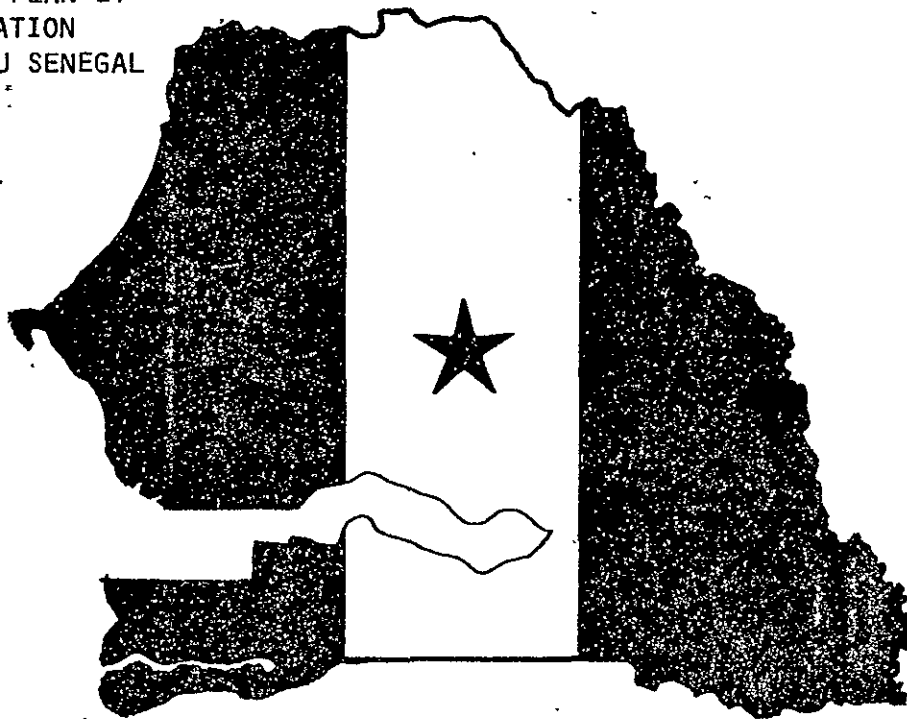


EVALUATION CONJOINTE DU PROGRAMME D'AIDE AMERICAINE AU SENEGAL

AGENCE DES ETATS-UNIS POUR
LE DEVELOPPEMENT INTERNATIONAL (USAID)

MINISTRE DU PLAN ET
DE LA COOPERATION
REPUBLIQUE DU SENEGAL



JOINT ASSESSMENT OF U.S. ASSISTANCE PROGRAMS IN SENEGAL

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MINISTRY OF PLANNING AND COOPERATION

REPUBLIC OF SENEGAL

Annexe / Annex 1980

ANNEX TO THE JOINT ASSESSMENT

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The following people participated directly in the Joint Assessment activity.

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Dr. Elliot Berg, Economist

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Ms. Pat Daly, Researcher

PREFACE

This Joint Assessment Annex is a reference work to support the conclusions of the final report.

The Joint Assessment evaluations contained in this annex are arranged in chronological order of completion. These reports are summaries of the field evaluation reports which are on file in the Mission.

Following the evaluations are summaries of the review meetings with the Government of Senegal's appropriate technical offices. These were held to discuss the evaluation results, to correct any errors, and to lay preliminary plans for corrective action as needed.

Summaries of the ENEA beneficiary surveys for each project are included. Complete survey information is also available from the Mission.

The last section of the annex carries articles of general interest to the overall Joint Assessment. The methodology for the beneficiary surveys is explained. A resumé of the plenary session with the Government of Senegal on the findings of the Joint Assessment is recorded. This session became the basis for the future planning effort.

As the evaluations were completed, USAID held a day long workshop to review and discuss the findings. The results became the basis for AID's redesign of projects. This workshop is recorded in the final portion of the annex.

Also included are papers on the general issues identified in the project evaluations and a resumé of the work done on the macro-economic study.

Finally a calendar of major activities in the execution of the assessment is presented.

In addition to the work of participants in the Joint Assessment, listed on the previous page, mention must be made of the long and difficult work done by the clerical staff. Many thanks are due to the typing pool at USAID, to the American Embassy for mimeographing, and to the C+R section of USAID/Dakar for reproducing the quantities of pages that has made this report and annex possible in two languages.

EASTERN SENEGAL LIVESTOCK

Date of request: Dec. 18, 1974

Prepared Oct. 10, 1974

Funding request: \$2,225,000

Cooperating GOS Agencies: Ministry of Rural Development,
Livestock Direction

Cooperating Donors: IBRD, FAC

A. GOAL: To assist in the rapid recovery of the livestock sub-sector as a source of food and income while taking steps to insure the maintenance and development of range resources.

1. OVI's: increased availability of animal products in both urban and rural areas
2. Improve range productivity

B. PURPOSE: To develop a replicable system of integrated range and livestock management which is socially acceptable and economically viable.

1. OMVI's: A managed grazing reserve of approximately 110,000 ha.
2. Small herders utilizing proven methods with resulting increases in revenues.
3. GOS capability to manage integrated range management system for small herders.

C. OUTPUTS:

1. Range management: GOS and herders introduced to concepts of range and livestock management and have capability to implement these concepts.
2. Livestock management: Cattle census; practices to allow increased rate of growth, increased number of calves at weaning, increased fertility, and decreased mortality.
3. Demonstrated feasibility of carrying out integrated range management program to improve range.
4. Overseas and local training.
5. Continual small scale adoptive research on possibilities for improved forage and expanded flood irrigation program.

OVI'S:

6. (1) Four GOS officials with more than one year experience. Herders voluntarily following rotation and livestock system.
7. (2) Cattle being sold at weight 10% above present weight. 40% of cows have calves at weaning. Adult mortality decreased to 8%.
8. (3) Fees levied by management level being paid regularly.
9. (4) Two management staff complete training in U.S. 6 ministry level officials complete U.S. tour. Staff complete tour and training in U.S.

1.1.2

Farmers in training courses
Small trial and demonstration plots maintained in the reserves
to try new practices such as a seeding reforestation, water
spreading.

II. COMPONENTS

- A. Fire Prevention
- B. Livestock water development
- C. Animal health
- D. Technical assistance in range-livestock management
- E. Training

INTRODUCTION

This project assessment was conducted by a team consisting of Dr. John Lewis (Office of Rural Development, Development Support Bureau, AID) and Henri Josserand (Center for Research and Economic Development, Univ. of Michigan), Dr. James Dickie (Livestock Specialist, Sahel Development Program, Bamako), Ms. V. Antal, (financial analyst consultant), from March 20 to April 8, 1980. The field survey in the Toulekeddi zone, Bakel, and Tambacouda took place between March 26 and April 4. The USAID team was formed at that time by Dr. A. Niang, Director of the Eastern Senegal Livestock Project, and by Mr. Ibrahima Fall, from the Promotion Humaine.

BAKEL LIVESTOCK PROJECTI . Summary of Findings and Recommendations

The definition and redefinition of project's goals over the last five years has been seriously influenced by circumstances that are more administrative than technical and/or economic in character.

Administrative fiat and convenience have intervened at many junctures in the history of this project. This can be attributed to the lack of agreement and understanding as to how to proceed with livestock development in this Sahelian environment.

The particular circumstances favoring pond development on the Bakel Range was the IERD Eastern Senegal Livestock Project appraiser's reluctance to extend the operations of that project further east than the environs of Goudiry. Well sightings from east of Goudiry to the watershed boundary, dividing the Toulekedé and Sarré zones at the then unplanned Bakel project, were chancey. This finding coincided with financial and operational constraints for the IERD project leaving out the geologically anomalous Toulekedé zone and the more normal zone of SAED activities to the east. USAID was then asked to attempt a livestock development plan for these zones. The Toulekedé zone had significant pasture spaces and the Sarré zone had local populations which are as yet uncovered by a separate development project.

USAID responded favorably to this request. The proposed site appeared particularly appropriate because of USAID funded livestock activities being planned for the adjacent areas, Sèlibaby, Mauritania and Kayes, Mali. This interstatel, regional strategy appeared to conform to an OMVS precedent for regional planning that USAID also wished to participate in.

While making a series of useful suggestions, the USAID project paper left the question of water point development unspecified. Wells were far from being ruled out. It was the CID (Consortium for International Development) report that presented a cogent argument for exclusive concern with catchment pond development during the first phase of the project.

An assessment of the extent to which planned inputs have been provided and used, and of the validity of design expectations is constrained in two ways:

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A. An evaluation of impact must be based on the difference in basic socio-economic indicators of the situation before and after certain inputs have been provided. Much of this information is still lacking at this point.

B. Some basic inputs are just being installed and some are partly on the way to completing and use.

Buildings to house staff, offices, laboratory, etc. have been built in Bakel and Baniou, according to project plans.

Nearly 200 km. of firebreaks have been put in place, with a functional width of seven meters, as opposed to the twelve meters recommended in the project design document. The three planned firetowers have been built, (only one was actually inspected by the evaluation team). Due to lack of radio equipment, these are not yet operational. Out of the 29 planned reservoirs, 21 have been retained in amended project plans with relocation for some, and minor redesign for others. It is expected that nine reservoirs will be completed by the beginning of the 1980 rains.

Two metal corrals have been built to date, one in Baniou, and the other in Diaré Mbolo, the village with the largest cattle herd in the area. A temporary wooden corral was built in Boulel.

Project vehicles have been provided and used with the effect described in another section of this report. Veterinary supplies have been provided during the last two years to project herders.

During the last year, personnel inputs have included four American contract technicians and their main Senegalese counterparts. Their basic duty has been to insure proper project administration, research and extension in various areas falling under general "Range and Herd Management" and "Animal Science" classification. Another major input has been the Promotion Humaine and Maison Familiale staffs. They are charged with collecting basic socio-economic observations, "sensitization" of local populations regarding questions of herd and range exploitation, home economics, and functional literacy.

Recommendations

1) The data collection and analysis arm of the project needs to be strengthened. Baseline information of the species composition and biomass density of representative sites of the Toulekedj range needs to be collected before the influence of the ponds comes to be felt. As the effect of the ponds becomes apparent, changes in these same sample sites need to

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be monitored. Likewise, the condition of sample herds, as they move between these different types of ranges need to be monitored throughout the year. This information is required in order to:

(a) Revise the details of the range management plan as it is operationalized before any false steps have detrimental consequences;

(b) To verify in detail the forage and animal production gains made possible through project investments, so that the benefits of the range management plan can be expeditiously extended in Senegal and through the Sahel generally and;

(c) To help the extension technicians to devise a technical package in animal husbandry development that is best suited to the project milieu.

2) Under the "Reforme Administrative" (72-02) and "Communaute Rurale" (72-25) laws, it is apparently possible to make pond assignments to appropriate groups of villagers. The designation of these assignments should be studied and implemented as soon as possible. Some sociological, land-use field research will be necessary before such assignments can be made. The villagers themselves seem to have a better idea of the ecological necessity for making these assignments than do the Promotion Humaine staff.

Most of the villagers (a) within the Toulekedé perimeter, (b) between it and Bakel to the northeast (zone Tampon), (c) to the east just over the water shed in the western portion of the Sarré zone, and (d) just beyond Baniou on the southwest frontier of the perimeter could be included in such a pond tenure scheme for range within the Toulekedé perimeter.

At this scale, a controlled range management experiment could be undertaken. This experiment would have to be justified, beyond its limited number of beneficiaries and its limited spread effects, by the range management data it would generate. Beyond such a slightly expanded Toulekedé perimeter, further expansion of the Range Management component of the project would encounter a more complex set of variables: severe overgrazing, denser settlements, and heavier seasonal transhumance. Ultimately, of course, livestock development project should attempt to deal with these phenomena, but the appropriateness of the Toulekedé zone for Range Management design should not be sacrificed by being engulfed in a larger project.

Range management for this greater area would require that at least some southern dry season pasture areas beyond the Bakel department be included in the overall plan. Rainy

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season, northern pasture might also have to be delineated. All this may involve interstatal arrangements worked out within the framework of OMVS.

3) If the project is to be justified, it has to produce hard evidence of the appropriateness of its range management plan. This will require a small but skilled monitoring apparatus. Data collection and analysis will require changes in project staffing and organization:

(a) If a great deal of field work calling for much strenuous effort is not performed, the validity of the entire project could be jeopardized. Project staff should be replaced should it become clear that they are shirking these data collection responsibilities.

(b) Insufficient members of project personnel are trained in the disciplines featuring these data collection procedures. Higher than mid-level research specialists from ISRA or some other research organization may have to be added to project staff in order to achieve these objectives.

(c) Participant training was recommended for three technicians for U.S. non-academic and observational training in Range and Livestock Management. Eight more were to receive one month of observational training. Three participants have completed the non-academic training and thirteen technicians are working on the project and have been receiving on the job training from the AID advisors for one to three years.

As range management science has been furthest refined in the United States, a senior specialist from a U.S. University should be called in to help develop these job descriptions of Range Specialists on the project. For these reasons, it would be worth considering encapsulating the project with a graduate training exercise for Senegalese technicians at a U.S. agricultural university.

Part of this monitoring process should involve socio-economic research on the institutional framework of production and distribution in the project zones. Such research is necessary to guide the designation of an appropriate technical package and to verify which group structures are constituted to assume which project responsibilities.

Aerial photos for range evaluation were suggested by the design team and would be helpful for proper monitoring of the Touleledi zone as well as planning in the Sarré or other zones.

4) Not too much sociological or sensibilization work seems needed to identify the clusters of villages which should assume tenure responsibility for the improved ponds. Work to date appears to have identified three groups of villages with legitimate rights in the pasture space within the Toulekedí perimeter:

- (a) villages within the perimeter itself;
- (b) villages in the zone Tampon to the northeast;
- (c) villages just east of the escarpment in the Sarré zone.

Two villages, Kadiel and Sarré itself, are within the proposed Sarré zone but appear to have fewer geographical claims to Toulekedí pasture.

User groups seem to have a certain amount of mutual agreement as to which ponds they should be controlling. Furthermore, they seemed well aware of how seriously the range control needed to be exercised. What seems to be missing is the legal authorization for them to exercise such control.

These authorizations have to be obtained by the Project direction from the National Administration. These authorizations should be sought as soon as possible before stranger herders from distant parts begin using the Toulekedí ponds regularly.

Given that the major constraint on the incorporation of local herders into the Range Management plan appears to be legal rather than educational, the continued utilisation of Promotion Humaine by the project staff may no longer be necessary. The evaluation team considers that, at this stage in project development, technical extension efforts are best left to the technical specialists rather than the Promotion Humaine animators. On a technical, livestock extension plane the sensibilization function of Promotion Humaine appears to have been successfully completed.

However, as the animation of women's labor cannot be taken over by project technicians, the evaluation team recommends that interventions at the level of village women be retained.

5) All project agents should be brought under a single administrative structure. Furthermore, that administrative structure should be free from the national administration to assign and utilize its own staff and equipment.

The need for this independence is particularly urgent for the management of automotive equipment. The physical conditions of movement in the project zone are not typical of those in

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which most Senegalese government vehicles operate. An incentive plan to insure vehicle maintenance for particular conditions of this and other remote livestock projects should be developed. The vehicle maintenance skills of the expatriate technicians should also be incorporated into this plan.

Over the last two years, nearly \$450,000 were spent on buildings for the project, both in Bakel and Baniou. This represents a high level of infrastructural investment for a project with a direct beneficiary population of under 10,000 people, and at most 6,000 head of cattle. This cannot be justified on the basis of the project area alone and indeed it was not in the economic analysis of the design paper. It was hoped that secondary benefits stemming from the experimental nature of the project would justify the costs. Whether this assumption was valid cannot be determined since the "experiment" has yet to prove successful.

The evaluation of this project proceeded in terms of the large framework of livestock production and distribution in the Senegambia. Three subsectoral question sets can be disaggregated from this framework:

(a) What is the opportunity cost of land to be used for livestock production?

(b) Where are the herds within the total area and how are they managed? How will their present and possible future movements be affected by Range Management interventions?

(c) Should, and if so how can, the effective demand for Senegambia livestock products be stimulated?

SPECIAL ISSUES

A. Land Use Planning

The Gannet-Fleming environmental assessment estimated a significant loss to livestock output once the OMVS irrigation plans are implemented for the Senegal River Basin. Furthermore, the compensatory gain in crop production may not be as great as expected. The WARDA (West African Rice Development Association) study is not too optimistic on the prospects of Senegalese rice production competing with the world market price of rice. These findings suggest a re-examination of the possible expanded use of the Senegal River Basin for livestock production.

