | | B |
| CHAISE JARDIN PLASTIQUE | | JG | | B |
| ARMOIRE | 001 | JG | | B |
| CUISINIERE | 007 | JG | | B |
| REFRIGERATEUR | 009 | JG | | B |
| MATELAS | 050 | JG | | B |
| CHAISE TABLE A MANGER | 109 | JG | | B |
| CHAISE TABLE A MANGER | 110 | JG | | B |
| CHAISE TABLE A MANGER | 112 | JG | | B |
| CHAISE TABLE A MANGER | 114 | JG | | B |
| COMMODE | 178 | JG | | B |
| ETAGERE | 223 | JG | | B |
| CADRE DE LIT | 2237 | JG | | B |
| COMMODE | 2238 | JG | | B |
| LAMPE DE CHEVET | 2239 | JG | | B |
| LAMPE DE CHEVET | 2241 | JG | | B |
| TAPIS | 2242 | JG | | B |
| COMMODE | 2242 | JG | | B |
| LAMPE DE CHEVET | 262 | JG | | B |
| LAMPE DE CHEVET | 269 | JG | | B |
| MATELAS | 365 | JG | | B |
| MATELAS | 366 | JG | | B |
| SOMMIER | 414 | JG | | B |
| SOMMIER | 415 | JG | | B |
| SOMMIER | 443 | JG | | B |
| SOMMIER | 443 | JG | | B |
| TABLE A MANGER | 449 | JG | | B |
| TABLE A MANGER | 457 | JG | | B |
| TABLE A MANGER | 464 | JG | | B |
| TABLE A MANGER | 465 | JG | | B |
| COMMODE | 467 | JG | | B |
| COMMODE | 468 | JG | | B |
| TABLE BASSE | 494 | JG | VERRE CASSE | M |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------|------|----------|-------------|------|
| TABLE A MANGER | 503 | JG | | B |
| TABLE A MANGER | 504 | JG | | B |
| FAUTEUIL | 505 | JG | | B |
| CANAPE | 506 | JG | | B |
| CANAPE | 507 | JG | | B |
| CANAPE | 508 | JG | | B |
| CANAPE | 509 | JG | | B |
| TABLE BASSE DOREE | 512 | JG | VERRE CASSE | M |
| LAMPE DE CHEVET | 513 | JG | | B |
| CONGELATEUR | 515 | JG | | B |
| MIROIR | 518 | JG | | B |
| MIROIR | 522 | JG | | B |
| COMMODE | 525 | JG | | B |
| COMMODE | 526 | JG | | B |
| COMMODE | 528 | JG | | B |
| FAUTEUIL | 529 | JG | | B |
| COMMODE | 532 | JG | | B |
| MIROIR | 536 | JG | | B |
| COMMODE | 537 | JG | | B |
| COMMODE | 541 | JG | | B |
| SOMMIER | 542 | JG | | B |
| MATELAS | 543 | JG | | B |
| MATELAS | 547 | JG | | B |
| ETAGERE | 548 | JG | | B |
| SOMMIER | 550 | JG | | B |
| MATELAS | 551 | JG | | B |
| CADRE DE LIT | 552 | JG | | B |
| CADRE DE LIT | 553 | JG | | B |
| CADRE DE LIT | 554 | JG | | B |
| CADRE DE LIT | 555 | JG | | B |
| CHAISE TABLE A MANGER | 556 | JG | | B |
| ASPIRATEUR | 560 | JG | | B |
| LAMPE DE CHEVET | 668 | JG | | B |
| MACHINE A LAVER | 677 | JG | | B |
| SECHOIR ELECTRIQUE | 678 | JG | | B |
| LAMPE DE CHEVET | 684 | JG | | B |
| CHAISE TABLE A MANGER | 829 | JG | | B |
| CHAISE TABLE A MANGER | 830 | JG | | B |
| VAISSELIER | 831 | JG | | B |
| | | | | |
| TRANSFORMATEUR 220/110 | 3550 | LH | | B |
| MATELAS | 334 | LH | | B |
| MATELAS | 336 | LH | | B |
| MATELAS | 335 | LH | | B |
| FAUTEUIL | 240 | LH | | B |
| TETE DE LIT | 803 | LH | | B |
| TABLE BOIS ROUGE | 799 | LH | | B |
| TRANSFORMATEUR 220/110 | 3551 | LH | | B |
| CLIMATISEUR W.W SN JK34216620 | 3529 | LH | | B |
| TRANSFORMATEUR VA 1500 | 3553 | LH | | B |
| CLIMATISEUR G.E SN 43DA650159 | 3528 | LH | | B |
| CLIMATISEUR G.E SN 43DA650122 | 3527 | LH | | B |
| TABLE JARDIN PLASTIQUE | 3554 | LH | | B |
| CLIMATISEUR G.E SN 43DA650024 | 3525 | LH | | B |
| CHAISE JARDIN PLASTIQUE | 3555 | LH | | B |
| CHAISE JARDIN PLASTIQUE | 164 | LH | | B |
| CHAISE JARDIN PLASTIQUE | 163 | LH | | B |

L. HALDIN

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------|------|----------|----------|------|
| CHAISE JARDIN PLASTIQUE | 534 | LH | | B |
| CHAISE JARDIN PLASTIQUE | 3556 | LH | | B |
| CHAISE JARDIN PLASTIQUE | 3557 | LH | | B |
| BAHUT | 012 | LH | | B |
| BAHUT | 013 | LH | | B |
| BAHUT | 014 | LH | | B |
| BAHUT | 015 | LH | | B |
| ASPIRATEUR | 016 | LH | | B |
| CHAUFFE EAU | 019 | LH | | B |
| CUISINIERE | 024 | LH | | B |
| FILTRE A EAU | 675 | LH | | B |
| MACHINE A LAVER | 031 | LH | | B |
| VAISSELIER | 032 | LH | | B |
| REFRIGERATEUR | 038 | LH | | B |
| CONGELATEUR | 3500 | LH | | B |
| BUREAU | 3501 | LH | | B |
| BUREAU | 3502 | LH | | B |
| CANAPE | 073 | LH | | B |
| COMMODE | 175 | LH | | B |
| TAPIS | 3552 | LH | | B |
| CANAPE | 074 | LH | | B |
| CANAPE | 081 | LH | | B |
| CHAISE TABLE A MANGER | 116 | LH | | B |
| CHAISE TABLE A MANGER | 117 | LH | | B |
| CHAISE TABLE A MANGER | 118 | LH | | B |
| CHAISE TABLE A MANGER | 119 | LH | | B |
| CHAISE TABLE A MANGER | 120 | LH | | B |
| CHAISE TABLE A MANGER | 121 | LH | | B |
| CHAISE TABLE A MANGER | 122 | LH | | B |
| CHAISE TABLE A MANGER | 3507 | LH | | B |
| CHAISE TABLE A MANGER | 123 | LH | | B |
| CHAISE TABLE A MANGER | 124 | LH | | B |
| CHAISE TABLE A MANGER | 125 | LH | | B |
| CLIMATISEUR G.E SN 43DA650168 | 3526 | LH | | B |
| COMMODE | 180 | LH | | B |
| COMMODE | 181 | LH | | B |
| COMMODE | 182 | LH | | B |
| COMMODE | 3572 | LH | | B |
| COMMODE | 183 | LH | | B |
| COMMODE | 184 | LH | | B |
| ETAGERE | 222 | LH | | B |
| ETAGERE | 224 | LH | | B |
| FAUTEUIL | 3570 | LH | | B |
| FAUTEUIL | 242 | LH | | B |
| LAMPE DE CHEVET | 271 | LH | CASSE | M |
| LAMPE DE CHEVET | 274 | LH | | B |
| LAMPE DE CHEVET | 287 | LH | | B |
| LAMPE DE CHEVET | 288 | LH | CASSE | M |
| LAMPE DE CHEVET | 289 | LH | | B |
| LAMPE DE CHEVET | 290 | LH | | B |
| LAMPE DE CHEVET | 291 | LH | | B |
| MATELAS | 2279 | LH | | B |
| MATELAS | 334 | LH | | B |
| MATELAS | 335 | LH | | B |
| MATELAS | 336 | LH | | B |
| MIRROIR | 375 | LH | | B |
| SOMMIER | 417 | LH | | B |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-----------------------|------|----------|----------|------|
| SOMMIER | 418 | LH | | B |
| SOMMIER | 419 | LH | | B |
| SOMMIER | 420 | LH | | B |
| SOMMIER | 421 | LH | | B |
| SOMMIER | 441 | LH | | B |
| TABLE | 451 | LH | | B |
| TABLE | 452 | LH | | B |
| TABLE | 453 | LH | | B |
| TABLE | 454 | LH | | B |
| MATELAS | 463 | LH | | B |
| CHAUFFE EAU | 3568 | LH | | B |
| CHAUFFE EAU | 018 | LH | | B |
| FILTRE A EAU | 3569 | LH | | B |
| TABLE | 469 | LH | | B |
| TABLE | 500 | LH | | B |
| VAISSELIER | 528 | LH | | B |
| VAISSELIER | 529 | LH | | B |
| TABLE | 786 | LH | | B |
| LAMPE DE CHEVET | 788 | LH | | B |
| LAMPE DE SALON | 3508 | LH | | M |
| MIROIR | 791 | LH | | B |
| MATELAS | 792 | LH | | B |
| MATELAS | 793 | LH | | B |
| TETE DE LIT | 794 | LH | | B |
| TETE DE LIT | 795 | LH | | B |
| TETE DE LIT | 796 | LH | | B |
| TETE DE LIT | 797 | LH | | B |
| MIROIR | 798 | LH | | B |
| TABLE | 789 | LH | | B |
| TABLE | 802 | LH | | B |
| EHELLE | 804 | LH | | B |
| COMMODE | 179 | LH | | B |
| MIROIR | 800 | LH | | B |
| MIROIR | 372 | LH | | B |
| MIROIR | 798 | LH | | B |
| CHAISE | 3571 | LH | | B |
| ARMOIRE | 693 | LH | | B |
| TABLE | 801 | LH | | B |
| | | | | |
| COMMODE | 4088 | MP | | B |
| COMMODE | 1589 | MP | | B |
| COMMODE | 1591 | MP | | B |
| CHAISE TABLE A MANGER | 2101 | MP | | B |
| CHAISE TABLE A MANGER | 2102 | MP | | B |
| CONGELATEUR | 2104 | MP | | B |
| CUISINIERE | 2105 | MP | | B |
| TABLE DE SALON LOCAL | 2185 | MP | | B |
| CHAISE PLIANTE LOCAL | 2186 | MP | | B |
| CHAISE PLIANTE LOCAL | 2187 | MP | | B |
| CHAISE PLIANTE LOCAL | 2188 | MP | | B |
| CHAISE PLIANTE LOCAL | 2189 | MP | | B |
| TABLE A MANGER | 2190 | MP | | B |
| CHAISE TABLE A MANGER | 2191 | MP | | B |
| CHAISE TABLE A MANGER | 2192 | MP | | B |
| CHAISE TABLE A MANGER | 2193 | MP | | B |
| CHAISE TABLE A MANGER | 2194 | MP | | B |
| VENTILATEUR | 2195 | MP | | B |

MAISON PASSAGE

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------------|------|----------|----------|------|
| LIT LOCAL | 2196 | MP | | B |
| VENTILATEUR | 2197 | MP | | B |
| VENTILATEUR | 2199 | MP | | B |
| MATELAS EPONGE | 612 | MP | | B |
| MATELAS EPONGE | 4090 | MP | | B |
| MATELAS EPONGE | 614 | MP | | B |
| LIT LOCAL | 629 | MP | | B |
| LIT LOCAL | 631 | MP | | B |
| | | | | |
| CLIMATISEUR ZENITH AIR SN U74330483 | 4095 | MV1 | | M |
| TABLE BASSE DOREE | 3601 | MV1 | | M |
| VENTILATEUR PLAFONNIER | 3603 | MV1 | | B |
| LAMPE DE CHEVET | 3596 | MV1 | | M |
| TABLE BASSE DOREE | 3602 | MV1 | | M |
| CASQUE LAMPE CHEVET | 3597 | MV1 | | B |
| CASQUE LAMPE CHEVET | 3598 | MV1 | | B |
| CASQUE LAMPE CHEVET | 3599 | MV1 | | B |
| CASQUE LAMPE CHEVET | 3599 | MV1 | | B |
| CASQUE LAMPE CHEVET | 3605 | MV1 | | B |
| CHAUFFE EAU | 3594 | MV1 | | B |
| CHAUFFE EAU | 3595 | MV1 | | M |
| RECHAUD ELECTRIQUE | 3604 | MV1 | | M |
| ASPIRATEUR | 3600 | MV1 | | B |
| ASPIRATEUR | 012 | MV1 | | B |
| ASPIRATEUR | 017 | MV1 | | B |
| COMMODE | 0177 | MV1 | | B |
| CUISINIERE | 022 | MV1 | | M |
| MACHINE A LAVER | 030 | MV1 | | M |
| MIROIR | 0368 | MV1 | | B |
| MIROIR | 0371 | MV1 | | B |
| MIROIR | 0374 | MV1 | | B |
| VAISSELIER | 0516 | MV1 | | B |
| COMMODE | 0517 | MV1 | | B |
| CONGELATEUR G.E | 2030 | MV1 | | M |
| TETE DE LIT | 3590 | MV1 | | B |
| TETE DE LIT | 3589 | MV1 | | B |
| TETE DE LIT | 3588 | MV1 | | B |
| TETE DE LIT | 3587 | MV1 | | B |
| TETE DE LIT | 3586 | MV1 | | B |
| TETE DE LIT | 3585 | MV1 | | B |
| TETE DE LIT | 3584 | MV1 | | B |
| TETE DE LIT | 3583 | MV1 | | B |
| ETAGERE | 0580 | MV1 | | B |
| COMMODE | 533 | MV1 | | B |
| COMMODE | 0581 | MV1 | | B |
| COMMODE | 0582 | MV1 | | B |
| MIROIR | 0587 | MV1 | | B |
| TABLE A MANGER | 0661 | MV1 | | B |
| ETAGERE | 0666 | MV1 | | B |
| REFRIGERATEUR PHILCO | 0671 | MV1 | | M |
| CONGELATEUR G.E | 0677 | MV1 | | M |
| COMMODE | 0682 | MV1 | | B |
| TABLE BASSE | 0697 | MV1 | | B |
| MIROIR | 1561 | MV1 | | B |
| MIROIR | 1562 | MV1 | | B |
| MIROIR | 1563 | MV1 | | B |
| MIROIR | 1566 | MV1 | | B |

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| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------------------|------|----------|---------------------------------|------|
| RECHAUD ELECTRIQUE | 173 | MV1 | | M |
| RECHAUD ELECTRIQUE | 175 | MV1 | | M |
| MIROIR | 2003 | MV1 | | B |
| BATTANT ARMOIR | 2004 | MV1 | | B |
| VAISSELIER | 2005 | MV1 | | B |
| PULVERISATEUR | 2009 | MV1 | | B |
| COMMODE | 201 | MV1 | | B |
| MACHINE A LAVER | 2013 | MV1 | | M |
| MACHINE A LAVER | 2014 | MV1 | | M |
| MACHINE A LAVER | 2015 | MV1 | | M |
| MACHINE A LAVER | 2016 | MV1 | | M |
| CUISINIERE | 2017 | MV1 | | M |
| CUISINIERE | 2018 | MV1 | | M |
| CUISINIERE | 2019 | MV1 | | M |
| CUISINIERE | 2020 | MV1 | | M |
| CUISINIERE | 2021 | MV1 | | M |
| MACHINE A SECHER | 2022 | MV1 | | M |
| MACHINE A SECHER | 2023 | MV1 | | M |
| MACHINE A SECHER | 2024 | MV1 | | M |
| REFRIGERATEUR G.E | 2025 | MV1 | | M |
| REFRIGERATEUR G.E | 2026 | MV1 | | M |
| REFRIGERATEUR G.E | 2027 | MV1 | | M |
| REFRIGERATEUR G.E | 2028 | MV1 | | M |
| REFRIGERATEUR G.E | 2029 | MV1 | | M |
| CONGELATEUR G.E | 2030 | MV1 | | M |
| CONGELATEUR | 2031 | MV1 | | M |
| EQUIPEMENT RADIO | 2036 | MV1 | | B |
| CONTREPOIDS TRACTEUR | 2038 | MV1 | | B |
| CONTREPOIDS TRACTEUR | 2039 | MV1 | | B |
| LAMPE DE SALON | 2226 | MV1 | | B |
| TABLE DE SALON | 2227 | MV1 | | B |
| CLIMATISEUR ZENITH AIR SN U64569755 | 4096 | MV1 | | M |
| CLIMATISEUR G.E. 264198 | 4097 | MV1 | | M |
| MIROIR | 2330 | MV1 | CASSE | M |
| MIROIR | 2331 | MV1 | | B |
| MIROIR | 2332 | MV1 | | B |
| MIROIR | 2333 | MV1 | | B |
| MIROIR | 2334 | MV1 | | B |
| MIROIR | 2335 | MV1 | | B |
| MIROIR | 2336 | MV1 | | B |
| ETAGERE DOREE | 2337 | MV1 | SANS VERRE | M |
| LAMPE DE CHEVET | 270 | MV1 | CASSE | M |
| LAMPE DE CHEVET | 307 | MV1 | CASSE | M |
| MIROIR | 370 | MV1 | | B |
| VAISSELIER | 516 | MV1 | | B |
| MACHINE A LAVER | 520 | MV1 | | M |
| COMMODE | 533 | MV1 | | B |
| MACHINE A SECHER | 551 | MV1 | DOUBLE IDENTIFICATION - VOIR JG | M |
| MACHINE A SECHER | 557 | MV1 | | M |
| RACCORD ASPIRATEUR | 1573 | MV1 | | B |
| RACCORD ASPIRATEUR | 1574 | MV1 | | B |
| RACCORD ASPIRATEUR | 1575 | MV1 | | B |
| RACCORD ASPIRATEUR | 1576 | MV1 | | B |
| RACCORD ASPIRATEUR | 1577 | MV1 | | B |
| ASPIRATEUR | 578 | MV1 | | B |
| ASPIRATEUR | 579 | MV1 | | B |
| MIROIR | 669 | MV1 | | B |

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|-------------------------|------|----------|-----------------|------|
| CUISINIERE | 672 | MV1 | | M |
| TARIERES | | MV1 | AU NOMBRE DE 26 | |
| BONBONNES DENSITOMETRES | | MV1 | AU NOMBRE DE 10 | |
| MIROIR | 679 | MV1 | | B |
| REGULATEUR | 3593 | MV3 | | |
| CHAISE TABLE A MANGER | 0095 | MV3 | | B |
| CHAISE TABLE A MANGER | 0131 | MV3 | | B |
| FAUTEUIL | 0235 | MV3 | | B |
| FAUTEUIL | 0254 | MV3 | | B |
| FAUTEUIL | 0258 | MV3 | | B |
| TABLE BASSE | 2227 | MV3 | | B |
| TETE DE LIT | 600 | MV3 | | B |
| TETE DE LIT | 599 | MV3 | | B |
| TETE DE LIT | 3592 | MV3 | | B |
| TETE DE LIT | 598 | MV3 | | B |
| TETE DE LIT | 596 | MV3 | | B |
| TETE DE LIT | 3591 | MV3 | | B |
| TETE DE LIT | 730 | MV3 | | B |
| SUPPORT DE LIT EN FER | | MV3 | AU NOMBRE DE 47 | B |
| FAUTEUIL | 254 | MV3 | | B |
| FAUTEUIL | 235 | MV3 | | B |
| CHAISE TABLE A MANGER | 0620 | MV3 | | B |
| CHAISE TABLE A MANGER | 0621 | MV3 | | B |
| CHAISE TABLE A MANGER | 0622 | MV3 | | B |
| CHAISE TABLE A MANGER | 0624 | MV3 | | B |
| CHAISE TABLE A MANGER | 0627 | MV3 | | B |
| CHAISE TABLE A MANGER | 0628 | MV3 | | B |
| CHAISE TABLE A MANGER | 0655 | MV3 | | B |
| CHAISE TABLE A MANGER | 0656 | MV3 | | B |
| CHAISE TABLE A MANGER | 0657 | MV3 | | B |
| CHAISE TABLE A MANGER | 0658 | MV3 | | B |
| CHAISE TABLE A MANGER | 0659 | MV3 | | B |
| CHAISE TABLE A MANGER | 0660 | MV3 | | B |
| PULVERISEUR | 3606 | MV4 | | B |
| PULVERISEUR | 2012 | MV4 | | B |
| PULVERISEUR | 2010 | MV4 | | B |
| PULVERISEUR | 2011 | MV4 | | B |
| CANAPE | 708 | MV4 | | B |
| FAUTEUIL | 680 | MV4 | | B |
| CHAUFFE EAU | 3583 | MV4 | | B |
| CHAUFFE EAU | 3584 | MV4 | | B |
| CHAUFFE EAU | 3585 | MV4 | | B |
| CHAISE DESSINATEUR | 3587 | MV4 | | B |
| CLASSEUR | 3586 | MV4 | | B |
| LAMPE DE CHEVET | 3606 | MV4 | | B |
| COMMODE | 695 | MV4 | | B |
| COMMODE | 670 | MV4 | | B |
| COMMODE | 664 | MV4 | | B |
| COMMODE | 662 | MV4 | | B |
| TABLE DE CHEVET | 597 | MV4 | | |
| COMMODE | 593 | MV4 | | |
| COMMODE | 406 | MV4 | | B |
| TABLE DE CHEVET | 201 | MV4 | | B |
| COMMODE | 592 | MV4 | | B |
| COMMODE | 590 | MV4 | | B |