Since the Senegal River is a permanent water source, the land around it is heavily overgrazed. The reason more animals do not spend the dry season along the river is because

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of the likelihood of their breaking into the walo fields along the river banks and, consequently, of their owners being heavily fined. Once solar and windmill pumping has been adapted to the valley, the possibilities for irrigated forage production will be more likely.

B. Transhumance

Range limitations have been overcome through most of Senegalese history by means of seasonal transhumance: disease bearing vectors retreat to the south in the dry season, leaving much forage, some of it green, behind them. Sahelian herds moving south in the wake of these retreating vectors, have come to depend on this forage for the latter part of the dry season. Finding themselves in the south with the onset of the rains, these herds cannot interfere with the germination of annual grasses to the north. Going to the north when the first natural catchment ponds fill there, these herds leave southern grasses free to grow unmolested.

Historically, this seasonal transhumance moved up and down the Senegal and Faleme Rivers. Because of the river's north-south flows, no series of water points needed to be improved, as elsewhere in the Sahel, to permit the movement of the Sahelian herds. These rivers have now become national boundaries, making their crossing for the purposes of seasonal transhumance increasingly difficult. Furthermore, the intensification of walo cultivation along their shores has made their use more difficult for livestock. This does not mean that the transhumance herders are on the verge of defining and developing a series of water points (dug out ponds, traditional wells) enabling them to reach the Senegalese south without passing by the rivers leading them to the Malian south. However, should such a route be made possible by improved water points in the Toulekedé perimeter connecting to IBRD financed wells to the south, it is likely that many transhumants would seek to utilize that route.

This transhumant "invasion" would be a bad thing for the Toulekedé Range Plan, but not necessarily for the Toulekedé Range itself as long as the transhumants did not dwell there but kept moving south. For the transhumant herds themselves, it would be a very good thing. In most of the Sahel, a successfully transhuming herd is more fit than a sedentary one.

Even if the present Bakel project can avoid inclusion in the planning for a region-wide transhumance, a wider-ranging livestock project could not avoid taking this transhumance into account. It may seem surprising that authorities are as hospitable to Mauritanian herds as they are in the dry season. But, it should be remembered that many Senegalese herds gain

more weight on Mauritanian grasses during the rainy season than Mauritanian herds do on Senegalese grasses in the dry.

C. Zonal Stratification

Zonal Stratification and its present implementation in the SODESP context, received detailed treatment in an economic annex to the joint assessment report. If offtake (once it is measured) is to be taken as a measure of the success of the Bakel Range Plan, more should be known about marketing options capable of stimulating that offtake. While augmenting the Dakar meat supply was not cited as a goal of the Bakel project, raising incomes in the project zone was.

The economic analysis suggests that there might be some advantages to introducing a low key l'embouche paysanne within the framework of a project emphasizing range management.

II. Project Components

A. Range Management

The Range Management interventions being attempted through this project are among the most innovative in the Sahel.

1. Water Development

Elsewhere in Senegal, livestock development investments have featured the construction of permanent water points (wells) despite the well recognized denudation that earlier investments of this kind have caused. The accentuation of denudation experiences in the 1972 drought brought forth more of a flush of well-management proposals than it did an indictment of well construction itself.

FED investments in the sylvo-pastoral zone of the Ferlo (Region du Fleuve), and IBRD investments in Eastern Senegal both feature the upgrading and construction of permanent wells. The environmental and economic feasibility of these constructions is argued with carefully articulated management and/or range tenure plans.

There are several reasons to doubt, despite the theoretical soundness of the proposed management plans, that range improvement will ever issue forth from investments in permanent water points:

a. Environmental - It is harmful having the herd/flock graze in the same place every year, at the onset of the rains, and during the early months of the growing season. It is then

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that the annual grasses have to rest in order to reproduce themselves by going to seed. Of course, as natural or man-made catchment ponds fill up with the rains, the animal's dependence on the well is decreased. But two pivotal months can have passed between the onset of the rains and the discovery of a conveniently accessible pond that has filled.

A permanent well permits a pastoralist to wait as long as necessary for the most geographically convenient catchment to fill. Whereas, without the well he would be obliged to reconnoiter each year for a catchment pond. This would rarely be the same pond in successive years. Therefore, without permanent water, the scattered impact of the Sahelian rains insures a certain amount of grazing rotation.

b. Demographic Reasons - Permanent wells intended for pastoral purposes have been known to spawn whole villages of millet farmers. Two drawbacks to such developments should be emphasized:

A millet-farmer bound by his farming schedule and his need for work-animals, keeps much of his herd nearby until the germinating millet catches the attention of his livestock. Only then will he move these animals to the nearest pond, so that farm laborers can continue to benefit from the milk production and not be taken away from the fields.

By weeding out the grasses in his millet field year after year, the farmer reduces the seed inventory of the patch of ground to a point from which it cannot recover even after the field is abandoned for fallow. Many denuded spots in the project zones appeared, from the archeological indications (baobab cluster, potsherds and small tells), to correspond to the sites of former villages. Many ecologists feel that millet is more to blame for desertification in the Sahara than the goat.

c. Juridical Reasons - When a well is constructed under government auspices, particular groups regarded as having historical claims to a given land area are reluctant to restrict access to that well. Only with more recent projects have national authorities considered granting exclusive-use group rights for wells constructed under their auspices. The IBRD financed Eastern Senegal Livestock Project proposes giving tenure control of the wells it constructs to specific communities. It was not feasible to establish how well this proposal is working for the wells constructed to date. The Bakel Livestock Project staff maintains that it would be fruitless to attempt to control access to any wells constructed.

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It is interesting to note that the Bakel project is primarily constructing ponds, not wells. The most fortuitous aspect of the original design is that wells have not been chosen for this component. Yet much of this novel experiment will have been in vain if data on its impact is not collected and monitored. At present, there is no plan for doing this.

The question of knowing when, how and by whom the reservoirs will be used is critical. Indeed, pond construction, as the only true experimental component in the whole project, will have to be given much attention at the conclusion of the coming dry season. During the last rainy season only two ponds were filled sufficiently for use by herds at the beginning of the dry season; evidence to date on reservoir use is limited.

Use of the reservoirs by populations in the Toulekedi area offers economic benefits in the form of better range management and animal nutrition during several months of the year. This should translate into increased productivity both in the range and village herds. On the other hand, their use involves costs. The most significant costs as far as can be judged now, are i) extra labor requirements to watch over the range herd, ii) added risk in having animals stay longer at bush camps, because of predators, and iii) the value of manure from animals previously kept in village fields overnight. The latter factor may have the most economic significance.

Similarly, there are both benefits and costs to limiting reservoir access to people from the area.

The success of the Bakel Range Management plan depends on the pond tenure assignments to the appropriate groups of villagers. Pond tenure assignments are all that much easier to make because few of the herds in the project environment transhume out of the area. Furthermore, because of past scarcity of water points, few outside transhumants are in the habit of using this area. Therefore, conditions at present are unusually favorable for the implementation of a Range Management Plan based on the tenure control of specific project ponds by specific villages. As ponds are likely to attract transhumants almost as soon as they become operational, the implementation of a pond tenure scheme should take place as soon as possible.

2. Firebreaks

Firebreaks (137 km. built), and fireworkers have absorbed so far about \$160,000 worth of resources. Firebreak construction has been scaled down from the original plan. Those that have been or are being constructed can be considered

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as minimum road infrastructure for the Toulekeddi perimeter. Ready access to all corners of the pasture perimeter is as necessary for project staff as it is for project livestock. Whether firebreak roads will be decisive in getting fire fighting teams out to a brush fire in time is highly questionable given:

- (a) The advanced age of the leaders of the village level teams;
- (b) The state of project vehicles;
- (c) The irregularity with which the observation towers are manned.

There are, moreover, two major problems on this issue. First, is the contradiction in design which recognizes, on the one hand, that bush fires are a "social problem", and which advocates, on the other, an almost completely technical approach to the problem. This approach (firebreaks, towers, highly structured fire teams, etc.) depends for implementation on an extensive education and information program. The concept of trained, highly organized and well equipped fire teams, strains credulity in the Toulekeddi context.

Secondly, the economic benefits of a fire control infrastructure are not all that clear-cut. Even if one assumes random occurrence of fires, one is left with the question of the degree of effective protection afforded. Also, some types of fires are more beneficial than harmful. Several advantages of the "early burns" economic value are:

- Reduced insect population likely to irritate cattle or compete for the same food;
- Stimulation of growth in woody and herbaceous species without knock-back effect;
- Reduced ground cover and old growth, making stock access to feed easier;
- Removal of dead annual plant parts. Predator control is also often invoked.

Insofar as "early burns" are more helpful than detrimental, firebreaks may make their use and control easier. This point should be investigated by project technicians between now and the end of the year.

The transportation advantages of firebreaks to villagers are negligible. As firebreaks, the utility of these roads is debatable. So far, as many fires have been stopped by them as have jumped them. In these cases, wind velocity and direction have been as decisive as firebreak width. An analysis of the costs and benefits of increasing and widening them or supplementing them with "back burning" needs to be done.

A recent survey of burns since October 1, 1979, indicated that the firebreaks only prevented crossover fires about 43% of the time. A 40% to 60% burn was calculated for the area, therefore a saving of 8% - 12% of the forage was retained, which would convert into about \$70.00 to \$100.00 worth of livestock produced. Given a cost estimate of \$600.00 per kilometer of firebreak plus \$140/km for animal maintenance, firebreaks do not appear to be cost effective. Nor are the observation towers or firefighting groups, neither of which have been used at the time of the evaluation.

B. Animal Production

Compared to Range Management, the Animal Production components of this project are not as innovative. Animal health, production and marketing inputs of the project can be immediately extended beyond the expanded range of the Toulekedji zone. The villages of Sarré and Kadiel, on the eastern side of the Sarré perimeter, fall outside this zone yet are already receiving some project inputs. An economic analysis of the costs and benefits of steer fattening with agricultural by-products in the Bakel area was made. An experiment of this kind might be worth launching in those villages, in view of their high levels of agricultural production but limited access to dry season forage.

The agricultural output of these villages, not to mention those under SAED along the river to the east, may justify a l'embouche paysanne program using such by-products.

The extension of this experiment would probably be undertaken by technical staff rather than by Promotion Humaine. Here again, data is needed in order for a genuinely expanded livestock project to be designed.

1. Animal Health

Health interventions have a much longer history than any other livestock development activities in Senegal and in West Africa. Personnel have been trained and animals have been vaccinated, with impressive results, for decades. It appears doubtful that USAID could field a full-time, expatriate technician with better diagnostic capabilities for Senegalese

livestock than the GOS has. Commodity support in this area has impressive results. However, as the herder usually ends up paying for vaccine one way or the other, it would seem that the recurrent cost problem should be tackled from the outset. Payments for the vaccine should be channeled back into project financing. Herder associations should be authorized to evaluate the performance of field staff in order to exclude those who might be inspired to water down the vaccine as a result of this requirement.

2. Animal Husbandry

The extension structure has nothing to extend. Furthermore, it is as necessary to assess the situation as to define an appropriate extension package. The first phase of this assessment process would require that project technicians seriously apprentice to local herders, who appear to know more about how to produce animals in this zone than anyone else. The training of GOS technicians, both before and through the project, has done little to prepare them for this technical dialogue. The fact that all contacts are considered the domain of Promotion Humaine "sensibilizers" only makes technicians that much less likely to initiate a dialogue with herders. For their part, herders would rather talk to technicians who at least know something about livestock than to "sensibilizers" who know very little. The fact that more of technicians speak Poular than "sensibilizers" also reinforces this desire.

Data that might lead to the definition of an appropriate Animal Husbandry extension package has not been generated. This may be because the Promotion Humaine staff are not livestock specialists; or it may be because none of their vehicles (four Volkswagens, one Landrover) work anymore; or it may be because the livestock specialists get along neither with each other nor with the Promotion Humaine staff, who are now obliged to borrow the vehicle while it lasts. In any case, local herders remain unrivaled experts on animal husbandry in the project zone, and project staff has yet to learn what they know.

C. Participant Orientation and Organization

Delays in this project component can be attributed to the same technical, linguistic and vehicle unavailability as was cited previously. Promotion Humaine should be designating village clusters to be given pond management responsibilities. This process has not gone beyond the conceptual stage because:

(a) There are disagreements at the national level on how to reconcile the requirements of rural development with the "domaine national" law:

(b) There is a seeming reluctance of project staff to cede control over project infrastructure to any but themselves;

(c) Few, if any, of these villagers have been hired for the labor required by the project, in spite of project documents listing this as one of the benefits to them. Some labor seems to have been recruited from outside the zone, even the Bakel area.

1. Animation and Community Development

The mandate given to Promotion Humaine, as expressed in the March 5, 1976 amendment to the Project Agreement, charges it to study, orient, organize, instruct, and technically train the herders. In practice, Promotion Humaine agents are not technically qualified or motivated to either study or extend. Yet because they are responsible for transferring information between villagers and the project planners, no other unit in the project takes responsibility for the appropriateness of the information transmitted. There is some danger in giving a technical extension role to animators whose mandate is only to change attitudes before others come in to change techniques. The implication of the presence of Promotion Humaine staff to many of the concerned parties is that "development" is constrained by village ideologies as much as by village economy and technology. The proper analysis of the latter is forestalled by this implication.

Promotion Humaine has shown little initiative in gathering any information on their own, they do not seem to understand their mandate well enough to know what to ask for. The Promotion Humaine staff has had difficulty linking the social aspects of the projects to the technical side. What was needed was not a sociological description of the area but a social network analysis of land use groupings, behavioral observation of animal husbandry practices, and a quantification of energy flows into and out of each production unit (i.e., specific findings that relate to the technical objectives of the project). As the Promotion Humaine staff is unfamiliar with the technical rationale for the project, and project technicians are given no role in data collection, sociological findings were not related to the technical objectives of the project.

Promotion Humaine launched the orientation function without an adequate dialogue having taken place with herders on Range Management and animal production possibilities; they launched the organization function without an adequate understanding of these groups which play a key decision making role in range use and herd management. As a result, technical personnel have not developed a more appropriate extension

1.1.17

package, and Promotion Humaine is no closer knowing what technical requirements are to be taken into account in organizing local associations than they were prior to the start of the project.

The project desperately needs to know (1) which villages use which range areas communally and which villages and areas are excluded, and (2) what are the organizational and other constraints on herd management caused by farming organizations and the constraints on farming due to herd management.

The usefulness of the present Promotion Humaine approach for any rural community appears to depend to too large extent on the character, dedication, and style of each animateur or animatrice. In the project zone, the animatrices seemed to be the most appreciated by their constituencies:

- (a) They more frequently spoke Poular;
- (b) They had less prestige to lose by spending more of their time in the villages;
- (c) Village women are easier to contact and much more open to the non-agricultural advice that Promotion Humaine agents are most qualified to give.

2. Maisons Familiales

This activity is set squarely in the home economics and civics field and therefore has a better chance of being taken seriously than Promotion Humaine's involvement in agricultural and livestock extension.

3. Alphabetisation

Literacy in Poular would seem to be an essential prerequisite of a Promotion Humaine agent's effectiveness in the project zone. It is suggested these agents attend the literacy classes with the villagers. This would bring them into more informal contact than is presently the case; it would also bring the agents to the villages more often.

4. Management and Logistics

Any confusion over who authorizes project expenditures should be resolved without delay.

Administrative autonomy for the project is desirable in two other respects:

1.1.18

(a) The project should be authorized to make pond tenure assignments to particular (as yet undetermined) associations of herding villages in the interest of its range management plan. If villagers perceive the project perimeter as being governed by the executive whim of the project staff, they will not take as good care of it.

(b) Vehicles managed as GOS property do not last very long in the project zone, not because project staff do not know how to maintain a vehicle, but because they have little personally to gain by so doing, and they have nothing to lose by not so doing. Present policy with respect to vehicles, however much it might lend itself to private use, makes it almost impossible to implement the project.

The vehicle quagmire is particularly discouraging for expatriate project personnel. However laudable the principle of contracting these expatriate technicians as an integral part of the GOS project structure, resources expended are largely wasted if they have no control over their own project related movements. Expatriate personnel do not benefit as much from the private uses of vehicles, yet they must take unnecessary risks in vehicles suffering from the abuses resulting from their use by others. Dependence of expatriate staff on project vehicles under these conditions, causes unnecessary friction between them and their host country counterparts.