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|---------------------------------|------|----------|---------------------|------|
| COMMODE | 4087 | MV4 | | B |
| COMMODE | 4088 | MV4 | | B |
| MATELAS EPONGE | 4077 | MV4 | | B |
| MATELAS EPONGE | 4078 | MV4 | | B |
| MATELAS EPONGE | 4079 | MV4 | | B |
| MATELAS EPONGE | 4080 | MV4 | | B |
| MATELAS EPONGE | 4081 | MV4 | | B |
| MATELAS EPONGE | 4082 | MV4 | | B |
| MATELAS EPONGE | 4083 | MV4 | | B |
| MATELAS EPONGE | 4084 | MV4 | | B |
| MATELAS EPONGE | 1615 | MV4 | | B |
| TABLE BASSE | 591 | MV4 | | B |
| TABLE BASSE | 683 | MV4 | | B |
| TABLE BASSE | 2339 | MV4 | | B |
| TABLE BASSE | 2338 | MV4 | | B |
| TABLE BASSE | 460 | MV4 | | B |
| PIECES SUPPORT LIT GM & PM (11) | | MV4 | CASSES | M |
| RALLONGE TABLE A MANGER (7) | | MV4 | | B |
| TETE DE LIT PM | | MV4 | SANS IDENTIFICATION | B |
| TABLE DE CHEVET | 2338 | MV4 | | B |
| TABLE DE CHEVET | 2339 | MV4 | | B |
| LAMPE DE SALON | 2340 | MV4 | | B |
| FILTRE BURON | 2341 | MV4 | | B |
| FILTRE BURON | 2342 | MV4 | | B |
| MATELAS GM | 364 | MV4 | | B |
| SOMMIER GM | 439 | MV4 | | B |
| SOMMIER GM | 442 | MV4 | | B |
| TABLE DE SALON | 4091 | MV4 | | |
| TABLE DE CHEVET | 460 | MV4 | | B |
| FILTRE BURON | 570 | MV4 | | B |
| FILTRE BURON | 571 | MV4 | | B |
| FILTRE BURON | 579 | MV4 | | B |
| LAMPE DE SALON | 586 | MV4 | CASSE | M |
| TABLE BASSE | 653 | MV4 | | B |
| TABLE BASSE | 697 | MV4 | | |
| TABLE BASSE | 683 | MV4 | | |
| TABLE BASSE | 651 | MV4 | | |
| TABLE DE SALON | 1567 | MV4 | | |
| TABLE BASSE | 648 | MV4 | | |
| TABLE BASSE | 652 | MV4 | | B |
| TABLE BASSE | 667 | MV4 | | B |
| TABLE BASSE | 3607 | MV4 | | B |
| TABLE BASSE | 3608 | MV4 | | B |
| TABLE BASSE | 1569 | MV4 | | B |
| TABLE BASSE | 3609 | MV4 | | B |
| MALLE | 692 | MV4 | | B |
| MALLE | 534 | MV4 | | B |
| SOMMIER | 1603 | MV4 | | |
| SOMMIER | 1605 | MV4 | | B |
| SOMMIER | 3580 | MV4 | | B |
| SOMMIER | 1599 | MV4 | | B |
| SOMMIER | 442 | MV4 | | B |
| SOMMIER | 439 | MV4 | | B |
| MATELAS | 706 | MV4 | | |
| MATELAS | 889 | MV4 | | B |
| MATELAS | 701 | MV4 | | B |
| MATELAS | 319 | MV4 | | B |

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INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|---------------------------|------|----------|-----------------|------|
| MATELAS | 607 | MV4 | | B |
| MATELAS | 3581 | MV4 | | B |
| MATELAS | 3582 | MV4 | | B |
| MATELAS | 364 | MV4 | | B |
| MATELAS | 559 | MV4 | | B |
| TABLE | 4092 | MV4 | | B |
| BUREAU | 654 | MV4 | | B |
| MATELAS PM | 688 | MV4 | | B |
| | | | | |
| ARROSOIR (1) | | MV5 | BON ETAT | B |
| ARROSOIRS (9) | | MV5 | CASSES | M |
| SCEAUX(7) | | MV5 | BON ETAT | B |
| SCEAUX(1) | | MV5 | MAUVAIS ETAT | M |
| HOUES(23) | | MV5 | BON ETAT | B |
| BICYCLETTE(1) | | MV5 | CASSEE | M |
| BROUETTES(7) | | MV5 | | B |
| BROUETTE (5) | | MV5 | CASSEE | M |
| DAMES (85) | | MV5 | | B |
| HYDROMETRE | 4085 | MV5 | | B |
| HYDROMETRE | 4086 | MV5 | | B |
| FOURCHE (1) | | MV5 | AVEC MANCHE | B |
| FOURCHES (5) | | MV5 | SANS MANCHES | B |
| MANCHES (120) | | MV5 | | B |
| MOULES(2) | | MV5 | | B |
| PELLES BECHE(6) | | MV5 | SANS MANCHES | B |
| PELLES BECHE (8) | | MV5 | AVEC MANCHES | B |
| PELLES CARREES (18) | | MV5 | AVEC MANCHES | B |
| PELLES CARREES (35) | | MV5 | SANS MANCHES | B |
| PICS (23) | | MV5 | AVEC MANCHES | B |
| PICS (96) | | MV5 | SANS MANCHES | B |
| PLAQUES USAID/GOS (3) | | MV5 | | B |
| | | | | |
| BUREAU | | MVG | INUTILISABLE | M |
| CHAISE | | MVG | INUTILISABLE | M |
| CHAISE | | MVG | INUTILISABLE | M |
| COMMODE LOCALE | | MVG | MAUVAIS ETAT | M |
| COMMODE LOCALE | | MVG | MAUVAIS ETAT | M |
| COMMODE LOCALE | | MVG | MAUVAIS ETAT | M |
| LIT PM | | MVG | MAUVAIS ETAT | M |
| LIT PM | | MVG | MAUVAIS ETAT | M |
| TABLE A MANGER | | MVG | MAUVAIS ETAT | M |
| CANAPE | 079 | MVG | CASSE | M |
| FAUTEUIL | 638 | MVG | SALE | M |
| CANAPE | 639 | MVG | CASSE | M |
| CHAUFFE EAU | | MVG | 4 INUTILISABLES | |
| PULVERISEUR | | MVG | 1 INUTILISABLE | |
| FAUTEUIL | 640 | MVG | SALE | M |
| FAUTEUIL | 641 | MVG | SALE | M |
| FAUTEUIL | 642 | MVG | SALE | M |
| FAUTEUIL | 643 | MVG | SALE | M |
| CANAPE | 644 | MVG | CASSE | M |
| FAUTEUIL | 645 | MVG | SALE | M |
| FAUTEUIL | 649 | MVG | SALE | M |
| | | | | |
| CHAISE VISITEUR | 072 | SC | | B |
| TABLE SALLE DE CONFERENCE | 2112 | SC | | B |
| TABLE SALLE DE CONFERENCE | 2113 | SC | | B |

MAGASIN PIECE 5

SALLAE CONFERENC

INVENTAIRE PHYSIQUE - PROGES MAY 22-26, 1995

| NOM | REF | POSITION | COMMENTS | ETAT |
|----------------------------|------|----------|----------|------|
| TABLE SALLE DE CONFERENCE | 2114 | SC | | B |
| TABLE SALLE DE CONFERENCE | 2116 | SC | | B |
| TABLE SALLE DE CONFERENCE | 2119 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2122 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2123 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2124 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2126 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2127 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2128 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2129 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2130 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2132 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2133 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2135 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2136 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2138 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2139 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2143 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2145 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2146 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2149 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2150 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2152 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2155 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2156 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2157 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2158 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2159 | SC | | B |
| CHAISE SALLE DE CONFERENCE | 2160 | SC | | B |
| FLOWCHART BOARD | 2166 | SC | | B |
| | | | | |
| CANAPE 3 PLACES | 647 | MV | | B |
| TABLE DE SALON | 681 | MV | | B |
| CANAPE 2 PLACES | 710 | MV | | B |

WADE

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APPENDIX III

Exoneration List

List of Exonerations Submitted to USAID

| No | Item | Supplier | Quantity | CFA Value of Procurement | Exoneration Number |
|-----|-------------------------|--------------|----------|--------------------------|--------------------|
| 1. | Gasoline | Total | 5.000 | 1.236.000 | |
| 2. | Toyota Hilux Pick-Up | Diasen | 1 | 11.867.300 | 2825 |
| 3. | Photocopy Rame Paper | Rank Xerox | 1.000 | 3.000.000 | 3724 |
| 4. | Courier Coupons | DHL | 6 | 1.126.800 | 1449 |
| 5. | Diesel-Bignona Constr. | Total | 50.000 | 10.829.000 | 4476 |
| 6. | Air Conditioners | Pape. Etoile | 9 | 3.902.400 | 4477 |
| 7. | Office Suppliers | Buhan-Tess | | 2.241.200 | 5252 |
| 8. | Office Telephone System | Peyrissac | 1 | 2.316.309 | 8270 |
| 9. | Diesel | Shell | 40.000 | 8.663.200 | 4481 |
| 10. | Diesel | Total | 40.000 | 8.663.200 | 4478 |
| 11. | Diesel | Shell | 75.000 | 16.243.500 | 4479 |
| 12. | Moto | CFAO | 2 | 3.000.000 | 1492 |
| 13. | Filing Cabinets & Files | Etoile Org | 2 & 250 | 763.800 | 8667 |
| 14. | Rebar & Nails | Qu. Javelier | | 3.016.250 | 8268 |
| 15. | Basalte | M. Ndiouck | 144T | 4.608.000 | 2573 |
| 16. | Cement | A. NDiaye | | | |
| 17. | Photocopier Re. Parts | Rank Xerox | | 988.479 | 8269 |
| 18. | Vehicle for ISRA | Diasen | | | |
| 19. | Motorcycles for ISRA | CFAO | 6 | 4.189.500 | 3964 |
| 20. | Rebar.Wire. Equipment | Bernabe | | | |
| 21. | Lumber | S.O.A | | | |
| 22. | Cement | Qui Carref | | | |
| 23. | Lumber & Plywood | Qu. Javelier | | 1.963.520 | 8799 |
| 24. | Telephone Receiver | Peyrissac | | 105.500 | 8268 |
| 25. | Admissions Temporaires | Douanes | | | 13036 |
| 26. | Cement | Qu Carref | 40T | 1.947.040 | 3693 |
| 27. | Sciages SAMBA | S.O.A | 5000m3 | 825.000 | 14329 |
| 28. | Materiels Genie Civil | Bernabe | | 1.452.270 | |
| 29. | Acier Creneles | Bernabe | 2650t | 795.000 | 10544 |
| 30. | Toner | Rank Xerox | 40 | 830.000 | 13483 |
| 31. | Construction Material | N. Dagher | | 2.319.550 | |
| 32. | Vehicule Maintenance | Diasen | | 10.990 | 5278 |
| 33. | Construction Material | Qu.Javelier | | 1.510.400 | 5778 |
| 34. | Toyota Pickup | Diasen | 2 | 29.502.000 | 14646 |
| 35. | Motorcvcles | Ets Orealc | 14 | 21.882.000 | 13484 |

| No. | Item | Supplier | Quantity | CFA Value of Procurement | Exoneration Number |
|-----|-----------------------------|--------------|----------|--------------------------|--------------------|
| 36. | Charrue Portee Monosoc | Equip Plus | 1 | 3.091.700 | 13602 |
| 37. | Toyota Pickup | Diasen | 1 | 14.433.000 | |
| 38. | Spare Parts | Senn.Auto | | 2.184.595 | |
| 39. | Spare Parts | Seng auto | | 354.228 | |
| 40. | Boots | Buhan Teis | 27 | 256.608 | 13485 |
| 41. | Photocopier Xerox 5317 1 | Rank Xerox | 1 | 2.700.000 | 13483 |
| 42. | Telecopier Xerox 7024 | Rank Xerox | 1 | 1.530.000 | 13487 |
| 43. | Raincoats | Bernabe | 27 | 162.000 | 13487 |
| 44. | Paratonnere | Sakou Ent. | 1 | 3.524.663 | 13486 |
| 45. | Photocopier Toner | Rank Xerox | 10 | 380.000 | 15910 |
| 46. | Cartouches Fax Xerox | Rank Xerox | 10 | 250.000 | 16626 |
| 47. | Protection Device | Rank Xerox | 1 | 75.000 | 16626 |
| 48. | Moto Suzuki | CFAO | 4 | 5187000 | 9760 |
| 49. | Toyota For ISRA | DIASEN | 1 | 13817500 | 9345 |
| 50. | Equipement Topo | LBII | 17 | 980980 | 8799 |
| 51. | Colle Sika | LBII | 24 | 49.868 | 13488 |
| 52. | Spare Parts | DIASEN | | 1793427 | 12839 |
| 53. | Sluice Gate Const Material | SOSACHIM | 741KG | 3670680 | |
| 54. | Commercial invoice #898076 | LBII | | 9.279.936 | 14968 |
| 55. | Double Cabin Pick-Up | Diasen | 1 | 14.310.000 | 19235 |
| 56. | Water Heater + Secu.Devices | CCS | 4 | 453.600 | |
| 57. | Binding Machine | Buhan et Tei | 1 | 374.759 | 22178 |
| 58. | Chemicals | LBII, E.O | | 5.294.278 | |
| 59. | Fuel | Total | 10000 | 3.492.400 | 23508 |
| 60. | File Cabinet | Buhan Teiss | 4 | 1.539.520 | |
| 61. | Office Supplies | Buhan Teiss | | 1.010.898 | |
| 62. | Photocopy Paper | Rank Xerox | 360 | 1.120.000 | |
| 63. | Diesel | Shell | 150000 | 33.283.500 | 484 |
| 64. | Diesel | Total | 125000 | 27.736.250 | 483 |
| 65. | Topographical Equipment | B.C.G | 13 | 849.400 | 21924 |
| 66. | Tools | Buhan Teiss | 47 | 894.597 | 21598 |
| 67. | Disjoncteur CN50N 4P4D | Buhan Teiss | 1 | 559.292 | |
| 68. | Tires & Tubes | S.S.P.I. | 48 | 1.776.324 | 5387 |
| 69. | Toner Xerox | Rank Xerox | 12 | 180.000 | 23509 |
| 70. | Spare Parts Pho. Mach | Rank Xerox | | 487.711 | 11906 |
| 71. | Basalte Ent Franzetti | SSEC | 62T300 | 375.600 | |
| 72. | Materiaux Ent Dagher | Mme Dagher | | 3.548.500 | |
| 73. | Computer Equipment | Louis Berger | | | 4309 |
| 74. | Soil Testing Equipment | Ele Intl | | | 5412 |
| 75. | Gas Oil | Total | 27000 | 6.035.310 | 9558 |

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| No. | Item | Supplier | Quantity | CFA Value of Procurement | Exoneration Number |
|-----|--------------------------|-------------|-----------|--------------------------|--------------------|
| 76. | Franzetti # 0105/95 | In. 3136/95 | | 12.863.216 | 003995 |
| 77. | Franzetti # 0105/95 | In. 3138/95 | | 15154043 | 003996 |
| 78. | Franzetti Contour Berm | In. 3139/95 | | 744000 | 003997 |
| 79. | Franzetti # 0105/95 | In. 3140/95 | | 19944184 | 006078 |
| 80. | Sococim | 40TCHF | | 1905040 | |
| 81. | Franzetti # 0105/95 | Basalte | | 180540 | 006082 |
| 82. | Franzetti # 108/95 | | | 14689623 | 006079 |
| 83. | Franzetti# 3148/95 | Decpt#2 | | 23314362 | 006080 |
| 84. | Franzetti#3147/95 | Decpte#3 | | 20145056 | 006081 |
| 85. | Sosachim | Inv# 1085 | | 45619500 | |
| 86. | Sosachim | Inv# 1084 | | 3670680 | |
| 87. | Sococim | Inv#176 | 41TCHF | 1952666 | 006083 |
| 88. | Total | | 43000Lit | 9482790 | 11908 |
| 89. | Total | | 11000Lit | 2425830 | 11908 |
| 90. | Sosachim | Inv#2462 | 50Vanne | 15206500 | 007222 |
| 100 | Elie Milan/Cont 00108-95 | Inv#0008-95 | Transpor | 15M3 | 007222 |
| 101 | SSEC/Cont 00108-95 | Inv# 120-95 | Basalte | 3/8 - 8/16 | 007223 |
| 102 | Sosachim | Inv#2491 | 55Vanne | 16727150 | 006970 |
| 104 | SSEC | Inv#131/CA | 11T400 | 68400 | 006969 |
| 105 | Ent.M. Ndiouck | Inv# 078/95 | Basalte | 5256000 | 006971 |
| 106 | Ent.M.Ndiouck | Inv#079/95 | Basalte | 936000 | 6971 |
| 107 | Ent. Franzetti | Inv#3153 | Travaux | 20307331 | |
| 108 | Ent. Franzetti | Inv#3154 | Travaux | 22523650 | |
| 109 | SOSACHIM | Inv#2477 | Vannes | 13685850 | 007342 |
| 110 | Douanes Senegalaise | Adm. Temp | Vehic. | | 13936 |
| 111 | SOSACHIM | Inv#2501 | Vannes | 3041300 | 009351 |
| 112 | Rank Xerox | ProfInv#114 | Fax | 1170000 | 18488 |
| 113 | Rank Xerox | ProfInv#115 | Copieur | 3000000 | 14488 |
| 114 | Rank Xerox | ProfInv#117 | Ram/To | 136000 | 009352 |
| 115 | CFAO AFRICAUTO | Inv#101447 | Spar.Part | 347517 | 009353 |
| 116 | Douanes Senegalaise | Ad.Temp | Mot.ON | | 16906 |
| 117 | Rank Xerox | ProfInv#115 | Cons. | 650000 | 18488 |
| 118 | SOCOCHIM | ProfInv1085 | Vannes | 19383875 | 17874 |
| 119 | SOCOCHIM | ProfInv1103 | Vannes | 1292135 | 17874 |
| 120 | Rank Xerox | ProfInv697 | Rames | 1110000 | 11906 |