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The Livestock Subsector

As in the case of other current livestock projects, one must look at the Bakel project from several perspectives, from the local to the subsectoral levels. The soundness and relevance of the underlying logic of the project, its impact at the various levels, and the constraints within which results may be produced can then be properly assessed. In line with this approach, the relative importance and evolution of the livestock subsector in the Senegalese economy, the chief strategy pursued, and the closely related issue of the traditional livestock marketing system are briefly addressed below.

A. Importance in the Economy

The relative importance of the livestock subsector in the economy (according to such a conventional measure as proportion of value added to the gross domestic product) grew slowly from 5.2 percent in 1961 to 7.9 percent in 1975¹. The contribution of livestock to value added in the primary sector for 1975 is estimated at nearly 30 percent in the latest socio-economic development plan², and at a less than 22 percent in a more recent World Bank document³.

The relative importance of the livestock subsector may also be judged by looking at actual as opposed to planned investments, and the attendant share of foreign aid. For the period covered by the adjusted Fourth Development Plan (1972-1977), realized activities represented 51 percent of planned activities and the share of foreign aid amounted to 39 percent. For the primary sector as a whole, 47 percent of planned activities were realized, with a 58 percent foreign aid component. In the case of livestock, however, only 24 percent of planned activities took place, with a foreign aid participation adding up to 94 percent of the total⁴.

Evolution of Output, Imports and Consumption

Tables 1, 2, and 3, based on data published in a number of recent documents, trace the general evolution of basic production, trade and consumption indicators.

The effects of the 1973 drought, and the reconstitution of the national herds appear clearly in subsequent Table 1. It must be noted that over the last three years the respective shares of cattle, small ruminants, pigs and poultry in domestic meat and offals supply were 64 percent, 14.5 percent, 9 percent, and 13 percent of the total.

In recent years, the domestic livestock subsector has supplied about ninety percent of the nation's needs in meat, with the exception of 1976, when imports accounted for 20 percent of total consumed. Imports of meat have actually consisted

Table 1

TOTAL MEAT AND OFFALS PRODUCTION, SENEGAL, 1970 - 1978

	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>Cattle</u>									
Herd size	2,615	2,594	2,508	2,250	2,318	2,380	2,435	2,514	2,533
Offtake	209	218	256	300	185	190	243	251	253 10%
meat and offals	31.4	32.7	35.3	39	27.8	28.5	36.4	37.6	180 kg carcass & 38 offtake
<u>Small Rum.</u>									
Herd Size	2,700	2,800	2,718	2,412	2,535	2,619	2,739	2,811	2,821
Offtake	638	625	650	700	633	655	684	703	705 25%
meat and offals	7.8	7.7	8.5	8.6	7.8	8.1	8.4	8.6	12.3kg carcass & 8.7 offtake
<u>Pigs</u>									
offtake	134	138	150	160	162	132	160	199	150kg carcass & 180 60%
meat and offals	4.0	4.1	4.5	4.8	4.9	4	4.8	6	(30kg-5.4-5.96) 5.4
<u>Poultry</u>									
offtake	5,056	5,355	6,600	6,700	6,200	6,572	6,831	8,400	7,500 100%
meat and offals	5.1	5.4	6.6	6.9	6.2	6.6	6.8	8.4	1kg carcass & 7.5 offtake
Total meat and offals	48.3	50.0	55.4	60.3	46.7	47.6	56.4	60.6	59.6

1.2.1.A

21A

Sources: 1970-1975: IBRD, The Economic Trends and Prospects of Senegal, December 1979, p.32.
 1976-1978: Conseil Interministeriel sur l'Elevage, Ministère du Développement Rural, Feb. 1980.

1.2.1.B

Table 21974-1977 Net Components of Livestock and Meat/Offals Equivalent

	1974	1975	1976	1977
Cattle	10,850	3,460	18,800	11,770
Small Ruminant (head)	195,880	132,400	99,300	71,750
Poultry	1,000,000	250,990	---	401,700
Meat/offals Equivalent (Thousand tons)	15.04	1.17	4.04	3.05

Source: Adapted from Tables 4 and 5; Conseil Interministeriel sur l'Elevage; Ministère du Développement Rural, Feb. 1980.

Small Ruminant: 12.3 Kg. Meat and Offals
Poultry: 1 Kg. Meat and Offals

Table 3Meat Available from all Sources, 1976-1977 (Thousand tons)

	1974	1975	1976	1977
Domestic Supply	46.7	47.6	56.4	60.6
Net Livestock Imports	5.04	1.17	4.04	3.05
Net Meat Imports	-.4	.15	12.7	.1
Total Available	51.3	48.9	73.1	63.7

Source: Tables 1, 2
Conseil Interministeriel sur l'Elevage, Min.Dev. Rural, Feb. 1980.

mostly of animals on the hoof from Mauritania and Mali; their evolution and meat and offals equivalent are shown in Table 2. Adding the amounts of meat imported through the port of Dakar during the same period yields the following estimate of total consumption, shown in Table 3.

Using Fifth Socio-Economic Development Plan population estimates for 1977; per capita consumption of meat may be calculated as being 12.2 Kg. for that year.

B. Stratification as a National Strategy for Livestock Development

The main rationale behind the stratification concept rests upon the existence of various ecological zones bridging the major livestock production and consumption areas. The well-known principle of specialization in 'naissance' (cow-calf operations), ré-élevage, (growing-out) and embouche (fattening), require no elaboration here. One must be guarded, however, against the danger of equating natural ecological vocation with most efficient use of economic potential. The SODESP activities constitute the bulk of the experience to date in stratification and may illustrate the point.

According to the FED project paper,⁵ SODESP was to purchase from herdsmen cattle in five age-sex categories: weaned male calves, 1-2 year old males, 2-3 year old males, males over three and calf-cows. 84 percent of all animals currently bought by SODESP are male calves, just under one year-old⁶. Accordingly, most of the animals are kept for nearly two years at the Doli Ranch, and finished at the Keur Massar feedlot, near Dakar before slaughter. It seems that the most recent economic assessment of SODESP operations is the report prepared by D. Stryker as part of the Sahel Recurrent Cost Study (Stryker). Technical difficulties stemmed from overgrazing around forages, it being estimated that the number of animals in the area is currently about 60 percent in excess of the optimum stocking rate and higher than expected costs of forage production.

Considering long-term recurrent costs and benefits, financial problems can be traced to headquarter activities being spread over too small a productive base, (deficit: 58 million CFAF/year) and recovery of variable costs only, in the zone de naissance (deficit: 487 million CFAF/year). The growing-out and fattening activities, however, posted a 463 million CFA surplus, bringing the overall balance for SODESP activities to an annual 82 million CFAF deficit position.

An economic rather than financial analysis would have to take explicitly into account the cost of overgrazing, and various direct and indirect benefits accruing to herders. Part of the deficit at the headquarters level could be treated as an economic loss since reorganization, better administration and

management would cut on waste. In other words, the same amount of work could be done and still divert resources from headquarters to another part of the economy. The financial loss which incurred at the growing-out stage, basically springs from two facts:

1. Prices received by herders for yearling calves are higher than the present value of the steer that might have been sold three or four years hence;
2. Herders are required to pay for variable costs of extension and program operation only, fixed costs being borne by SODESP.

It is well known that under normal conditions, herders will not sell year-old calves. To do so would imply foregoing the value of the weight the animal will put on between now and normal age of sale, say, 4 to 5 years-old. In addition, the herdsman is well aware that the process of price inflation adds to the value of animals kept in the herd, but is also conscious of the possibility of mortality between now and normal age of sale. All this adds up to the fact that a herder will only sell a yearling calf today if he is offered as much as or more than his perceived present value of a 4 year-old steer three years from now. An estimation of the discounting process involved as seen in section D, suffice it to state here that SODESP currently seems to be paying a good deal more for yearling calves than would be required to induce herders to sell one year-old rather than 4 or 5 year-olds.

This, and the fact that herders do not contribute to the amortization of fixed operation costs, may well show up as financial losses, but represent economic transfers rather than real costs in the economy. As such, the only basis for judgement reverts to the purely political process. Conversely, the financial gain realized at the growing-out and fattening stages is certainly not equal to the monetary value of net added gain on each animal in the SODESP as opposed to the traditional sector, a better measure of benefits to the economy.

The current reorientation of SODESP internal policies appears to include two major components:

1. Streamlining headquarters and other administrative activities. This would involve giving the society a more 'private sector' character; reorganize the system of vehicle use, etc.
2. Rely increasingly upon agriculturalists on the border of and in the Peanut Basin for the ré-élevage component. This move is probably prompted by uncertainty over feed prices and availability in the short and medium term, and by the limited size of the high quality beef market. Both arguments indeed tend to justify a more 'extensive' type of growing-out than that currently used.

The first component, if successfully carried out, can only have beneficial results. As for the second, extensive ré-élevage on the farm, it presents major problems. Although farmers often profitably engage in 'embouche paysanne', it is unlikely that they would embrace as readily the idea of keeping young animals for two years around the farm. The chief reason is that embouche paysanne is typically a dry-season activity (5 to 6 months). Growing out on the farm, however, would run into some already tight labor constraints at planting, weeding and harvesting times. Furthermore, the animal traction argument could not be invoked since these animals would be kept between ages 1 and 3. Finally, even if farmers could somehow be convinced to keep animals on the farm for two years, the extension and credit apparatus required at the SODESP scale of operation would be enormous and very costly (in real resources terms).

It can be expected that a complete economic, as opposed to financial analysis, of SODESP operations will be carried out in the near future, to address the various issues mentioned above. On the basis of information currently available, and considering the obstacles to extensive growing-out, the SODESP experiment cannot be regarded as an unequivocal success in either a financial or economic sense. It appears that this position is widely echoed at the Mission, but I felt it worth looking at for my own purposes.

At any rate, this does not mean the complete demise of the stratification theory. One can indeed distinguish several approaches within the same concept; depending on the location and extent of the various related stages. The SODESP experience should make one wary of livestock stratification projects with high capital and fixed costs components. This leaves basically two options open - both starting from animals kept in the traditional sector 'til age 3 1/2 or 4 and depending for their success on proper timing of purchase and resale. The first one would be to rely on semi-intensive seasonal fattening. This approach was taken during an experiment at the Bambey C.R.A. with the result that three to five year-old bulls kept for five months on a daily ration of 4 Kg. of peanut hay and 2 Kg. of sorghum meal gained an average 23 percent of weight (IEMVT). The other approach would be to encourage both agriculturalists and mixed farmers to perform the same role at the farm level with local feeds and by-products during the dry season.

There is no escaping the fact that embouche, for all its beneficial effects in terms of meat supply, is really profitable in only five to six months of the year; this activity will therefore naturally not support a heavy infrastructure, be it in terms of extension, credit, or marketing. I do believe, however, that one should look closely both at the experience gained through many trials in Senegal and other African nations (e.g., IEMVT), and at the possibility of expanding the scale of embouche paysanne as currently practiced. This will offer no

total panacea for the Senegalese livestock subsector, but can go a long way yet in the direction of increased meat supply.

C. The (Traditional) Livestock and Meat Marketing System⁷

It is widely accepted that development strategies involving the primary sector must meet certain basic conditions giving free play to production incentives. In the most fundamental terms, these are:

1. Reasonably stable and remunerative producer prices;
2. Adequate marketing facilities;
3. A satisfactory system of land tenure; (see Abbott, 1967)

These simple precepts naturally apply to the Senegalese livestock subsector, including the stratification model, since its economic underpinning, regional comparative advantage in particular activities, itself depends on efficient flows between areas. The lack of emphasis on marketing in general subsector orientation, as well as in specific projects (including the AID Bakel and World Bank Eastern Senegal projects) comes as unexpected. At best, one learns or senses that the government's position is that the system should be "controlled" and "rationalized", whereas both the AID and IBRD projects were prepared with the assumption that the traditional system could be counted on or converted to handle projects output. One reason for this basic difference in approach is that the GOS tends to look both at livestock and meat marketing, whereas specific projects concentrated more on the livestock component. This is a fundamental difference.

The scope and depth of any information-gathering activity rather than research, allows neither broad conclusions nor generalizations to be made; nevertheless, several points undoubtedly deserve mention. The first is the 'absolute' information gathered about the performance of marketing in the area; the second point of interest is the deep understanding of how the system works by a few field agents; and the third, the surprising lack of the same basic knowledge on the part of people whose role and position should be founded on a much better appreciation of livestock marketing than they now have.

1. Organization of Livestock Marketing in the Tambacounda Area

Tambacounda is the regrouping market par excellence for the Senegal Oriental area. It is the undisputed central place to gather animals purchased in the area directly from herders or, to a much lesser extent, from very small satellite markets in the area. Cattle currently found on the Tambacounda stockyard come from as far northeast as the Bakel and Kidira areas, as far southeast as the Kedougou area, and as far west as the limit of the Sine Saloum region. Animals from Mauritania and Mali are also found.

1.2.6

The first step of the marketing chain is sometimes termed 'collecte'. It basically involves purchases from herders at the village level and trekking the animals to market. Although a few butchers are said to venture in villages and buy livestock from their owners, most of the trade is actually done by Dioulas. In most of the literature on the livestock subsector in Senegal, the Dioula is unjustly depicted as a profiteer and his actual role is apparently much simplified. He is frequently said to enjoy a monopsonistic position, to conceal real values and costs from stock owners, to receive preferential price treatment from established clients, etc..

This simple model does not stand scrutiny in the Tambacounda area. Indeed, local livestock service agents having spent many years in the region themselves give it no credence. Their own objections to the model of the "all powerful" Dioula lay in the following fact, freely reported:

The use of the word "Dioula" itself is an oversimplification. In my conversations with Tambacounda Livestock Service agents, were able to identify three separate economic agents falling under the general "Dioula" classification:

- a) People purchasing cattle on behalf of a merchant settled in Tambacounda, with money advanced by the same merchant;
- b) Small independent operators purchasing livestock with their own capital for resale on the major regional market;
- c) Large independent operators organizing both sales in Tambacounda and shipment to a terminal market (i.e., the Dakar area).

The Dioula has no monopsonistic power; a significant amount of sales at the village level take place without his intervention. These include sales among villagers and less frequently, sales to butchers. Although we have no data on this point for the Tambacounda area, we are very inclined to adopt their view in this respect for two reasons: a) villagers both in the Toulekedé and especially, in the Sarre zones, reported in-village cattle transactions, b) the most detailed study available on sylvopastoral zone cattle transactions (IEMVT, 1974), indicated that nearly 30 percent of livestock sales took place without Dioula involvement.

Information about cattle availability and conditions in various areas circulates freely and rapidly among Dioulas operating from Tambacounda. This undermines the notion that herders keep selling to the same Dioula all the time. Furthermore, people in the area have no qualms about becoming part of the monetized economy, many herders that can afford to do so become Dioulas themselves.

1.2.7

Dioulas pay cash for the full price of the animals they purchase. This is true throughout the region, including the 'Sarré' project zone. The only known exception is the Toulekedí area, because of its isolation and limited participation in the regional monetized economy. This situation, however, is already under change, especially after recent purchases of cattle at Baniou by the AID project. We are confident that even in the Toulekedí area Dioulas will, in a matter of months, have to extend the same payment terms to Toulekedí herders as to the others in the region.

The general conclusion is that the livestock collecting system now works well in Senegal Oriental as a whole, including the Sarré zone. If unimpeded, the traditional collecting system in the Toulekedí zone will soon work as efficiently. AID project activities in this sense should be able to provide an added element of competition at the purchasing level. Offering herders prices above what Dioulas can, in the best of conditions match, will in the long run be most counter-productive in a financial as well as economic point of view. This point is addressed again when specific project activities are examined.

The second part of information gathering on livestock marketing in Tambacounda took place at the stockyard, and included continued conversations with livestock Service agents, and local Téfanké, Dioulas and butchers, (mostly in French). As done previously in the case of the word "Dioula", the term Téfanké was found to apply to several economic agents with distinct specialized roles.

"Téfanké" proper applies to only one person on each cattle market. He is the equivalent of the Hausa "Dillali", who acts as an intermediary between buyers and sellers. As such he gathers, uses and circulates market information not otherwise centrally 'located'. This information basically consists of knowledge of prevailing supply and demand conditions, and on the degree of indebtedness among butchers. He also speaks to the livestock service and other private or public groups as representative of the various groups operating on the market. More often than not, he is also a well established cattle merchant. The Téfanké receives from the buyer 500 CFAF for each head of cattle sold at the yard.