Grand Total #1 - 120 454.423.522 Fcfa

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APPENDIX IV

Project Photographs

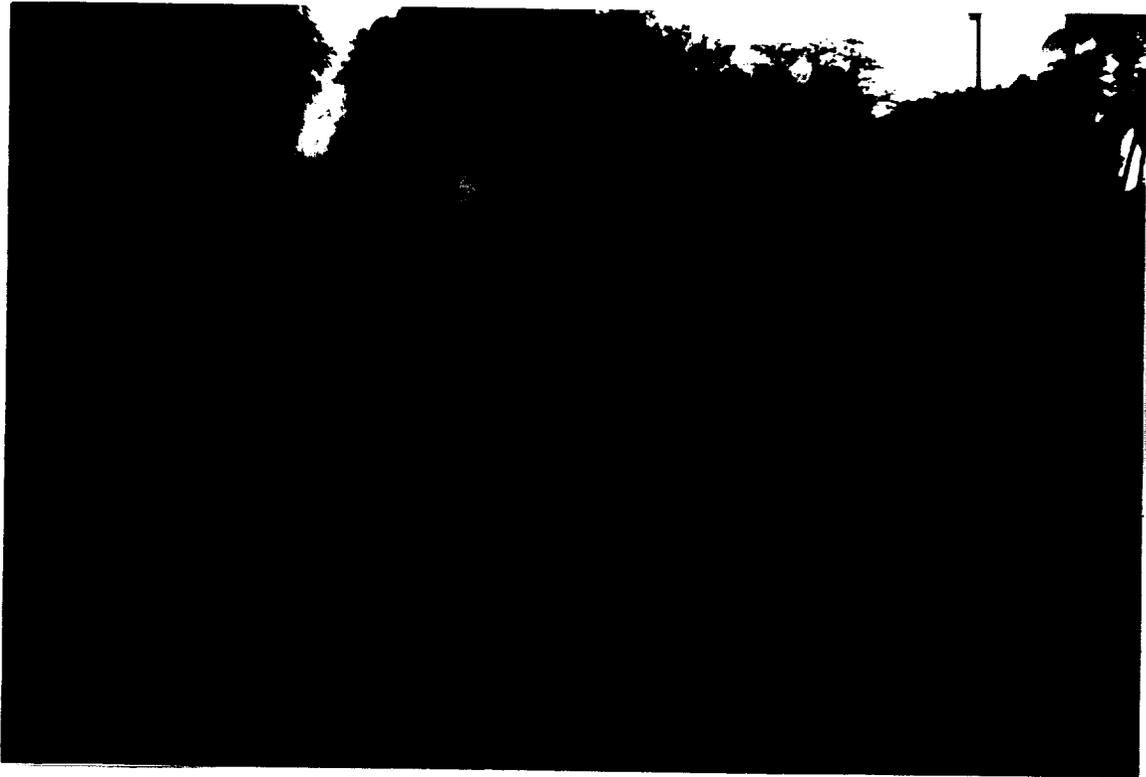
EXTENSION PROGRAM
PROGRAMME DE VULGARISATION



Compost pit
Fosse compostière
(Mayor 1995)



Ashes from burnt shells assist
in reducing soil acidity
(Nguindir 1992)
Cendres de coquillages brûlés
aident à réduire l'acidité des s

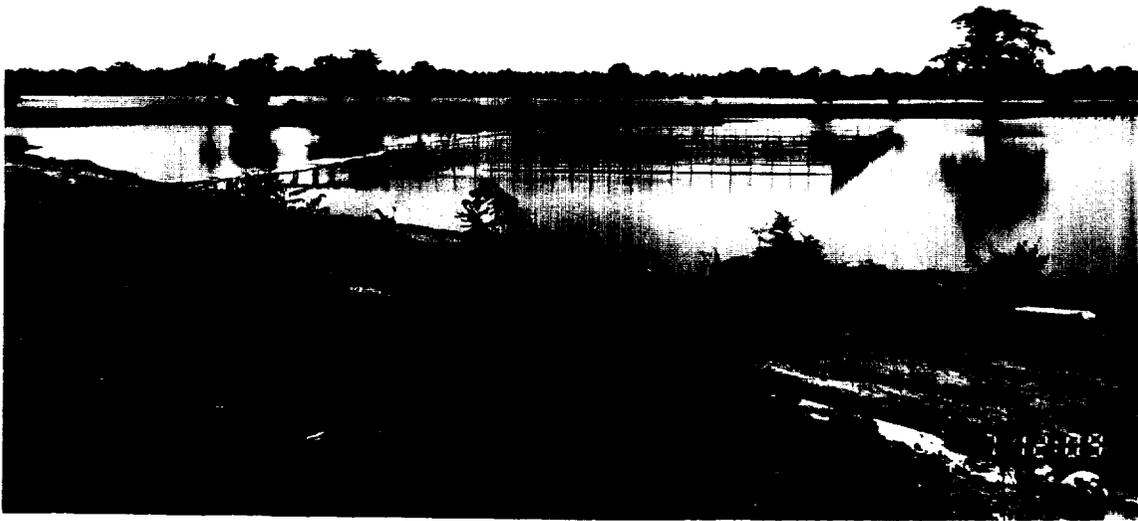


Demonstration Plots: Improved Variety Rock 5
Parcelle Pilote: Variete Rock 5 à Karoumbou (Badobar 93)



Parcelle Pilote: Variete Rock 5 à Bissassou
(Badobar 1993)

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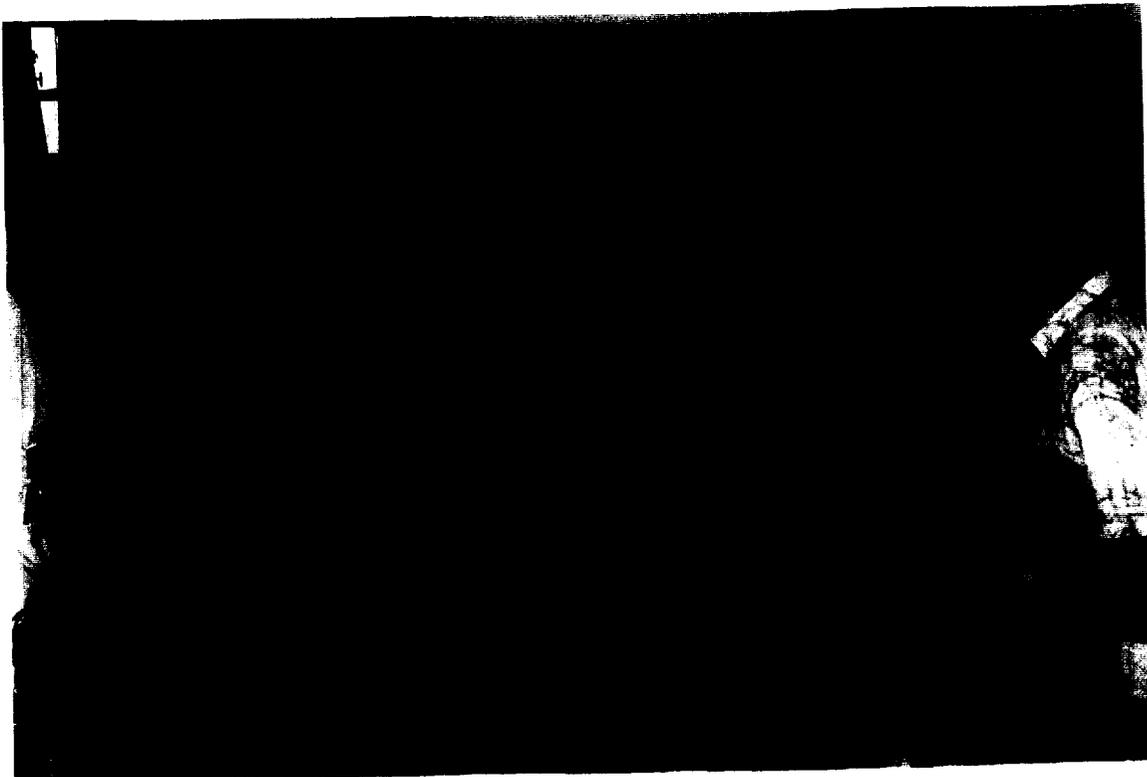


Environmental Mitigation
Fish enclaves

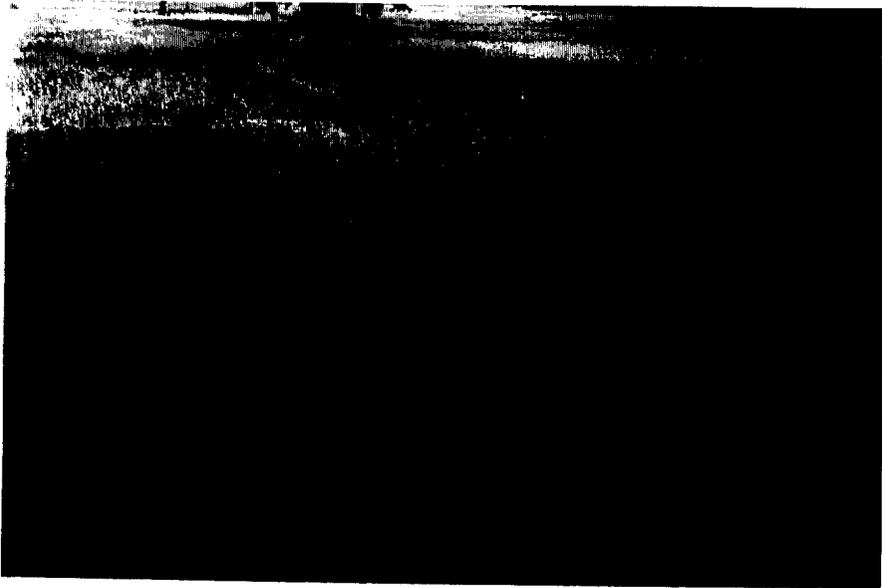
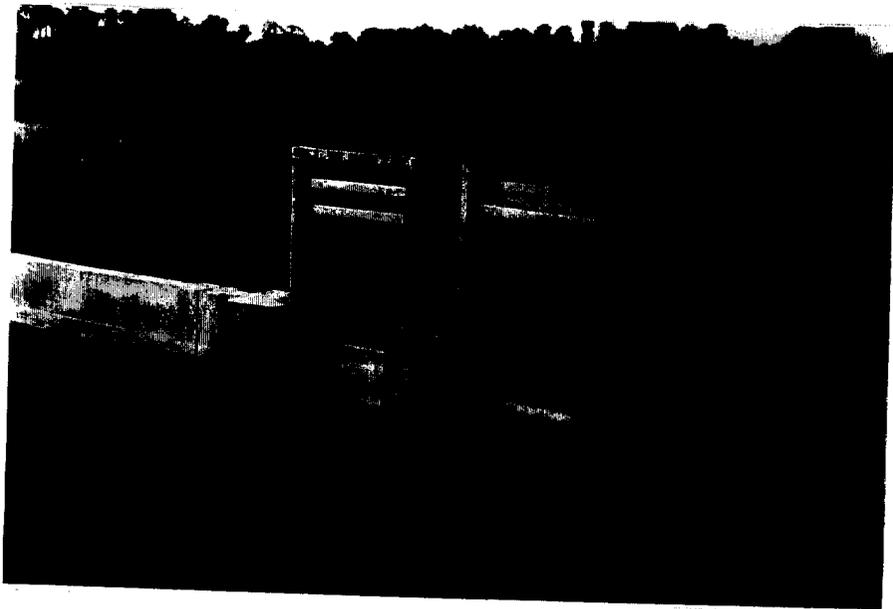
Mivier permeable pour la reproduction de poisson
retifs à l'aval



NGO field worker during Water Management
Training Session (Colomba 1995)
Animatrice pendant une séance de formation



Women's Training Session (FEFGA) Djiblor 1995
Session de Formation des Femmes (FEFGA)



Silikine/Colomba (1995)
Rice Cultivation
Culture Rizicole

**VALLEY PREPARATION AND PLANNING
PREPARATION ET PLANIFICATION**



Organization of Village Water
Management Committee
(Mayor 1991)
Organisation d'un Comité.
Villageois de Gestion d'eau



Valley Walkthrough
(Talito 1994)



Topographic Survey (Mayor 1991)
Levé Topographique

CONSTRUCTION IN PROGRESS
CONSTRUCTION EN COURS

VILLAGE PARTICIPATION IN CONSTRUCTION
PARTICIPATION DES VILLAGEOIS À LA CONSTRUCTION



Compaction of side slopes
Compackage du talus de la digue (Mayor 1992)



Gathering and Placing of Rip Rap
Pose des moellons sur le talus amont (Nguindir 1992)

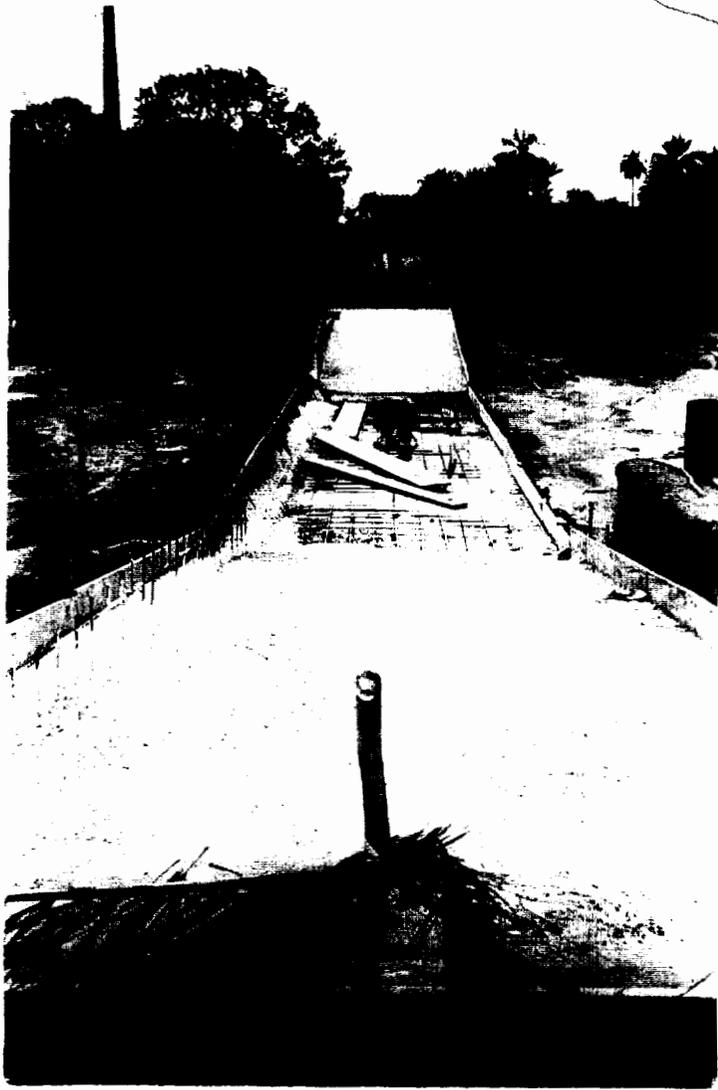


Shuttering for water control structures (Nguindir 1992)

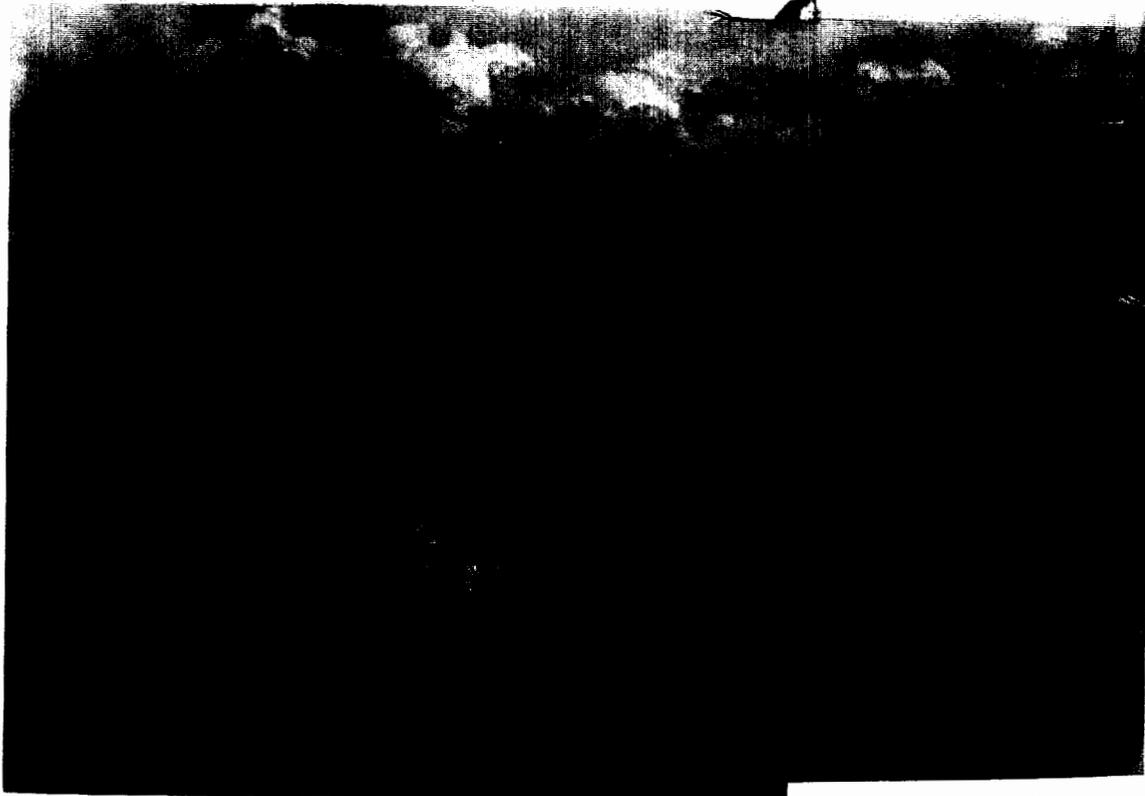


Foundation Excavation at the site of a Water Water Control Structuring
Fouilles d'ouvrage (Nguindir 1992)

100



Ford crossing at water control structure
Radier submersible à l'ouvrage de
gestion d'eau



In situ comprehension test
Test de compacité.

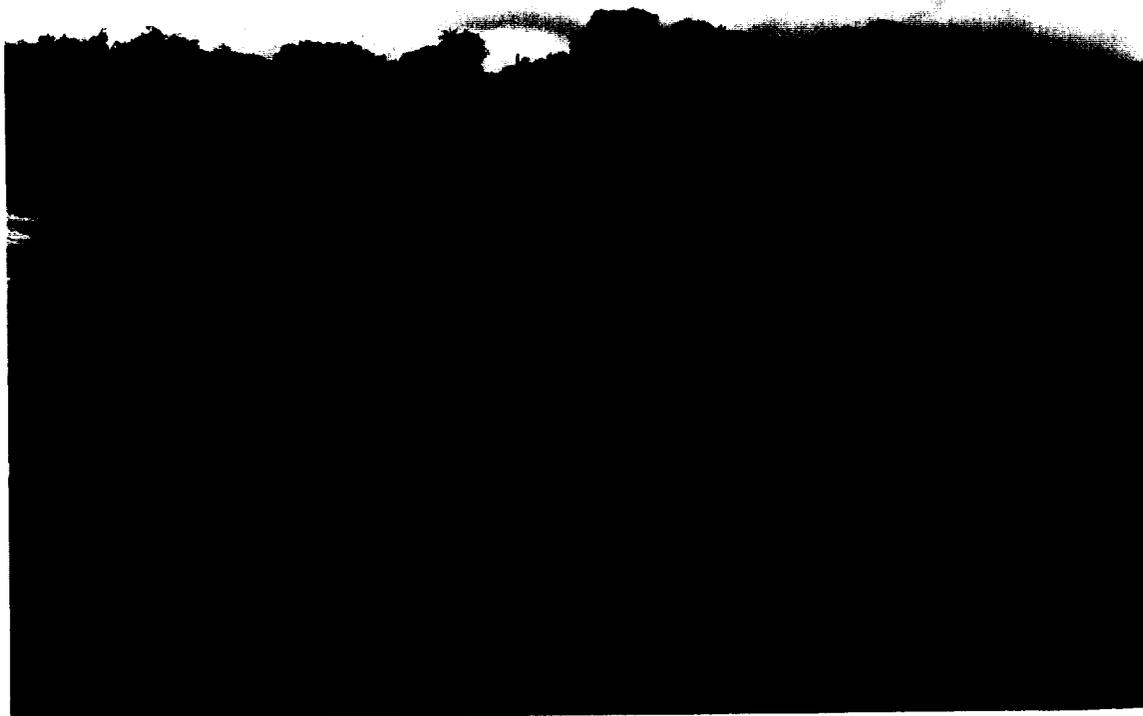
**COMPLETED WORKS
AMENAGEMENTS EXECUTES**



Completed Ford Crossing and Water Control Structure
Radier submersible et ouvrage de gestion d'eau
Mayor (1995)

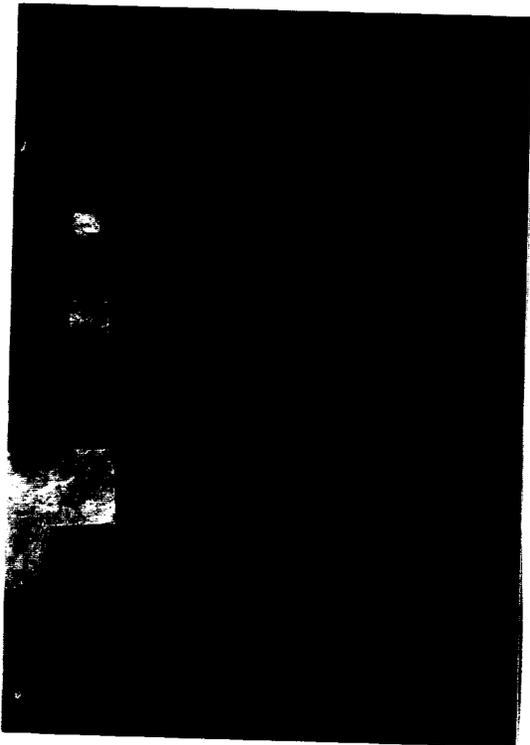
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DIGUE DE RETENTION
RETENTION DIKE
Djimakakor (1995)