The Téfanké is assisted by several market agents sometimes also called Téfankés, but who may just as well be called "courtiers" or brokers. They generally help the Téfanké in his work and support themselves by engaging in cattle trade with a hired "collecteur" or Dioula, or practising short-term speculative holding over a few days or, at most, weeks.

Live weight prices prevailing at the Tambacounda stockyard, (end of March 1980), were being recorded at 120 to 130 CFAF Kg. the price being given by the buyer to the market agent, and the weight being estimated by two Livestock Service agents. Occasionally a follow-up study on carcass weights at the local slaughterhouse is organized.

Estimates of major butcher operating costs in Tambacounda were gathered from Livestock Service agents and butchers at the stockyard:

Slaughter Tax	500 CFA/head
Market stall rental	1500 CFA/month
Daily market fee	100 CFA/day
Butchers license	12,000 CFA/year

The slaughter is done by butchers' apprentices, who receive the "part coutumière" in lieu of payment (offals, head, legs, part of the tail). Deboned beef is currently sold at 400 CFAF per kilogram (free market price) in Tambacounda.

Transportation of every single head of cattle out of the Tambacounda market is done by truck, the destination being the Cap-Vert area. The cost of trucking is 2000 CFAF/head, an extremely reasonable fee, given the distance involved and compared to cattle trucking charges in other West African countries.

As previously noted, the above information cannot be applied to the Senegalese livestock subsector as a whole. Nevertheless it brings to light useful data for the project area, and reveals that detailed knowledge and understanding of the system are not so hard to come by at certain levels.

During a long discussion with a high official in Dakar about marketing in the Senegal Oriental area, it was stated that cattle are always trekked from Tambacounda to M'Backé and eventually Dakar. As we now know, this ceased to be true over two years ago. Such lack of information may be the exception rather than the rule among Senegalese officials. If on the other hand this phenomenon is as widespread as we now suspect (after all it is in several other countries), we are faced with a rather disquieting situation. How can anyone indeed expect state societies to pass a fair judgement on, compete against, or bypass a complex system for which they seem to have a limited understanding?

The short inquiry into the marketing system in Tambacounda also revealed an important gap in the general understanding of the entire marketing chain; we refer here to the meat marketing element. For instance, a butcher buying an animal of the Tambacounda stockyard for 240-250 CFA/Kg. carcass weight puts meat on the market at 400 CFA/Kg. Considering the butchers operating costs listed above, one is tempted to conclude that butchers are inefficient or realize excess profits. Similarly,

with transport costs as low as about 15 CFA/Kg, liveweight between Tambacounda and Dakar, free market meat prices in the capital are even harder to accept mutely. From past experience we distrust the quick jump to an "excess profit" conclusion. There is a major need for substantive costs and revenues evidence in this area. This would provide both useful information for subsectoral planning and a broader base of common perception of project effects between the GOS and foreign aid donors.

2. Evolution of Livestock in the Bakel Area

A few basic parameters are available concerning the recent evolution of livestock in the Department of Bakel which includes the Arrondissements of Ololdou (project area), Goudiry, Bala and Béllé.

Table 4

Livestock Population, Department of Bakel,
1974-1979 (head)

<u>Year</u>	<u>Cattle</u>	<u>Small Ruminants</u>	<u>Poultry</u>
1974	142,000	153,000	170,000
1975	150,500	-	-
1976	130,000	154,000	203,000
1977	160,000	174,000	235,000
1978	177,000	233,500	411,200
1979	198,000	317,000	717,000

• 40% sheep, 60% goats

Sources: 1974 & 1976: John Eridsen, Livestock Sector Analysis for Senegal, April 1978.

1977-1979; Service de l'Élevage; Rapport Annuel, 1979:
Bakel

Basic information on local slaughters appears more revealing; local cattle consumption decreased sharply in the mid-seventies, the 1979 figure being still below the 1974 number of cattle slaughtered. Consumption of small ruminants, however, did not fluctuate so sharply.

Table 5

Controlled Slaughters of Livestock;
Department of Bakel, 1973-1979 (head)

<u>Year</u>	<u>Cattle (head)</u>	<u>Small Ruminants (head)</u>
1973	3,263	3,123
1974	1,816	2,883
1975	616	4,044
1976	835	3,404
1977	1,328	3,043
1978	1,777	3,144
1979	1,357	5,201

Average: Carcass weight: 120 kg. (cattle)
S. Ruminant: 10 kg.

Composition of cattle slaughters, 1979

Bulls and steers: 71%
Cows : 17%
Young animals : 12%

Sources: John Ericksen; op.cit.; April 1978, Service de l'Elevage, Bakel, op. cit. 1980.

Another interesting factor influenced the pattern of meat consumption in the urban centers of the area : shipments of frozen or dried/smoked fish from the Atlantic Coast.

Table 6

Sales of Fish in the Bakel Area, 1978-1979 (metric tons)

	<u>1978</u>	<u>1979</u>
Frozen Fish	43.4	98.4
Dried/smoked Fish	6.15	23.6

Note: Origins: Dakar, Kayar, M'Bour, St. Louis and Joal.

Source: Service de l'Elevage, Bakel, 1980

In his livestock Sector Analysis for Senegal, (Ericksen, 1978), the author stated that local consumption of meat and offals in the Tambacounda area had sharply decreased since the early seventies. He also reported that consumers had made a partial adjustment to new market conditions by increasing their consumption of fish. This information squares with the recent

1.2.11

data available for the Bakel area (see Tables 4 through 6). According to the FAO, (FAO, 1961), it takes 1.7 kg of fresh or frozen fish to provide the protein equivalent of 1 kg of beef. Conversely, 1 kg. of dried/smoked fish, (known in Senegal as Ketiakh and Guedj) is equivalent to 3 kg. of fresh fish, (Logoin & Salmon, 1967). Total marketed consumption of animal protein in the Bakel Department for 1979 can therefore be expressed as:

Meat	267.5 tons	(73%)
Fish	100.4 tons	(27%)
Total		(100%)

Prices prevailing on the Bakel market (March 1980), being:

Bone-in beef:	250 CFA/kg
Deboned beef:	400 CFA/kg
Fish :	300 CFA/kg

The preceding does not bear directly on the question of stratification, but may be mentioned here as a possible part of the national livestock policy. Small ruminants and poultry currently contribute 14 and 12 percent respectively to total domestic meat supply. Based on the situation in other West African states, there is room there for expansion. There is a high probability that money spent on those species would have significant payoff in terms of meat availability and incomes, perhaps even more felt within the rural sector than in the case of cattle.

D. Discounting a Steer Back to a Weaned Calf

The purpose of this section is to see under which conditions herders are willing to sell yearling calves rather than keeping these animals to weight - and value - maturity. The economic process whereby a herder accepts to sell a yearling calf today as opposed to a four year-old bull or steer three years from now includes an estimation of weight and unit price gain, and the probability of natural mortality in the interval. In other words, a herder will sell a calf today only if he receives what he estimates to be the discounted expected value of the foregone bull or steer three years hence.

Simple calculations of this discounting process take the following factors into account:

- liveweight one year-old
- expected liveweight five year-old
- expected rate of price inflation over the next three years
- combined probability of mortality over the same period.

1.2.12

For example:

- i) a one-year only in 1980 with 100 kg. liveweight
- ii) the same animal by 1984 would weigh around 220 kg. (traditional sector)
- iii) the expected rate of price inflation over the next four years may be taken at the recent national average of 12% p.a.
- iv) the current liveweight price of traditional sector five-year old bulls on a major regrouping market is 120-130 CFA/kg.
- v) based on the sylvo-pastoral zone baseline study, (IEMVT, 1974), rates of age-specific mortality for young males were:

Age	Mortality	Survival Factor (100-M)
0-1	18%	
1-2	8%	92%
2-3	5%	95%
3-4	2%	98%
4-5	2%	98%

Combined probability of survival ages 1-5
 (.92 x .95 x .98 x .98): .82

The expected future value of today's calf by age 5 is therefore: today's price for a 5-year old steer X rate of inflation over 4 years X probability of survival (about 31,000)

The rate of appreciation of any animal in a herd can be taken as 1) the simple gain in weight between 1 and 5, or 2) an estimation of herd productivity as measured by the money value of herd products X 100 divided by the total monetary value of the same herd, (see IEMVT, 1974). In either case, an average figure of 22 percent per year may be used.

The present value of the animal that might be sold by 1984 is therefore:

PV: $\frac{31,000}{(1.22)^4}$: 11,500 CFAF, which for today's 100 kg. calf translates into 115 CFAF/kg. liveweight.

Footnotes

1. Cinquième Plan Quadriénnal de Développement Economique et Social, NEA, Dakar, 1977.
2. ibid
3. IBRD Draft Economic Report for Senegal
4. ibid
5. FED, Avant-Projet, SODESP
6. Dr. L. Guèye, Director-General, SODESP, personal communication, March 20, 1980.
7. Aside from previous studies in other West African countries, which provided useful background experience, the author's knowledge of the subject for Senegal was limited to information gathered in various reports, communications with IEMVT experts in Dakar-Hann; officials at SERAS, Livestock Service agents in Bakel as well as AID Bakel project staff.

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- Ministère de la Coopération, Mémento de l'Agronome, Paris, 1974, p.117.

Survey of Project Beneficiaries

1. The survey of project beneficiaries was conducted in 15 villages of the zones of Toulekedi and Sarré. A total of 75 respondents were interviewed, about 5% of the total population of the agglomerations of herders and farmers in these regions. The two zones differ along ethnic lines and degree of herder sendentarization. However, their inhabitants share a common language.

At the time of the field evaluation and of the ENEA survey, the only beneficiaries from the project were the herders of the Toulekedi zone. They have access to new ponds, firebreaks and some controlled range land areas. This zone also benefits from the infrastructure built for project personnel and for the Maison Familiale at Ndiya.

2. The use by beneficiaries of the goods and services provided by the project is rather limited: only 15% of the Toulekedi sample (and 4% of the Sarré sample) indicate their use of new ponds while 32% indicate use of rangeland and 46% use of firebreaks in the zone. The use of ponds is necessarily limited according to the herders interviewed, by their drying up starting in November, their distance (10 to 15 kilometers) from villages and, not least important, the attraction they represent for beasts of prey.

The management of the ponds has not been adequately explained to the population involved, in spite of the establishment of herder organizations to that effect. These organizations, associations and management committees, have only a 'paper' reality and a number of their 'members' are unaware of their membership or the role they are expected to perform in the context of the project. In view of the real dangers to life and limb represented by the ponds and the wild animals they attract, the intended beneficiaries of the project clearly prefer the digging of new village wells, and the repair of old ones.

The herders in the Toulekedi zone continue traditional pasture practices; in spite of the opening of new firebreaks, there is still little or no rotation in the use of range land. They express particular satisfaction with those aspects of the project dealing with animal health: vaccination and provision of medicines for their herds.

Regarding those aspects of the project intended to result in additional income: herders are much in favor of reserving one or two cows per household for that purpose but express their inability to contribute the funds required by the project in payment for cowfeed. Except for a small-scale attempt in Medina Giraye, the offtake and marketing of calves is not practiced by herders.

1.3.2

It would appear, from the interviews conducted, that the project's technical personnel are frequent visitors to the villages in question. However, their activities are perceived to be overly specialized, fragmented and uncoordinated. Project activities that are particularly appreciated are the provision of preharvest food supplies and animal health care.

3. The beneficiaries of the two zones were informed as to the objectives of the project; however, they have not been involved in its design, its implementation, let alone the management of the new infrastructure provided.

- o firebreaks and ponds were built by bulldozers rather than with the participation of the local population and are therefore perceived as the work of the State.
- o not having been trained for that purpose, herders cannot manage project components in their own villages, and they have not even agreed with local project personnel on their respective responsibilities for achieving the goals of the project.

It is preferable for the existing village organizations to perform the role of the new participatory structures advocated by the project (range management councils). These groups will thereby benefit from current juridical statutes and accede to cooperative states.

4. The results of beneficiary surveys point to the following changes in project design and mode of implementation:

A. Training of herders so that they can assume management responsibilities for the goods and services provided by the project.

B. Training for some herders to become auxiliaries of the Livestock Service agents in the project.

C. The drilling of wells instead of the ponds now planned.

D. The upgrading in the skills of project personnel to establish closer links between them and project beneficiaries as well as to instill in them a sense of service to the communities covered by the project. Similarly, livestock and water resources agents should acquire a capability in the non-formal training of the herder populations.

E. Coordinate the actions of the monitrices in the Maison Familiales Rurales and of the animators of Promotion Humaine, and ensure that the emphasis of their training of women is more relevant to their everyday lives and economic aspirations.

Compte Rendu of Bakel Livestock Evaluation De-briefing

Date: May 23, 1980

Attended by: M. Sow (Directeur Ministère du Planification), Axel Magnuson (USAID), M. Maguette Dieye (Comptable du Projet), Allionne Blaise Mbengue (NDR/DGPA/DAP), Cheikh T. Kane (Coordinateur Volet PH. Projet Elevage), Ibrahima Fall (SEPH/SFPD), Peter Halpert (USAID), D. Abdoulaye B. Niang (Directeur Projet Bakel), Dr. Claude Salem (USAID), Melvin McCaw (Directeur Adjoint USAID), M. René Girouard (Conseiller Technique Ministère Développement Rural).

M. Sow, Ministry of Plan, Director of Planning, called for a short summary of the Livestock Evaluation.

Dr. Salem presented the major recommendations:

- o The data collection and analysis for the project needs to be improved for a number of reasons. Changes in vegetation and herd size need to be periodically assessed to determine what changes in project activities are necessary: This data is also necessary to develop technical packages for the herders.

- o The herders should be made responsible for control of the use of the water reservoirs. This can be accomplished through existing legislation.

- o Attempts should be made to make the project a controlled range management experiment. The area is small and controllable and is thus ideal for experimentation.

- o Increased training must be given to the technical staff to carry this out.

- o Technical extension efforts should be left to livestock specialists rather than the animateurs of Promotion Humaine. Promotion Humaine should continue its activities with women and general village improvement.

- o All project agents should be brought under a single administrative structure. This structure should be free to assign and utilize its own staff and equipment independently of the national administration.

- o The project should be integrated with the national economy by paying more attention to the possibilities for commercialization inherent in the project.

- o The GOS, within the scope of regional planning in the OMVS area, should consider whether more attention should be spent in livestock development instead of cereals development.

Mr. Niang, the Project Director from the Livestock Service replied that the project had been conceived in a constricted framework. The earlier work by the IBRD in neighboring zones restricted the area covered in the project. Because of hydrological factors it was impossible to construct wells. The zone was established along geographic and not socio-economic lines. For a variety of reasons Promotion Humaine agents were working in the zone in 1976 while the Livestock Service could only place agents in 1978. Mr. Niang praised the Promotion Humaine staff for having done so well in such an environment. He felt that now it was necessary for Promotion Humaine to remain involved with sensitization while the Livestock Service did technical extension. He further said that efforts were being made to commercialize production and that zonal stratification and embouche paysanné alternatives were being examined. He felt it was premature to put the project under SODESP control. Finally, he stated that the animal health program should no longer be free to herders but rather should become partially self-supporting.

Mr. Fall from Promotion Humaine stated that the technical animation of the herders had not been pushed vigorously enough. It was not really evident that by doing livestock sensitization that other behavioral changes would occur in land use, employment, etc.. Promotion Humaine should become involved in technical extension work.

Mr. Niang commented that ponds, the central concept of the existing program, were only one solution. Wells were more reliable and could be used in conjunction with ponds. He felt it was useful to reconcile the establishment of wells and ponds on an experimental possibility.

Mr. Kane of Promotion Humaine said that a "Cellule Village-ouis d'Encadrement et Production" was being formed in the project zone to coordinate various groups working on the project. He felt it was necessary to see the project through the herders' eyes. Mr. Sow closed by saying that local participation continued to be a prime objective of the project.

INTEGRATED CROP PRODUCTION - BAKEL 685-0208

Funding Request: \$3,997,000 adjusted with three amendments to Project Agreement to \$4,834,000
Project Agreement signed: 22 August 1977
Cooperating GOS agencies: Societe d'Amenagement et d'Exploitation des terres du Delta (SAED)

Life of Project: until 1981

Description

A. GOAL: Increased cereal production in the Senegal River Basin region of Senegal in order to provide a more attractive alternative to overseas work for the Soninke in the area.

1. Objectively Verifiable Indicators (OVIs)
 - a. Cereal production in River Basin to increase by 25/M.T. by 1990.
2. Immigration from basin area to France to decrease by 50% by 1990.

B. PURPOSE: Introduce farmer-managed irrigated crop production in the Bakel area to acquaint the farmers with the improved technologies and demonstrate the economic and technical feasibility of irrigated agriculture.

1. Objectively Verifiable Indicators
 - a. Total of 7,000 persons working on irrigated perimeters by 1980.
 - b. 900 hectares of land being double cropped by 1980.
 - c. Average rice yield exceeding 3 mt/hectare.

C. OUTPUTS: Creation of at least one small irrigated perimeter in each of 23 riverside villages. Introduction of improved technologies including animal traction for dryland culture in each participating village.

1. Objectively Verifiable Indicators
 - a. 24 farmer groups organized by 1977.
 - b. 24 small perimeters with a total area of over 1800 hectares developed by 1980.
 - c. 24 farmer demonstration plots underway.

Under the influence of the farmers' association, the first perimeters formed were collectively farmed with the produce distributed by the group to SAED to pay for the group's debts and to the group members for their own use. The emphasis on collectives has decreased since the inception of the project in 1975 although the three perimeters which were started in that year still farm about 23 percent of their land collectively. One small perimeter is totally collective. Fifteen perimeters have no collective land. It should be noted that the standard contract with SAED stipulates that no more than 30% of any perimeter is to be collectively farmed.

The groups have complete management responsibilities for their perimeters, deciding among themselves how the land and water will be divided, how the credit will be handled, debts collected, disputes settled and labor allocated.

The farmers are able to produce three crops per year providing they have enough water and their credit or cash position is adequate to procure the necessary inputs and labor. In the 1979-80 crop year, the farmers of the Bakel area produced 226 hectares of rice and 80 hectares of maize during the rainy season. In the cool dry season, they raised 202 hectares of maize and almost six hectares of vegetables and during the current hot dry season, they are cultivating 46 hectares of maize. While additional hectares could be put into production at much higher levels of productivity, this has not happened for a number of reasons described below.

II. Principal Findings and Recommendations

The principal findings and conclusions of this evaluation, generally support the concept of the small irrigated perimeters approach. The findings center on perfecting the irrigation systems presently under use. This involves a number of activities which must be undertaken by SAED, the farmers and by USAID to achieve optimal productivity of the lands under irrigation.

Findings:

1. In principle, the Bakel Project is conceptually sound. It is focused on the key constraint, water availability, that has impeded improvement in the standard of living of the people in the area and has reduced agricultural production.
2. The role of SAED as supplier of inputs as well as provider of technical assistance is a necessary one at this stage of development, SAED's stated policy in Bakel of passing to Project participants more of the responsibility for management, as private institutions develop, is supported. This policy recognizes that ultimate success of the Project will depend on the ability of the groupements to manage the resources represented by the irrigated perimeter.

2.1.4

3. The relatively low number of hectares under irrigation at this time should not be interpreted as failure. It does signal serious problems in implementation. However, the past few years have afforded opportunity to SAED and the villages to experience the difficulties in trying to introduce irrigated agriculture in the area. A sufficient number of villagers appear to be convinced that the new system offers rewards. The project should now build on that support.

4. A serious deficiency for the Project has been the poor quality of topographic and soil fertility and capability studies. A map showing the natural vegetation and its production per year was prepared in 1977 but it is hardly adequate as an irrigation map. Efficiency of water management is directly dependant on quality standards being maintained in the development of information and its dispersal to project officials.

5. The experimental nature of the Project should be recognized. Accordingly the implementation pace needs to be measured and deliberate while engineering, agronomic, economic, and organizational unknowns are examined and staff trained. Especially critical at this stage would be immediate attention to variety selection, cultural practices and improved efficiency of water distribution. The benefits from the project will come not from the few hectares brought under irrigation during the life of this project, but rather from replication of a refined system of irrigated agriculture in later years. The present state of the art, as practiced in Bakel, with high costs and low yields allows insufficient margin for error and runs the risk of being rejected by the producers unless efficiencies are improved. The financial and credibility crisis will come when the first generation of pump sets have to be replaced.

6. Much more attention and resources must be applied to training needs. Two levels are critical at this juncture. First, pumpists at the village level must be trained to perform maintenance and repair of the equipment under their charge. Secondly, the technical skills of SAED must be upgraded. The present level of resources dedicated to training is woefully inadequate. Ten scholarships are suggested here. Whatever the actual number decided upon, training must be viewed as building for the future and must not be constrained by the life of this project. Additionally, a team consisting of an engineer and on-farm water expert and an agronomist should be brought in to train on site the group presidents and water masters in water management techniques.

7. The life of the project should be extended for another three years to 1984. AID mission personnel should actively pursue a more active role as full partners in implementation as opposed to the present role of financial agent.

The intended project target of putting 1800 hectares of land into production has not been reached. However, while production at existing perimeters has been improving, it is not yet optimal because of insufficient technical studies and consequent errors in perimeter design and construction. Moreover, technical packages for the various crops have not been well developed and extension work is insufficient to disseminate what is already available. Farm-level record keeping systems to monitor production and inputs are not in place to provide management data to enable decision-making by either farmers or technical personnel.

While it is acknowledged that the changes from dieri and oualo cultivation necessitate a long gestation period, there is no hard information on either the cash position of the farmer or of his, or her, ability to continue irrigated agriculture without subsidies, direct and indirect.

It is the conclusion of this evaluation that the shortfalls in hectareage and productivity are primarily the result of failures of the implementing agencies to deliver technical assistance and materials in sufficient quantities and at appropriate times.

Responses to this failure could center on increased institutional support to SAED, the agency ultimately charged with delivering training, construction assistance, inputs and marketing assistance to the farmers. However, there is compelling evidence which points to other non-public groups as potential recipients of project support. As recommended below, this will require increased training for SAED employees, improved organization in their implementation functions and better data with which to support program decisions. To make this possible the management relationship between SAED and USAID must be improved to facilitate the execution of the terms of the original project agreement.

Until such time as SAED is capable of mastering the related management functions, the rate of expansion of new small perimeters should be curtailed.

Recommendation 1 -- General

Rapid expansion of the land under irrigation should be stopped until this very promising technology is refined for the water short regions of Senegal. With the existing groupements assisting as active participants in the process, careful, deliberate applied research should be conducted on engineering, agronomic, economic, and organizational questions. Without cutting back on areas already in cultivation, and allowing for modest increases in some cases, the groupements should serve as living laboratories, helping to refine the technology before mistakes push costs to the point where the technology becomes

2.1.6

unprofitable for the farmer and uneconomic for the State. The Project thus should serve as an applied research effort before rapid expansion in the Project area and in other areas along the river.

Recommendation 2 -- Agronomic

Provide assistance to the national research service to help them focus on the problems of the arid and rainfed crop areas.

- o Help make pest controls more readily available.
- o Support research on water consumption.
- o Make immediate contact with the USDA/AID plant introduction project and ask for research samples of vegetable and farm crop seeds adapted to the hot arid regions of California, Arizona, New Mexico, and Texas for trial and increase.
- o Conduct research on the best place to use farmyard manure. It is now used on rainfed land. Should it go on irrigated land?
- o Immediate contact should be made with those international centers working with irrigation and rainfed agriculture to obtain assistance in developing better cultural practices, tools and varieties.

Recommendation 3 -- Engineering

a. Assist or support SAED in starting a training program for pump operators, assistant pump operators, mechanics, and assistant mechanics on the operation of the pump and engine; fuel and oil handling; daily, weekly, and monthly maintenance procedures; identification of troubles; authorized field repairs; procurement and care of spare parts; and off season storage.

b. Training of a water master and assistant water master for every perimeter. At present, this job is usually done by the president of the perimeter. Training should include land leveling, ditch and border construction, dike construction, compacting techniques, water control, use of measuring flumes, water guiding and field spreading, water needs of crops, production of irrigated crops, etc.. Most of this training should be done at Bakel on-the-job.

c. Encourage SAED to pull in surplus pumps and pipe and remove pumps from the very small perimeters operated by one man only or where no effort is being made to expand small perimeters after the second or third year.

d. A small research effort should be mounted to test various pipe materials under Senegalese conditions, determine the most efficient speed for engines on the different models of pumps, develop concrete or other turnouts, gates, ditch blocks or dams, etc. to help the members of the perimeter build, operate and maintain their system. A research system is needed for long term monitoring and decision making.

e. Plant a few windbreaks with fast growing trees and test their efficiency for water use, temperature control and stopping of crop dehydration by hot winds.

f. Make improvements in the pedal thresher (such as staggering the spikes on the cylinder, remove blockages from back, reduce weight and price, etc.). Contact should be made with the outreach personnel of the International Rice Research Institute (IRRI) for help in adapting light, effective equipment.

g. Work needs to be done on developing a suitable flotation unit. Both the metal and the fiber glass units are breaking up because of the small support area for the pump, the vibration of the engine and collision with floating debris. The use of wide timbers to support the weight, heavier plywood put together with marine glue to frame the fiber glass and rubber mounting pads might help absorb the shock from the running engine.

h. Obtain the rice hullers and polishers which will be needed soon to take care of the Bakel production.

Recommendation 4 -- Economic

a. Closer attention should be paid to operating procedures for the credit extended to groupements.

b. The system for accumulating capital to replace the pump sets needs to be closely examined. A direct loan program for replacements should be considered.

c. The price policy for rice and fertilizers should be re-examined.

d. Steps should be taken to limit the hectarage of each perimeter to a maximum of about 50 hectares and limit the number of workers to about four to six people per hectare. It is likely that irrigated farm size, to be economic, should be about two hectares and the number of people, to be manageable, should not exceed 100 to 125 per perimeter.

Recommendation 5 -- Sociological

A systematic data collection and monitoring system should be instituted in a few carefully chosen villages for an entire agricultural cycle. This would allow for an impact evaluation of irrigation technology on the local social and economic networks.

Recommendation 6 -- Implementation

1. An AID audit of the Project should be conducted soon. There are many areas, especially those concerning the transfer of funds, that require clarification.

2. The formal relationship defining the roles of the expatriate advisors, the AID Project Manager, and the SAED Project Director in Bakel should be established. The technical assistance part of the project should be fully staffed and working with the farmers.

3. A special arrangement should be established whereby USAID becomes the agent for procurement of small items for the Project. The USAID Project Manager and the SAED Project Director in Bakel would jointly authorize such purchases.

4. The cost of engineering studies completed by SAED staff has been charged to the USAID grant. The reasons for this practice should be clarified. It would appear that the cost of such studies should be borne by SAED as part of their contribution to the project.

5. SAED should be impressed with the need to increase the efficiency of its supply program and of the pumping and irrigation operations.

6. Improve the living conditions of staff at work in Bakel - power, amenities, housing, transportation, etc..

7. The storage area should be improved. Fertilizer, pumps, pipes, and other material are exposed to the weather without protection. They must be put under cover and fuel barrels should be tipped or stored off the ground.

III. Analysis

A. The Agronomic Aspect of the Perimeters

In the original Project Paper, and subsequent analyses of the project, the question of the technology for control of water supply was treated as if all engineering and agronomic questions were answered. In the field it is clear that this is not the case. Pump sets are in place, water is delivered, seeds planted, fertilizers applied. But breakdowns are common, the layout of the ditches inefficient, variety selection incomplete, fertilizer application not adapted to soil fertility, and use of pesticides almost non-existent. As a result, yields are low and costs are high.

Observations indicate that a great deal of improvement can be made in production techniques. As farmers gain experience, yields are reported to be increasing.

<u>CROP SEASON</u>	<u>RICE</u> T/HA	<u>MAIZE</u> T/HA
1975-76	2	1.67
1976-77	2.2	2.00
1977-78	2.7	2.50
1978-79	3.7	2.50
1979-80	3.8-4.0	2.50

Average yields on irrigated land could be much higher, especially with rice. Many farmers claim they are getting 5-8 tons per hectare. It is believed that with a relatively small investment, most farmers could double yields of the present crops as well as introduce new crops with a much higher cash value. But, changes in varieties and cultural practices would be required.

A number of observations were made concerning specific agricultural issues. These issues are at the center of efforts

to consolidate production and financial progress before further perimeter expansion.

1. Water Control:

The lack of adequate water control is probably the single greatest constraint to high production in the Bakel region. It stems from many different causes:

a. Lack of leveling of fields. Most farmers are using a form of basin irrigation and even though the basins are small, sections of each could be seen suffering from a lack or excess of water because of inadequate leveling.

b. Soil not suitable for rice production or not puddled prior to planting. In some of the perimeters, the farmers estimated that as much as 40% of the perimeter was too sandy for good rice production.

c. Whole perimeter not leveled. In several perimeters, the farmers reported that they had not been able to get water to parts of the perimeter because the ditch was too low or they had to cross a low swale in the center of the field. The majority (water channels and swampy areas) do not refill during the rainy season.

d. The pumps, pump operators, mechanics, pumps and SAED are not reliable. The farmers tend to lump SAED in with all other factors affecting the water supply. Part of this is justified because sometimes the fuel and oil are late, the mechanic does not come when needed, spare parts are not available, or the pipe breaks. However, much of this problem actually is the responsibility of the village. The pump operator does not always stay with the pump so there are frequent breakdowns. Farmers may not want to irrigate at the same time so the pump has to be restarted many times to do the individual small plots. Proper protection is not given to the fuel and oil supply. Training programs have been given for mechanics in the central shops but apparently little training has been given on field stripping engines and maintaining a high degree of cleanliness.

e. The farmers do not know how to manage their water nor do they have the tools to do a good job. Most of the farmers who were observed irrigating just let the water "run" rather than guide or conserve it. Ditches and bunds were leaking and most basins had more water than the maize crop could usefully use. Many farmers reported that they did not have shovels to control their water. Many of the ditches were filled with weeds and dry weed pods.

f. Temperature and air movement control. Not much can be done to control either temperature or air movement. The winds

and high temperatures cause the sensitive, delicate growing points of the plant to dehydrate. This is serious at any time but especially during pollination and seed setting time. Providing windbreaks and irrigating lightly and frequently during this critical period may help to reduce temperatures 5 or 6 degrees, enough so that fertilization can occur.

2. Crops:

Farmers in the Bakel region have grown food crops such as rice, maize, millet and a few vegetables. The common characteristic of these crops is that they are all low priced at the farm gate. If this continues, it is unlikely that the region will ever reach its full potential or that perimeters will be fully utilized. With the security of an assured water supply, the introduction of higher value crops would raise farmers' income. The production of small quantities of unrefined sugar, cotton for home industry, fruits and vegetables carefully selected for soil should be tested.

The original SAED policy of rice production and marketing has been resisted by some farmers on the basis of the relative profitability of maize and of their greater ability to handle maize production practices. Some maize is sold green at a price as much as four times greater than the price for dried corn and above that for rice.

Production shifts are further explained by:

- o the unsuitability of some soils for rice;
- o the greater familiarity with maize production;
- o greater consumption of maize compared to rice.

3. Fertilizer Program:

It was not possible to discover the basis for the fertilizer recommendations now being used but indications were that it had been developed by the National Research Service and had been tested in the area. Evidence in the field indicates that SAED recommended levels may be too heavy for some areas producing only one crop and not heavy enough where two and three crops are grown. Allowances were not being made for the type of soil or previous soil treatment.

While SAED asserts that all farmers follow the government's recommendations and buy fertilizer on credit, the sales of fertilizer for credit in 1979/80 would not fertilize the crops reported grown in that same year at the recommended rates.

Fertilizer Sales and Requirements for 1979-80 Crop Year (Bakel)

	<u>Urea</u>	<u>Mixed</u>	<u>KCL.</u>	<u>Total</u>
Tons Recommended-Rice	33.75	33.75	22.5	90.0
Tons Recommended-Maize	65.60	49.20	32.8	147.6
TOTAL	99.35	82.95	55.3	237.6
Tons sold on Credit	<u>59.35</u>	<u>41.95</u>	<u>46.55</u>	<u>148.15</u>
Tons sold for cash or not used	<u>39.7</u>	<u>41.0</u>	<u>8.75</u>	<u>89.45</u>

The above figures are based on the total hectares reported planted: 225 hectares of rice and 328 hectares of maize. These figures constitute reasonable cause for an audit on the project to determine whether the farmers are actually using the recommended amounts of fertilizer and, where it is coming from.