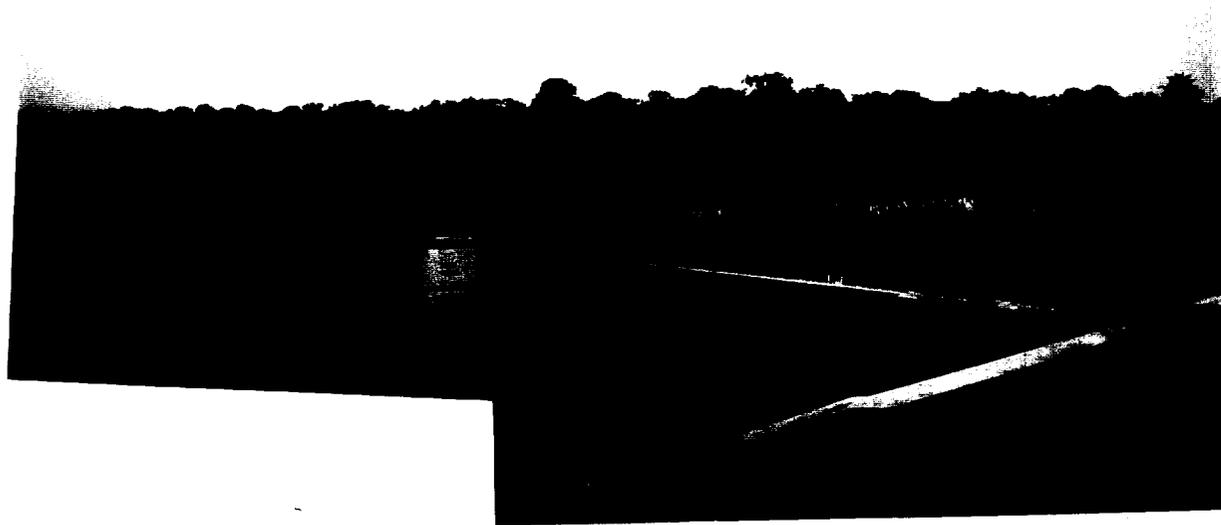


Colomba Anti-salt Dike
Spillway and water control works
Digue Anti-sel
Deversoir et batardeaux

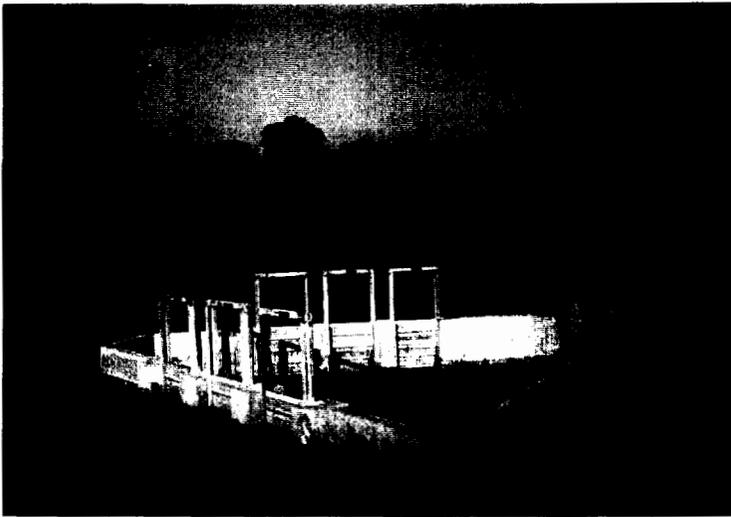




Colomba Retention Dike
Digue de retention (1995)



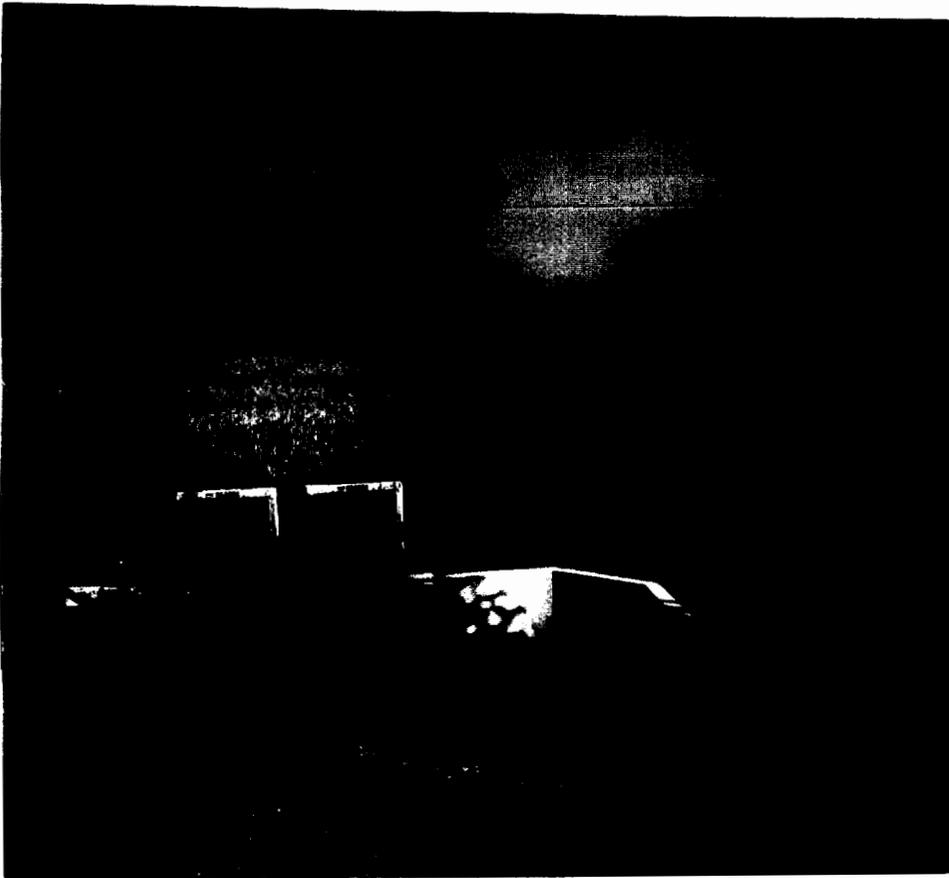
From the retention dike, looking upstream. View of
the upper part of the retention reservoir area
Vue du réservoir en amont de la digue de-retention



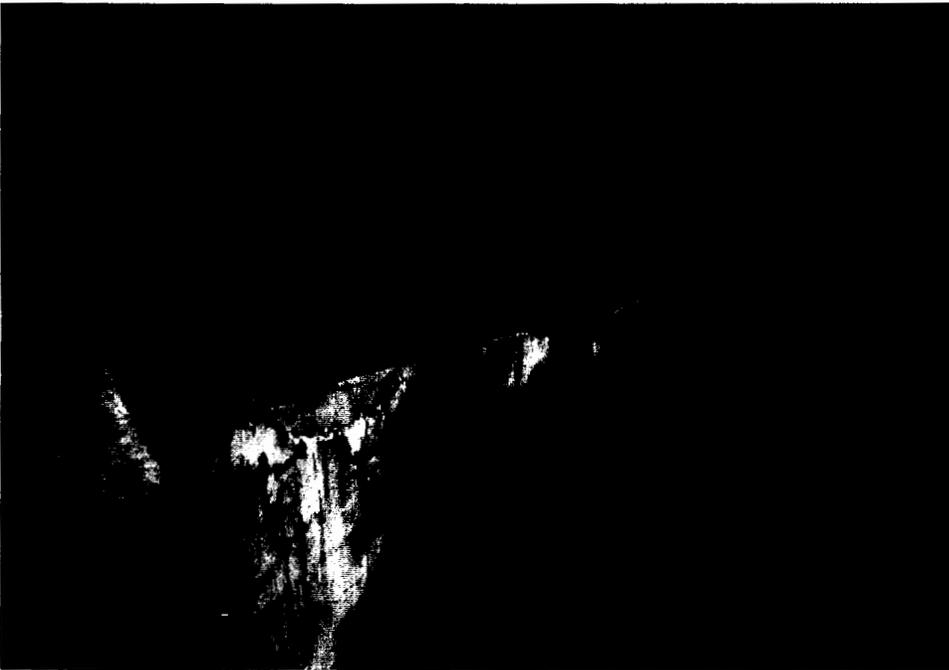
Djimande Anti-salt dike

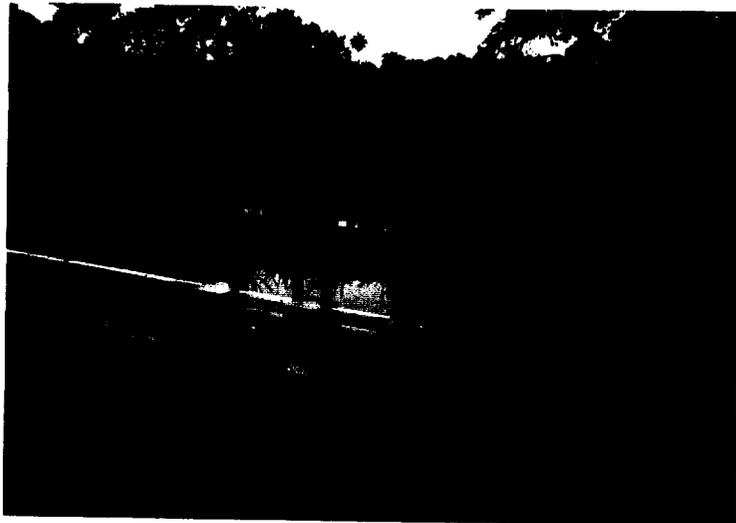
Upper left photo: left side is upstream, right side is downstream
Photo gauche supérieure: le talus amount est à l'extrême gauche

Upper right photo: reservoir area
Photo droite supérieure: Vue de la retenue



Djimaki
Spillway at retention reservoir
formed by the national highway
Deservoir créant une retenue en
amont de la route nationale



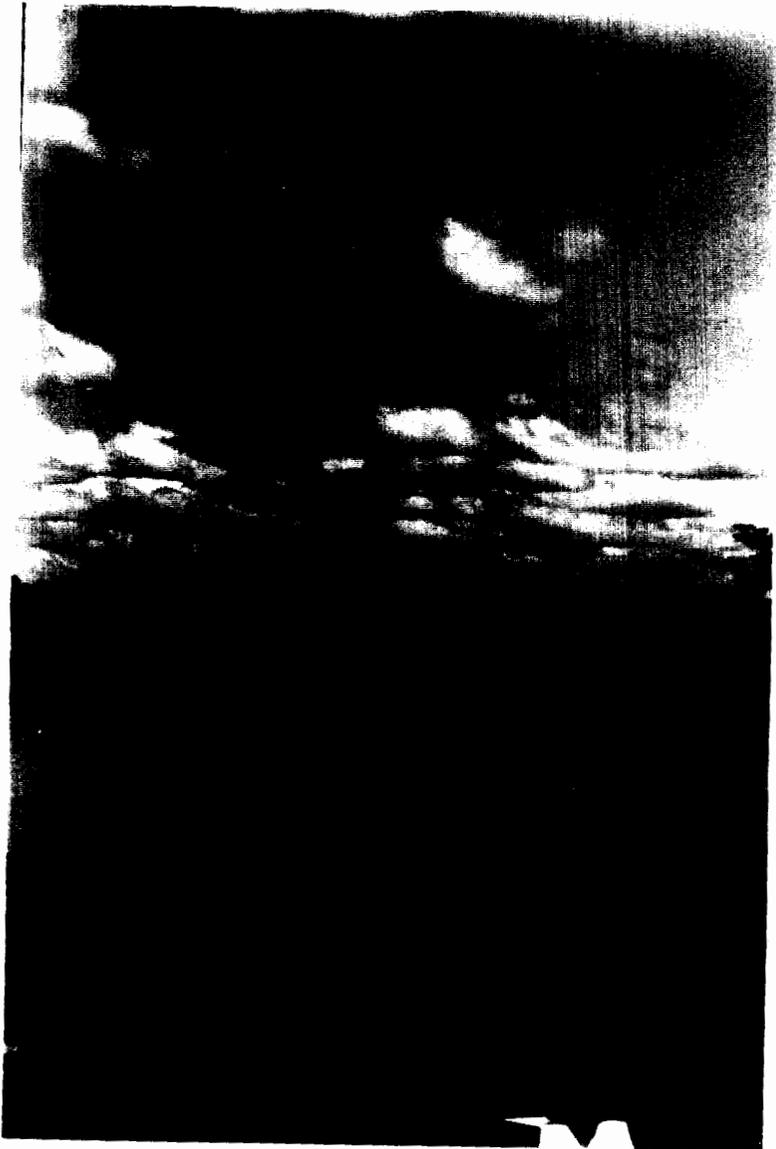


Silinkine retention reservoir formed by duckbill spillway and control works upstream from the national highway.

Vue de la retenue crée par le reservoir en "bec de canard" situé en amont de la route nationale



Concrete wall/spillway forming the retention reservoir
Mur deservoir créant la retenue (Badobar 1995)



Anti-salt Dike (Badobar 1995)
(Gated section to be completed in 1996)
Digue Anti-sel
(La partie devant être munie de
batardeaux sera achevée en 1996)

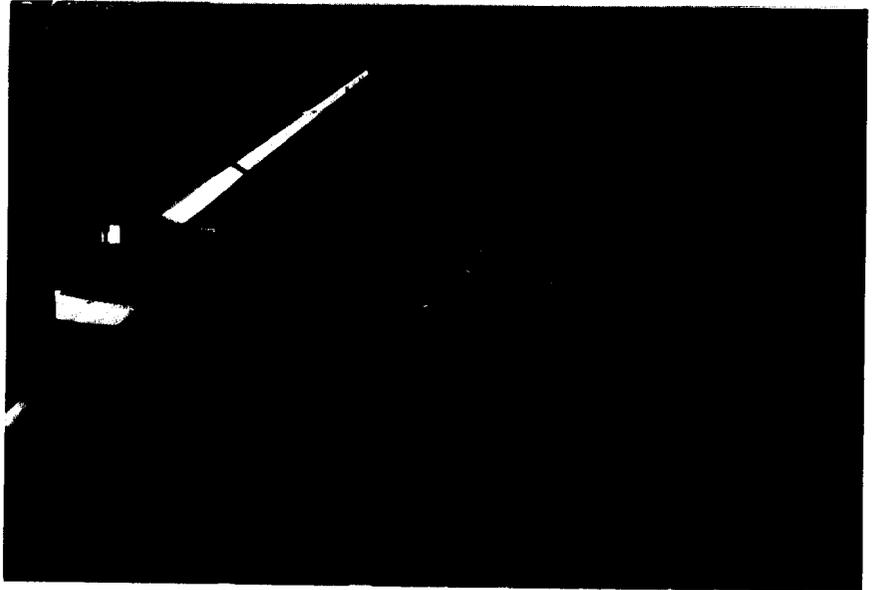


Silinkine
Anti-salt dike
Digue Anti-sel (1995)



View of the upstream end of the anti-salt dike reservoir, from the road where the spillway for the retention reservoir (#2) was constructed.

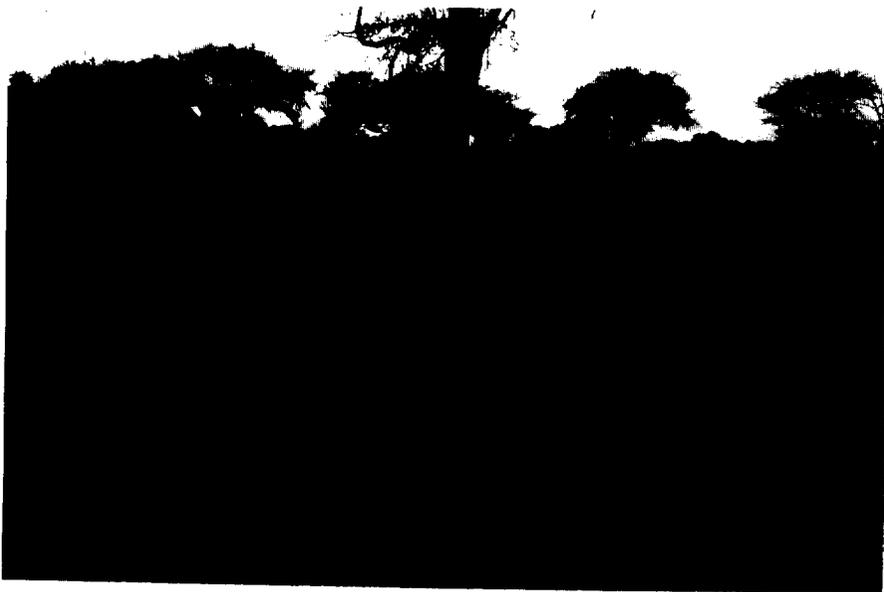
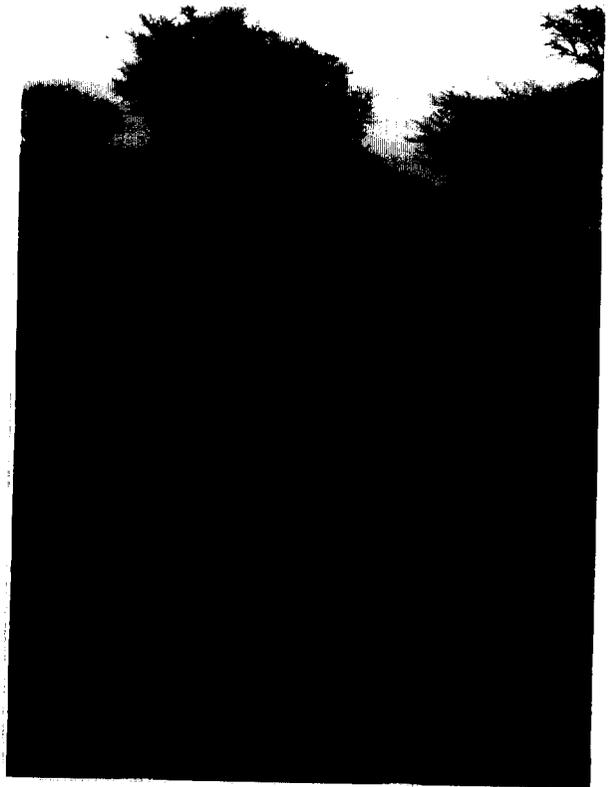
Vue de la retenue formée en
amount de la route



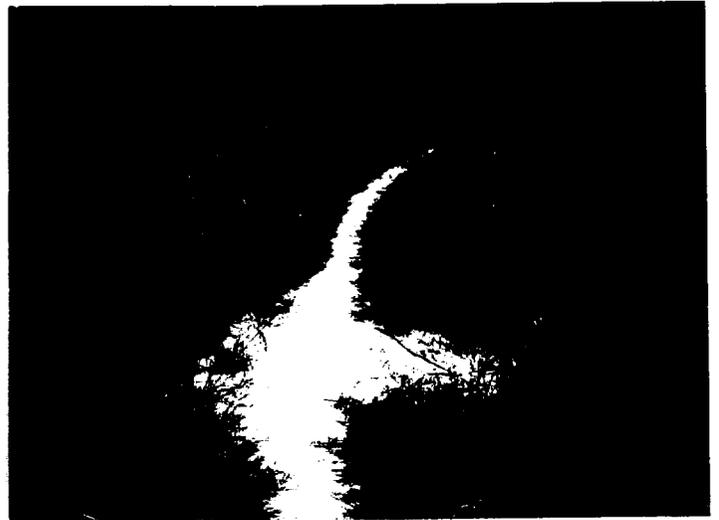
Silikine (1995)
Retention Dike
Digue de Retention

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CONTOUR BERMS
DIGUETTES SUIVANT LES COURBES DE NIVEAU



Djimaki (1995)
Contour berms
Diguettes suivant les courbes de niveau



Djimaki
Contour berm constructed by local
farmers at their own initiative
Diguettes construites par les villageois (1995)



Kadiandou Diolla (tool used by farmers to construct berms)
Outil utilisé pour la construction des diguettes