The team therefore concurs with the IBRD recommendation that fertilizer subsidies need to be reviewed.

4. Pest Control:

The farmers of Bakel are aware of the pests affecting their crops and they seem to be willing to take appropriate action against them. Pests include rats, birds, diseases and weeds. Some measures are being taken in some perimeters.

5. Crop Rotations:

The farmers are doing some rotating of their fields by leaving them fallow or by alternating plantings of rice, maize, cowpeas or vegetables in them. More effort needs to be made to find suitable crops to use in the area to help in the control of weeds, insects and diseases. Cowpeas and other leguminous crops should be tested both as a food/feed crop and as a fixer of nitrogen.

6. The Rain-fed Areas:

The rain-fed areas still supply the great bulk of the villagers' food supply and will continue to do so for the foreseeable future. They will continue to compete with the irrigated areas for labor and for family inputs. Although the project paper calls for limited assistance for dryland farming it appears that the lack of rainfall over the past few years has negated even limited attention. There are a number of possibilities that should be pursued: new varieties having a short growing season; the use of fertilizers and soil conditioners; alternative crop and forages.

The project staff should make a contribution to the agriculture being done on both sides of the dike.

III. B. The Engineering Aspect of the Perimeters.

The project is awaiting the arrival of an irrigation engineer. It is unfortunate he was not the first technical expert on the scene since many of the problems deal with engineering questions rather than agronomic or economic ones. One of the major problems facing the farmer is the control of water, which is basically an engineering problem. If water can be controlled, it would be possible to double present yields and ancillary investments would pay off.

Several deficiencies were also noted:

- o The lack of protective dikes that were proposed to protect against river and runoff inundation.
- o Insufficient assistance in land levelling and filling.
- o Insufficient topographic mapping and surveying for preparation of fields.
- o Lack of assistance in stump removal.
- o Improper use and maintenance of pumps and related equipment.
- o Inefficient use of pumping capacity and lack of water control mechanisms.
- o Less than full use of pumping capacities.
- o Lack of technical assistance in earthworks construction and reinforcement.
- o Lack of training for pump operators and mechanics.
- o Lack of proper tools for pump operation and maintenance.

Water technology is still in the developmental stage. While enough is known to recognize the promise, the field adaption period allowed by the project for refinement of this technology is not sufficient.

III. C. Economic Consideration

Economic Analysis

A critical measure for any project is expected financial gain which in this case represents the return that participating farmers can expect. This calculation is an estimated average and the analyst attempts to insure that, at a minimum, the activity's rate of return is competitive with other alternatives available to farmers. In the project area, the irrigated perimeters are but one of several economic activities that compete for available labor, land and capital.

In the Bakel Project, there is ample room to question the reliability of the data base and, by extension, the economic analyses conducted to date. This judgement is based on the difficulty of obtaining information on key variables, such as

- o Labor coefficients are not available for the technologies

employed. Quick survey methods are an inappropriate means of estimating these critical variables.

- o Yields from fractionated plots can be expanded to a per hectare basis only with extreme care. The 3MT/ha. of rice estimated in an earlier report contradicts information that suggests that yields 4MT/ha. - 5MT/ha. are not uncommon and 8MT/ha. should be possible.

- o Cost data for purchased inputs should be easy to obtain. They are not.

- o How resources are combined, the state of the technology used in this project, is in a state of evolution.

The final test for any new activity is made by the farmers themselves. If a production activity does not pay, as measured by the farmer, it will be abandoned. For the Bakel Project, the strongest testimony to date is that the producers appear to have a strong, continuing interest in irrigated agriculture.

The review of the most recent attempts to calculate the expected economic return from the Project included one showing negative internal rates of return while an earlier financial analysis indicated low but positive rate of return. The difficulty with these attempts, apart from the weak data base already mentioned, is that the analyses are static in nature. That is, they examine one moment in time of a dynamic, continuous process.

Control over water represents a structural shift in the economy of eastern Senegal that is still unfolding. Static analysis cannot capture the full expected impact of the change. This new power over water permits a broadening of economic alternatives that is difficult to foresee. A static analysis captures only the first order benefits tied directly to the catalytic change. Experience tells us that second order benefits, such as induced employment generation, are often more important than the original, expected results.

2. Price Policy

Rice, the crop most encouraged by the Government for the Senegal Basin, is underpriced at the farmgate. According to a recent World Bank study, the farmgate price is calculated on the basis of the CIF price of imported broken rice from Thailand. Normally this rice is priced at about 40% of whole rice. The farmers in Bakel are producing a quality long grain rice. The derived price of 41.5 CFAF per kilogram of paddy undervalues their production. Rough calculations indicate that the price could be increased up to 70 CFAF per kilogram of paddy and still be below the CIF price for rice of comparable quality.

This undervaluation is partially compensated for by fertilizer subsidies. In the same World Bank study, it was estimated that subsidies have accounted for as much as 50% of the price to the farmer. We agree with the World Bank recommendation that

this policy be re-examined. There are two major dangers in this policy. First, it encourages use of fertilizers beyond its economic value and second, it has the potential of transferring a significant portion of the private costs of production to public institutions.

3. Loans

There are two loan programs in use. The first extends short-term, in-kind credit to the groupements to cover seed, fertilizer, and operating expenses for the pump sets. Repayment rates have been high, since SAED refuses continued service unless current debts are retired. In a quarterly report for the period ending September 15, 1979, eight of the groupements had repaid 100% of their accumulated debt and four more had paid in excess of 90%. The participants clearly understood the policy. SAED was unable to fulfill a request for status of current debts, indicating it would require several weeks to complete. If SAED cannot quickly respond to such a request, how can farmers attempting to pay be given an accurate state of their account? As loan payments are made in cash, very tight and responsive controls have to be in place in order to inspire confidence in SAED as a fiduciary agency. There is little reason for such confidence at this time.

The second loan program covers the capital costs of the pump sets. The current contract required groupements to deposit the estimated amortization costs - the cost to replace the pump sets - in a special account where SAED would have joint control over deposits. While hard data is not readily available, it is generally understood that payments are not being made by the farmers for several reasons:

- 1) The suggested payments are very high. The economic life of the pump sets should extend well beyond the five years presently estimated. If this turns out to be the case, then the amortization payments would be considerably less.
- 2) Turning money over to the joint control of a government agency new to the area is asking a lot.
- 3) The economic feasibility of pumping water is still being tested. The villagers reserve judgement before risking their money.
- 4) Much of the wear and tear on the current set of pumps and motors is a result of poor operating procedures and maintenance practices by both villagers and SAED mechanics. The State should share some of the cost of this on-the-job training.

D. Sociological Aspects

Of the 30,760 residents of villages currently participating in the irrigation project, 3,317 are actually members of the "groupements" of the perimeters. Among this 11% involved directly

in irrigated agriculture one-half are men, one-half women. Nine perimeters have no female members. It appears that only a small portion of each village is represented.

Observations made in Bakel showed no indications of explicit discrimination in access to resources or distribution of benefits. The overall picture is one consistent with the performance of the traditional system.

Local land tenure systems are not consistent with the nationalization policy. Land disputes in the Bakel area are few, but this problem is likely to become more acute. In the few villages observed it was clear that historical village land rights are known and respected: In one case, the expansion of the perimeter in Guitta, the use of land traditionally held by families from Senedebou, required the agreement of a second village.

2. Mode of Production

Current production practices in the irrigated perimeters include individual and group organization. At the time of initial SAED involvement, there was already interest in collective production in many of the Soninke villages. This collective concept was initially extended throughout the 24 villages by SAED but met increasing resistance, particularly in the Toucouleur areas. By now, most of the villages, have adopted an organizational pattern that includes a small communal plot - often 1/6 to 1/3 of the total area irrigated.

A motivation for retaining collective production is that farmers use the proceeds to pay the collective debt owed to SAED for the basic inputs and operating expenses. In practice, however, most collective yields are insufficient for these repayments. Farmers thus have to contribute the difference. The current balance between collective operations and individual production appears acceptable to both the farmers and the local SAED staff. The village organization has evolved independent of any overt interference from SAED. Farmers have found that irrigation production can supplement their traditional fields to fulfill subsistence needs. Through irrigation they see an opportunity to not only improve their standard of living, but to acquire reserves to be put aside for the lean years. They do not want their children to go hungry or suffer from malnutrition.

On various perimeters the farmers looked upon the success of irrigation farming with mixed feelings: Some farmers were reported to have left their groups; some groups were smaller than when formed; some farmers were fearful of going further into debt; others had decided that their time was better spent working on their rainfed land. However, the average size of each perimeter has grown over the years: the first year the average was

5.8 hectares increasing to 12.2 hectares for the 1979-80 season, and enough land is now cleared, but not leveled or ditched, to irrigate 17.6 hectares per perimeter in 1981-82. The number of people involved has increased from 64.5 per perimeter, a total of 1614, to 132 per perimeter for a total of 3,317 people.

In the project paper, it was planned that each perimeter would be from 20 to 50 hectares in size allowing each family 2 hectares. Ten to 25 families and 40 - 100 workers would be working in each. Present developments belie this intent; in most of the perimeters individual workers are authorized one plot of 0.2 hectares or less; in other perimeters the plots are less than 0.05 hectares. Only two perimeters authorize plot sizes larger than 0.3 hectares. Balou is the only perimeter larger than 50 hectares. Of its 55 hectares developed, twelve are reserved for collective production and the balance of 43 hectares is divided among 620 workers.

The villagers appreciate the significance of making the perimeters as large as their pumps can irrigate because it lowers average pumping costs and allows each person a larger piece of land. Large numbers of people in a perimeter increase management difficulties and reduce efficiency.

Other villages want to start perimeters and are negotiating with SAED for pumps and help to organize. Concurring with the World Bank, as expansion of the perimeters occurs, the size of area awarded to a family should be increased to an economic size of about two hectares, total membership should be limited to a manageable 25 - 30 families. This would require setting up more perimeters and groupements. All of this shows that, in spite of numerous complaints about the performance of SAED, having to pay back the money received on credit, the farmers in the perimeters can and do work with the system. If a conscious effort is made to improve efficiency, improve cropping patterns and make the water supply more secure, interest in the project will continue to increase.

3. Emigration

The current pattern of migration intra- and international fulfills an important economic need that has prevented a decline in living standards. There is no evidence at this time that irrigation has met the same need, nor do the villagers expect it to do so in the near future.

E. Institutional Analyses

1. SAED: As explained by the GOS Project Director in Bakel, it is the intent of SAED to 1) enable each village group to assume more of the management; 2) rely on private sources for the supply of inputs, especially fuel, and 3) assert its role

as government representative for the Basin and as primary source of technical assistance.

SAED as provider of project inputs, shares and exhibits the same difficulty as most public institutions, specifically in adhering to cumbersome procurement regulations for obtaining commodities for distribution. These time consuming procedures have been compounded by recent budgetary crises for the government which slows and often stops procurement even though funds are available from independent (e.g. AID) sources. Little advantage has been taken of foreign financing to hasten procurement.

Project management is through a GOS Project Director. The area is divided into three zones running parallel to the Senegal and Falamé Rivers. Each zone is headed by a chief and support staff which consists of a mechanic for repairs and servicing, an input supply person, and village level animators.

Government budgetary difficulties have prevented full staffing in some zones though all chiefs are in place. The technical competence of some personnel is clearly below that desired.

The Project Director, his assistant, and the zone chiefs hold technical degrees equivalent to approximately two years of university level study in the United States. The village level promoters are trained locally. SAED relies on other public institutions for more detailed and technical backstopping.

Three training programs for SAED have a direct bearing on the Project and are underway or beginning. The French are supporting one program in Bakel to train village level promoters. AID is sponsoring a major training project designed to enhance operation and maintenance of centrally managed machinery and UNDP is sponsoring a foreign advisor for one year to train village level mechanics and pump operators.

2. USAID: The role of the AID mission in project implementation is fairly easy to identify. Through Project documents, files, and interviews, it is clear that USAID has attempted to distance itself from active participation in implementation. From the inception of the Project to the present, AID has acted only as a source of funds, not as an active partner in the continuing development of the Project. Other donor agencies apparently participate to a much larger degree in project implementation. It was not evident during the evaluation that SAED would object to a more active role by AID.

3. Village Groupe (Groupements): The village groups are the primary and critical players in the project. Individuals from different families form the groups. Participation of village

members varies considerably, from 2.6% in Guitta to 45% in Senedabou.

The extended family, apparently, is the primary decision making body allocating labor to different economic activities. The irrigated perimeter group is now another alternative.

Village groups have demonstrated considerable skill in managing Project resources. For example:

- o how much of the perimeter will be in communal or individual plots;
- o how borrowed resources and debt is fairly apportioned and collected;
- o during water shortages when cultivated land is abandoned, how restitution is made to the satisfaction of affected parties;
- o individual plots are assigned and the villagers have the right to exchange or to sell them on the condition that they must be worked;
- o work groups are formed to handle communal production plots as well as non-divisible activities such as ditch construction and maintenance. Every farmer must participate or pay a penalty.

4. The Federation. The Federation of participating groups, centered in Koungani, has played a continuing role during the life of the project. The original contact by foreign technicians was facilitated by the federation; only later was SAED brought in as the principal institution for introduction of water management. Although not formally assigned this role, the Federation has acted, in effect, as a major negotiator concerning contracts, purchase price of rice, costs of inputs, and modes of debt management.

5. Private Institutions in Bakel. In Bakel, cursory first hand inspection confirmed what was related by several parties: the private sector is not now capable of providing the necessary services for the Project. Seeds, fertilizers and pesticides are available only through government agencies. Diesel fuel and spare parts are available only from Matam, a three to four hour trip during the dry season. The local market does not appear to be capable of absorbing large quantities of grains even for transshipment. Vegetable and green corn marketing are done by the individual producers, if not within the same village, then within neighboring villages. One outside buyer of tomatoes and corn from Tambacounda was reported by a village on the Falame River.

IV.. Specific Analyses: Implementation

A. AID Funded Commodities

1. Pump Sets (floaters, 60 m. of pipe, pump and motor) are at the heart of the Project. As of April 1, 1980 pump/motor sets had been purchased and delivered and another are already on order.

Mismatched motors and pumps are often installed at perimeter sites. This causes performance failures. Although the precise cause is in dispute, 100% of the pump sets have failed. Project technicians state that the low revolutions per minute forced on the motors by the pumps caused the motors to burn up. The supplier cites poor maintenance as the cause. Regardless of reason, the supplier is refusing to honor the guarantees.

Serious difficulties have been encountered with the pipes. Leaks are common, and some installations were faulty. Exposure to the sun appears to be causing complete deterioration of the pipe within two years.

2. The purchase and use of vehicles has been a continual problem for the Project. Through waivers several Peugeots and Land Rovers were purchased: a Peugeot 504 luxury sedan for the Project Director; two Peugeot 404s for the technical staff. Although the receiving and certification reports were signed by SAED officials only the 504 and one 404 were delivered to Bakel. Following the evaluation the other 404 was finally delivered there.

Of the two Land Rovers purchased, one was under the contract with the original technical advisor from CIDR and was impounded by Customs when he left. It could be used by neither SAED nor expatriate technicians. It has been used, however, as a source of spare parts (the motor was removed).

Two trucks were budgeted; the five-ton truck was on site and the 7.5 ton truck only arrived in late April.

Two vehicles are being purchased for the project expatriate technicians but there is concern on their part as to who will control their use, once they arrive in Bakel. Access to vehicles has been a continual problem. Cars carrying GOS license plates come under the nominal control of the Prefct in Bakel and Project vehicles have been commandeered in the past.

To provide access to the villages during the rainy months several boats and motors were also purchased. The consensus of technicians at Bakel is that the boats are too elaborate and their motors consume too much fuel.

3. Office equipment and furniture, as well as household goods for technician housing, has been purchased and is on site. (Construction of houses and offices started about April 1, 1980.) SAED has rented temporary offices and housing and uses some of the equipment and furniture. The Project Director noted an imbalance in supplies with enough beds to sleep all of SAED, but only three desks.
4. Commodity procurement has been a complicated affair. A mixture of USG regulations and the GOS procurement rules followed by SAED has been employed at various times during the past three years with consistent results: delays are common and commodities are not available when needed.

The original tranche of procurement was done by AAPC, the SAED contractor, for pumps, motors, pipe, office furniture and equipment, and household furniture. The pumps arrived after the onset of the rainy season, missing one entire cropping season. AAPC continues to make major purchases.

A special arrangement was set up by AID and SAED to handle local procurement of items valued under 3,000,000 CFAF (\$15,000). In a lengthy, complicated process, it takes at least six months to place a certified order with a supplier. Depending on the item, an additional six to nine months may pass before delivery. Compounding this process has been the recent budget crisis of the GOS which has reduced even further the ability of SAED to procure project-related materials even though funds are often available from the AID Grant.

A special revolving fund was established with an advance from AID; replenishment of funds spent is secured by presentation of a listing of checks drawn against the fund. There is no AID review of expenditures to determine administrative or legal allowability. Given the difficulties inherent in this type of fund, a formal audit should be conducted before the project ends. An expatriate advisor to SAED headquarters considers use of this fund illegal and has successfully blocked all attempts to use it.

B. Technical Assistance Roles

After the departure of the original technical assistant (CIDR) a hiatus of about 12 months ensued where none was available. In March, 1979 a short-term advisor was brought in for a period of four months. He then agreed to a longer term contract which began in November, 1979. Two other expatriate technicians have agreed to work in the Project; one arrived in December, 1979 and the other is scheduled for summer, 1980. Collectively these technicians bring training and experience in skills which are needed by the project; rice production, extension, horticulture, agronomy, and irrigation engineering.

2.1.21

There is an on-going dispute as to the formal role of the expatriate advisors who have Personal Service Contracts (PSC) with AID. From their point of view they are employees of the United States Government, which is specified in the contractual arrangement with AID. However, after their arrival they were advised by USAID that they should consider themselves employees of SAED. SAED would be responsible for most of their logistical support as well as for technical direction. The same information was given to SAED. The Project technicians hold opposing positions: they were hired as employees of the USG and as such cannot be expected to take technical direction from SAED.

The position of SAED is difficult to ascertain. While it is clear that the Project Director is the recognized authority in Bakel it was not clear whether he would object to a more collegial relationship with the USAID technicians. It is related that SAED's central office believed an amicable and productive solution could be worked out by the principals in Bakel.

The relationship between foreign advisors and host country management is not easy to define. In practice, the strength and productivity of the relationship depends more on interpersonal communication rather than formal definition of roles. However, the formal structure is also important.

The expatriate advisors possess technical skills and experience not available within SAED. As advisors they are expected to have a degree of independence which allows for disagreement on technical matters, without implying a rejection of the authority of SAED. If they were line employees of SAED there would be little room for this.

It is proposed that a new formal mechanism be established to redefine the role of the expatriate advisors. The AID Project Manager and the Project Director in Bakel should be named as formal counterparts. The expatriate advisors would then be under their technical and administrative direction. The Project Manager and the SAED Project Director would agree on the scope of work to be carried out by the expatriates in connection with the Project as managed by SAED. It must be made clear that the authority of the Project Director in Bakel would not be challenged. But in the case of disputes or disagreement the AID Project Manager becomes the relevant party with the Bakel Director to resolve such disputes. This will avoid direct confrontation between the SAED Director and the contractors.

Agreement should be reached with SAED for AID to do procurement of shelf items and other small items needed for Project implementation, especially for those costing less than \$2,500. Joint approval of the Project Director and the AID Project Manager would be required for each purchase. AID procedures offer much greater flexibility and speed than available under

SAED procurement regulations. Such a procedure would provide the AID Project Manager another opportunity to participate in a meaningful way in Project implementation.

C. Construction

The Project Agreement allots funds to construct office buildings, warehouses, and living quarters. Construction work has just begun. The contractor is still finishing work on the Bakel Livestock Project started three years ago. He is, it was reported, the only one available. Supervision for the construction will be carried out by SAED personnel.

Other construction activities related to the irrigated perimeters are land clearing, stump removal, and dike construction. Demand for the first two clearly exceeds SAED's capacity. Dike construction falls far short of that indicated in the Project Paper. Only one dike was seen. Reportedly, it was breached during the first year but rebuilding and improved maintenance by the villagers prevented a repeat in the second year. If dikes are necessary, as was strongly presented in the Project Paper, then they should be built as rapidly as possible. Apparently faulty engineering studies by SAED is a primary cause for the delay.

D. Training

Provision for training at all levels was largely ignored in the original Project Agreement. Only \$49,000 was obligated for this purpose. Direct support for upgrading skills of SAED personnel in agronomy and water management is limited to one student in the United States with the expectation, as yet unconfirmed, that the deputy to the Project Director will be sent as well. He has not received formal notification of selection or departure. An AID financed training program for SAED personnel to upgrade mechanical maintenance and repair skills has just begun.

E. SAED Contribution

SAED's contribution to the Project is represented by salaries, construction costs, rent and other miscellaneous expenditures. Technical staff of SAED are responsible for topographical and survey work. The Project Paper mentioned that about fifty percent of the necessary survey work had been completed before the Project was approved. The cost for some of these services is charged against the AID contribution. The reason is not clear, and should be investigated.

The Project staff reports that the work performed by the technical divisions of SAED is of extremely poor quality and in many cases unusable. Perimeters were constructed with faulty information on soils and slopes and water delivery systems are correspondingly inefficient. It is planned to use Project funds (about \$300,000) to repeat much of this work.

THE RURAL HEALTH COMPONENT OF THE SMALL IRRIGATED PERIMETERS PROJECT (685-0208)

The introduction of irrigated agriculture involves environmental changes which can affect the incidence of diseases in an area. Vector-borne diseases associated with water, such as malaria, schistosomiasis, onchocerciasis, and intestinal parasites occur in the southern portion of the Sahel. Water-related development projects often create excellent breeding habitats by which the spread of these vector-borne diseases can expand.

The goal of the Bakel Health Project is to "maintain in the irrigated perimeters region the existing health level and, if possible, improve it." To this end, two health activities -- a health surveillance element and a village health services program -- were incorporated into the crop production project to counter the effect of the possible additional exposure of the population to water-borne diseases.

Of the \$6,575,000 funding for the Bakel Irrigated Perimeters project, \$407,000 has been budgeted for the health component, over the project's five years (1977-82). SAED has accepted the health component of this project but has done nothing to integrate it.

It should be noted that the Health Project is a five-year project which has been underway for almost three years. The health surveillance activities were started in April, 1978. However, the health services activities were delayed until March 1979, when an AID technician was hired to work in Bakel, essentially implementing them only during the last year.

A. Health Surveillance Activities

The purpose of the health surveillance project is to collect and analyze data relating to the incidence of parasitic diseases in 25 villages (23 villages in the project plus two other villages for control purposes). An initial census of the population of these villages was done by Dr. Samba Diallo of the Service de Lutte Antipalustre (SLAP). Two subsequent surveys were to be made each year, one at the end of the rainy season and one during the dry season. This data would help to identify trends in the incidence of disease in the irrigated perimeters.

Of the \$295,000 budget, \$125,000 was budgeted to Dr. Diallo for data collection and \$20,000 for miscellaneous equipment - including a vehicle for the health surveillance team. The other \$150,000 was budgeted for consultancy assistance to establish a surveillance program; monitor field surveys and analyze results; and, at the end of the fifth year, to conduct an evaluation of the health component of the project.

To date, the health surveillance team has conducted the initial census and four of the ten biannual surveys of the villages. A first report "Premièr Rapport sur le Recensement des Populations et le Dépistage des Maladies Parasitaires Endémiques" which covered the spring 1978 survey, was submitted to AID. The census was conducted in fifteen villages; the remaining eight have yet to be done.

Since the final output of the health surveillance is to be tabulated and analyzed, it is premature to assess the validity or relevance of these reports to AID's goals. Nevertheless, several problems became apparent.

- o There has been no regular monitoring of Dr. Diallo's activities by USAID.
- o There has been no integration of the microscopic training of the four nurses with the health surveillance of the villages.
- o No correlation is being established between the health survey and the development of irrigated perimeters. When the surveillance team conducted the census and initial survey they did not collect entomological information with respect to malaria, schistosomiasis, and onchocerciasis, though the initial purpose was to do just that.

Using the existing design it is impossible to determine if the change in the incidence of disease is caused by the irrigated perimeters or by other factors.

B. Village Health Services

The purpose of the village health services program is to "strengthen existing medical services in order to improve diagnosis and treatment of endemic diseases, and to provide health and sanitation training in the villages." This includes:

- o Training dispensary nurses in microscopy, and education of village health workers.
- o Training of 23 village sanitarians, and 23 maternal/child health workers.
- o Training of village first-aid workers for those villages lacking dispensaries.
- o Establishment of 23 self-supporting village health huts.

The implementation plan as presented in the Implementation Letter stated that eight nurses and twenty village health workers would be trained. It also included the construction of pharmaceutical warehouses in Tambacounda and Bakel.

The type and quantity of medicines for the project was established by the RHO. Delivery has been slow for all commodities, partially because of the difficulty in procuring small

quantities of drugs from the United States. Three drugs have not yet been purchased, nearly two years after the PIO/C was issued.

In general, though project officials concur on the targeted training of village health workers and the establishment of village pharmacies, uncertainty exists concerning the institutionalization of this village health system. There is confusion over the resupply of medicines and the training of village sanitarians and maternal/child health workers. This is the result of the failure of AID to prepare amendments to project documentation.

Four nurses initially received training in microscopy and in training village health workers, but one has left the project. They have trained ten village health workers. Eight trained VHWs are now working at the village level extending primary health services into five new villages.

Promotion Humaine has worked with the project technical assistant to organize villages and establish the village management committee. Each village is supposed to establish its own policies of pricing and remuneration. This approach has created management uncertainties which could threaten the contribution of post-project VHW activities. No village has yet established a capacity for continuing VHW activities. They are dependent on project resources even though they have accumulated a significant amount of their own cash through the sale of project medicines. They do not know precise resupply costs or what amount to pay for VHWs or for other village health activities. Most VHWs receive no compensation. No village health huts have been completed, but the lack of a health hut appears not to have hindered the VHWs who operate out of their homes.

An American technical assistant, hired for the project, has been involved in project management as well as technical assistance. The continuation of project activities will require VHW activities to be less dependent on his managerial activities, yet his efforts are crucial for starting village health huts and giving them operating guidance. To date his activities have been hampered by lack of transportation and administrative support.

Project implementation has been characterized by a short-term task-oriented approach. Difficulties in getting implementation tasks accomplished have caused project managers to concentrate on immediate needs and to lose sight of desired outputs and purposes.

Implementation effectiveness has also been hampered by inefficiencies in project administration. Such problems have slowed implementation and strained AID credibility with Senegalese project personnel.

In spite of a vague project design and lack of implementation planning, the project's output targets and purpose appear just. Health huts are needed and desired by villages in the Bakel Department; there is also a need to develop a better understanding of the effects of irrigated perimeters on the incidence of disease. The evaluation team therefore recommends that:

- 1) AID enlist consulting assistance to (1) compile the data on breeding vectors and (2) to assist in the analysis of survey results.
- 2) The health surveillance element should be better integrated with (a) the health services component and (b) with SAED. Integration with SAED is important if the surveillance is to collect entomological data from the irrigated perimeters to permit the determination of the health effects of irrigated perimeters development.
- 3) The project clarify how many nurses are to be trained.
- 4) It should develop a program for training village midwives and proceed to implement it. This portion of the project's training component has been ignored.
- 5) The change in the role of sanitarian activities in VHW activities be formally acknowledged.
- 6) Planning is needed for the nutrition component.
- 7) Project training and guidance should include some systems management.
- 8) The plan to create a governmental supply system should be re-examined.
- 9) In order to enhance the effectiveness of VHWs:
 - a. AID should immediately purchase the three missing drugs,
 - b. All drugs and medicines being sent to Bakel should be sent through the Project Director in Tambacounda, which he has requested,
 - c. AID should locate and distribute the missing microscope to the nurses.
- 10) The Bakel Health Project be given increased Mission support for its activities by:
 - a. Ordering commodities in a timely fashion and AID Mission personnel following-up the shipments to be certain they are received;
 - b. Including funds for AID project management in the project budget;

2.2.5

- c. Completing a project workplan for the project in conjunction with the AID project manager, technical assistant, and the GOS Project Director.
- d. Better coordination with the technical management and support service in the Regional Health Office.

11) AID must establish a uniform policy for all projects concerning the payment of indemnities to GOS project officials.

12) AID explore the possibility of using a Peace Corps Volunteer to extend project activities, particularly in sanitation and health education activities.

The evaluation team was impressed by the positive response of the villagers to the village health huts. Villagers are concerned about their health and are anxious to improve their health care facilities. Fourteen villages still do not have a VHW but in the villages where the VHWs are active, the villagers seem satisfied with the results and, in some cases, anxious to expand the VHW activities.

Survey of Project Beneficiaries

1. The survey of beneficiaries in the Bakel zone was conducted in ten of the 24 villages with small perimeters using pump irrigation, on the banks of the Senegal and Falemé rivers. Six of these villages are essentially Sarakolé and located north of Ballou. All the Toucouleur villages started this form of cultivation in 1977-1978, whereas Sarakolé villages started in 1975 and appear to have had greater exposure to this form of agriculture. The survey of 160 farmers (112 men and 48 women) was complemented by a public meeting in each village, in order to verify the preliminary results of the survey in that village and collect additional opinions and suggestions from the inhabitants. In all, 1.3% of the total population of these villages was interviewed (an average of 16 respondents per village) or 8% of the working age group.

Respondents from both ethnic groups are generally satisfied with the project (Sarakoles 59.4% and Toucouleurs 56.6%), with their desire to see the project continue in its present form, supported by the Sarakoles (36.8%) and the Toucouleurs (34%); an additional 32% of the Sarakoles and 34% of the Toucouleurs are in favor of continuation with some improvements.

2. There is general opinion that the services provided by the Bakel project are of such utility that 86% of the Sarakoles and 77% of the Toucouleurs will continue to make use of them. Women are least likely to find these services useful (37% of Toucouleur women and young people are most likely to make use of them.)

o The availability of seedlings appears to be less than satisfactory (45%) for the Sarakoles who practice a two-crop cycle and more than adequate (68%) for the Toucouleur villagers who harvest only one irrigated crop a year. The high price of seeds was raised as an issue in all villages.

o The availability of water for irrigation is very much appreciated by 88% of the total sample. However, this assessment was mitigated by observations regarding the frequent mechanical failure of pumps, their frequent need of repair, the insufficient lengths of pipes and the insufficient level of water available through existing pumps.

o The advice provided by the technical staff and the form of their interventions, is under question, in particular by the Sarakoles, but also by Toucouleur women.

o Sarakoles, in villages north of Ballou, appear to derive more benefit from the project: 23% state that they have produced a marketable surplus and 68% a subsistence consumption surplus. Among Toucouleurs, south of Ballou, the comparable figures are 7% and 40% respectively.

3. An analysis of responses regarding participation of beneficiaries in the management of perimeters reveals the rather wide variability between men and women, the latter (particularly among the Toucouleurs) having the least opportunity to participate. Beneficiaries are not informed and do not participate in the planning of each agricultural campaign, and neither are they aware of the role of the two principal groupement Federations. The management committees appear to be limited to a small number of very active participants, excluding women, and functioning very poorly as transmitters of information to the farmers of irrigated perimeters.

4. The project appears to have facilitated the workload of some beneficiaries (48% of Sarakoles and 19% of Toucouleurs). However, the nature of agricultural work has become more complex (74% Sarakoles and 55% Toucouleurs). It does not appear, however, that the project has had any significant impact on all other aspects of daily living for either men or women.

The ENEA Survey of the Bakel zone residents indicates that, in spite of SAED, a majority supports the continuation and extension of the operation. In the villages south of Ballow, women ask for the establishment of "women's perimeters" which they could manage and control.

Following are the specific observations of the villages surveyed and the groupement they represent.

Particular Issues

- a) Villages affiliated with the Sarakole Federation (Soninke)
- Galade: Soil is too sandy, not appropriate for rice production; there is a need to vary crops, especially in order to keep young people busy. Women want a millet mill.
- Moudery: poor yields; difficulties in marketing off-season vegetable production in which SAED is less and less interested.
- Tuabou: Pumping from a temporary pond; off-season crops cannot be produced.
- Doungany: SAED is strongly opposed by the villagers; its extension services are useless and lack competence; SAED cares only about its own commercial interests and is unwilling to develop additional activities.

Yafera Group: reluctant to pay back their debts in kind as the price given by SAED is low (41 CFAF) as opposed to 90 CFAF/kg for seeds. They are not satisfied with SAED's reluctance to support off-season farming; they wish to get extension pipes in order to reach surfaces already sown. Women want to have equipment to alleviate their work and are in need of small vegetable gardening equipment. The group also complains about high prices for earth works, leveling and planning by bulldozer (50,000 CFAF per hectare). They would like a health program to be established.

Ballou Group: Regrets that off-season farming cannot be done as the Falemé river runs out of water as late as March. Requests that they be given opportunity to establish profitable and continuing activities.

b) Toucouleur Federation

Senedebou Group: Complains about excessive taxes they had to pay; i.e. 2.650.000 CFAF for 12 farmed hectares with poor yields (corn). Request that assistance and extension be provided on a permanent basis. Would like to have on-site repair service for pumps in view of frequent breakdowns.

Women, who number 255, are another group. They would like to have their fields extended, be provided with a motor-pump with an extension pipe and continuing extension services to help them get organized in other activities.

Guita Group: Note that there has been a lack of organization, yields are very low in relation to efforts that have been made and changes are very costly.

Women would like to have other productive activities established and be equipped so that housework is made less tiring.

Dialiguel Group: Would like to have their perimeter expanded in order to encourage women's participation. Would like to have input prices lowered (fuel-oil, fertilizers and seeds).

Sinthiou Dialiguel: Besides the pump, SAED does not provide any noticeable assistance. Farmers would like to have women take part in perimeter farming and other productive activities established in order to retain young people in the village.

Solutions Proposed by the Groups

In order to solve a certain number of these problems, the groups made the following proposals:

- a) Establishment of a storage room for pump spare parts.
- b) Full training of pump operators in pump maintenance and repair.
- c) Training of some group members in extension work.
- d) Support establishment of other socio-economic activities; fabric dyeing, livestock, use of incense, etc..

Report of Bakel Small Irrigated Perimeters Evaluation De-Briefing

Date: May 23, 1980

Attended by: Messrs. Amadou D. Niane (DP/MPC), Rene Girouard (CT/MDR), Christian Garcia (MPC/DPS), Alioune Blaise Mbengue (DGPA/DAP/MDR), Axel Magnuson (USAID), Melvin McCaw (Deputy Director, USAID), Richard Miller (USAID), Claude Salem (USAID), Paul Worthington (USAID Project Manager). SAED and the Ministry of Health were not represented.

M. Niane, Ministry of Planning, DP, called for a short summary of the evaluation of the Small Irrigated Perimeters Project. After Mr. Salem had summarized the main points of the report on the Small Irrigated Perimeters Project, M. Magnuson made a quick presentation of the Health Sub-project.

First, emphasis was laid on the need to maintain the project's major objectives, i.e. finding ways to reduce risks from weather; methods of providing additional income to farmers; ways to reduce migration, both to and from the area. After identifying obstacles to achieving these objectives, it was pointed out that water control was thus critically important. To the extent that the system is put in place and locally managed, project goals can be accomplished.

A major finding of the report was that plans for perimeter expansion should be slowed until it was sure that proper irrigation specifications were known and SAED was equipped to do adequate supervision of construction. When this conclusion was questioned it was explained that some results were good (4 T/hectare) but that much land prepared could not be used because of improper placement of the system, unsuitable soil, etc. These types of costly errors must be avoided.

It was also observed that the long distance for supply of inputs and SAED supervision was a contributing factor. Poor topographic and soil studies were also discussed as a factor in construction of inefficient perimeters. SAED's BEP may not have enough adequately trained staff to carry out such studies and integrate them into local perimeter plans.

A question was posed concerning the differences in performance between the Matam and Bakel projects. While data for making firm comparisons was lacking the participants wondered if the same criticisms applied to the Matam project. The Bakel project manager explained that the two could not simply be compared in that the concepts were different to begin with. Research is currently being supported by the FAC to determine net income changes for farmers in the Matam project. Since the SAED representative was missing from the meeting it was not possible to determine what progress had been made.

Finally the participants agreed that a more collaborative project management approach should be used in the Bakel situation. Confusion over duties and responsibilities could thus be reduced.

Evaluation of the Sine Saloum Rural Health Care Project in Senegal.

A three-man team evaluated the Sine Saloum Rural Health Care Project from March 21, 1980 through April 18, 1980. The team consisted of Mr. Richard Weber, AID Director of Health Programs for South America; Dr. Graham Kerr and Mr. Charles Smith, Office of Policy and Planning Coordination/Health section, AID/Washington. This team was originally selected by AID/Washington to report directly to the AID administrator Mr. Douglas Bennet, on the impact of this project on the population of the project area (Department of Kaolack and Niouro du Rip). Since the GOS/USAID Joint Assessment and Evaluation was underway for the same project, the team agreed to also evaluate the project for this purpose. Following is a summary of their findings.

I. Introduction

The Sine Saloum Rural Health Care Project is in many ways more about management and administration than it is about health. It undertakes the immense task of establishing 600 village level health, auto-financed, care units in five departments of the Sine Saloum Region serving some 700,000 rural people. Although the basic medical interventions involved are simple the potential impact, if the project can be made to function, is immense.

Although the Project Agreement was signed on August 22, 1977 and was to run for four years, long delays in the early phases of implementation have meant that there are functioning Village Health Huts in only two of the five target departments. In the department of Kaolack huts have been operating for only three to four months. In Niouro most have been established for nine months.

II. Basic Elements

There are three vital elements. The village health huts must be financially viable; the Senegalese bureaucracy must be able to deliver effectively the needed support and supervision services; and an efficient medicine resupply system which is the life blood of the entire project must be organized.

The system was decapitalizing itself at the village level. We asked whether the Hut took in enough money to replace medicines used and cover other operating costs. Every post showed a significant shortage. At this rate, the Huts will soon simply cease operating because they will not be able to pay for medicine resupply. There are a number of possible explanations including: inaccurate records, medicines priced too low, excessive salaries taken by health workers, theft of receipts or medicines and medicines not charged for. The conclusion is that this self-financed primary health care scheme is not viable as it now operates.

3.1.2

A village management committee is supposed to be chosen to supervise the Hut, receive the money and generally mobilize village health related actions. We found little evidence of such committees being effective. The committee was an acknowledgement of its existence, but it did not do anything. We found little evidence of any effort from the Departmental Supervision Team to help keep the Management Committees viable or to check on the financial status of the Huts.

Senegalese bureaucracy is not now delivering adequate supervision and support in the departments where the project is in full operation.

Supervision trips. It was clear that visits had been few and far between. At the Health Post level, visits by the Regional Supervisory Team were clearly not a regular thing.

At the Regional level the supervision teams are more interested in and occupied with expanding the project into new departments than they are in assuring proper functioning where the system has been established. The departmental supervision teams foreseen in the Project Agreement have never been organized, thus throwing the burden on the regular Promotion Humaine Delegate and the Departmental Medical Chief in addition to their regular duties.

The life blood of this project is clearly a reliable pipeline of medicines. We cannot reach any firm conclusions on this point.

III. Project Evaluation

A. Selection of Village Health Workers (VHW)

Over one-third of the Huts have either lost or changed their Village Health Worker since the Huts began operating less than nine months ago. This suggests that the method of selection may be wrong. With hindsight it can be seen that there has been a basic contradiction in the criteria used. On one hand, a Health Worker needed strong ties to his village so he would remain in place. On the other hand, project designers decided it would be desirable to have health workers literate in French to facilitate training, bookkeeping and transmission of information. This meant that the health workers would have to have had some formal education which in turn meant that they would be younger and less attached. In practice the contradiction was resolved in favor of literacy rather than stability.

We found several Village Management Committees had asked the Chef du Post to select a worker for them. This latter group of VHWs tended to come from the town in which the Posts were situated, or a nearby urban center.

Many village committees failed to exercise their authority thus not establishing local control over this aspect of the health program. It is encouraging to note that several of the community leaders with whom we talked emphasized that the newly selected replacement first-aid workers were older, village men, often not literate in French, but someone who would be "their" health team leader.

B. Location of Huts

In Niore, there are too many Huts, too close to each other and too close to the Posts. They are competing for clients and are too much of a supervisory burden on the Post Chief. In Kaolack Department we appear to have the same problem. In one area, 5-20 kilometers southwest of Kaolack there are two Health Posts 15 kilometers apart. Between them are three Health Huts, thus on the average there is a health facility every three kilometers. Two of the Huts closed within three months of opening.

In Niore departments 54 (50%) of the Huts are within five kilometers of a Health Post or eight kilometers of the Niore Health Center. Half of these Huts (77) are currently closed - they are not needed by the local population who obtained better care and free medicines (when in stock) from the Posts. Of the 56 Huts furthest from the Health Posts only 11 (20%) are presently not operating. There is no Hut or village in the Department which is more than five kilometers away from a Post, and there are several Huts with 2 or 4 other Huts within 5 kilometers, a relatively easy walk or ride in horse and buggy for most villagers.

The Rural Community Councils chose the Hut locations. Most councillors secured one for their village and a few additional larger villages were selected regardless of proximity to other Huts and Health Posts. Few guidelines were given to the councils when they made their choices, and AID does not appear to have monitored the process closely. Five to ten Huts were planned for each Post. The final count ranges from eight to twelve with an average of exactly ten for each post.

Unfortunately, because of pressure to open Huts as soon as possible in other departments few lessons from Niore are being applied. The distribution of huts for Kaolack, Gossus and Foundiange departments, shown on the map in the Kaolack project office, is very similar to that of Niore - and we were told that not all the Huts have been marked on it yet!!!

C. Payment of the Village Health Workers

Most village health workers appear to receive about 20% of the income of their Hut as compensation. In some cases, when there are only two workers, they each receive 30% of the income. During a few of our visits we found that the first aid worker had taken 60% of the income, but had not yet distributed the other worker's shares.

The first aid workers and midwives both contribute to the income of the hut, but the sanitarian does not. In one village we found that the sanitarian had fined some people, including his own mother, for not cleaning up their compounds when instructed to do so. Several first aid workers were reluctant to pay the sanitarian, but they had paid the midwives even though they had not delivered any children since becoming a member of the health team.

The decision regarding the amount to pay the health team was supposed to be made by the Rural Community Council. In fact the decision was made by the Prefet, the Sub-Prefets and the Council at the Department level and everyone was informed about the division of the hut income by an administrative memorandum signed by the Prefet of Nioro. Thus the practice has been established that income is split as follows: 60% for the workers; 35% for medicines, and 5% for maintenance. The decision regarding the amount to charge each client was also made in the same way - in Nioro it is 50 CFAF for the first visit and 25 CFAF for subsequent visits for the same complaint. In Kaolack the Department Community decided to charge 200 CFAF per client, regardless of number of visits for each diagnosis. This was later changed to 65 CFAF per visit regardless of whether it was a first visit or a revisit. These decisions on charges and revenue distribution appear to have been made without great regard for the system's financial viability.

Paying the village health workers the major share of the Hut's income severely drains the system's capital. A second look at the financial analysis of eight units shows that even if the workers were not paid from the Hut's income, the Huts would still be losing money. Obviously a new financial structure has to be worked out as soon as possible. Communities have to know that if they do not change the charges and put more money into the system, soon it will be completely depleted of money and medicines - the key element of the health system.

The problem of payment for village health workers has its origin in a basic philosophical contradiction that was not faced squarely at the outset: are these people to be low level paid health functionaries or are they to be part time volunteers who receive some support from their village in the form of shared labor, millet, peanuts or something else (cotisation).

The issue was to a considerable extent decided in favor of money payment by the process of selecting health workers discussed above. It should be noted that in the Fatick project, by carefully controlling the selection process they have been able to hold on to the dues paying principle. It should also be noted that village birth assistants have traditionally been reimbursed in kind - one person told us that the traditional fee for a delivery was a leg of lamb.

There is clearly a dilemma here: The project cannot really support substantial payments to three village health workers from the sale of medicines, yet a clear result of the training and increased skill will be a desire for money payment. One approach to this dilemma might be to consider whether the Rural Communities could provide a small regular payment from the proceeds of the Community Head Tax. This would have the advantages of letting the health workers have some certainty about what money they are receiving, it would strengthen decentralization, it would tend to stop speculation about the MOH hiring the health workers, and above all it would help to rationalize the medicine sales operation.

D. The Transportation Dilemma - Horse and Buggies

The periodic supervision of village health workers by health post personnel was recognized in the project's design as essential to its success. In order to assure that supervision took place regularly, the project planned to place horses and buggies at the disposal of the Health Post. It was assumed that this "appropriate" mode of transport would be cheaper to buy and to maintain than comparably priced gas (as opposed to grass) driven vehicles. The buggy could as well be used to transport medicines to village Huts and to evacuate patients from villages to the Health Posts. The Rural Community was to be saddled with the responsibility for feeding and taking care of the horses, which assured the further interlocking of the Rural Community into the new health system.

At this point, the horse and buggies may be more aptly termed "in-appropriate technology". According to original estimates, horses would be purchased at about \$400.00 each and the buggies for \$120.00 each. Simple, single seat, buggies are quite plentiful throughout Senegal and are widely used in the project area. However, large, cumbersome, two seater carriages with sun roofs were designed and built for the project. The final cost was \$600.00 instead of the originally planned \$120.00. The horses were also purchased at a much higher rate than originally foreseen. Regardless of higher costs of the horses and buggies, if they are used effectively to facilitate the supervision of the Health Huts their cost may be justified. Their use by all Health Post Chiefs to visit Huts is certainly not assured. Health Post Chiefs at only three of the twelve

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health posts in the Department of Nioro du Rip reported they had used their horse and buggy to make supervisory visits. Those who did not use their horses indicated it took them too long to make their supervisory trips to the villages and there were no indications that the buggies were being used for patient evacuations. A few said they used their own cars or molyettes instead of the horse and buggy.

The low percentage of horse and buggy use at this early stage in the project suggests that Health Hut supervision by Health Post personnel will ultimately cease if the transportation issue is not resolved.

There is a dilemma here. Psychologically Health Post Chiefs - and others - who have advanced to automobiles are going to resist the loss of status and convenience involved in going back to the horse and buggy technology, and who can blame them. Yet we know from our own and other donor experience that the GOS cannot and will not provide financially or administratively for effective vehicle maintenance. (Indeed the courtyards of GOS offices in Sine Saloum are littered with the hulks of old donor provided vehicles.) We also know that the project will not be able to support autos or molyettes. At the same time it makes no sense to go on mechanically buying horses and buggies that will never be used. We do not have an answer for this problem but we urge the USAID to try to work out a flexible workable compromise.

E. The Disappearing Village Management Committees

Once the sites of the Huts were known, final control of the health unit was to be rested in village management committees. They would be assisted by Promotion Humaine (P.H.) and closely linked to the Rural Community Council. Under P.H. guidance the committee was to determine and discuss village health needs, select health workers from the village, control the finances of the Hut and decide how to compensate the health workers, build the Health Hut after receiving a grant for cement from AID, contribute to the building of the literacy hut at the Rural Community center, organize additional village support for the health workers, and assist with the maintenance of the horse for the supervisor from the Post.

We found that most committees were formed and listed at the Health Center in Nioro, but that they were not managing their health team. "The first aid worker and the Chef du Poste are the only people who really know what is happening," said one treasurer.

In several villages the only members of the Committee who could be positively identified were the chairman, usually the Village Chief, the Treasurer and occasionally the Rural

Community Councillor, when he was not the Treasurer. In no village did we find a team who felt they were managed by the Village Committee. Decisions regarding payment for the Village Health Worker had been made at the Department level; decisions on the drugs to be ordered were being made by the Village Health Worker and the Chef du Poste.

One of the reasons for the lack of management by the villagers is that there is no system of records with which they can monitor easily the income, expenses, and drug use by the team. A system which can be used by non-literates (there are several in existence - one as close as Fatick Department in the Senegal-Dutch project) is needed. Good records can be used by the Promotion Humaine staff in their work with the committees. Without records, increased technical assistance from P.H. will be of doubtful value. This lack of follow-up by Promotion Humaine is another reason why the Committees have failed to manage the Health Teams.

F. Medicines at Health Huts

The initial stock of medicines issued to the village Health Huts were limited to drugs that could be used by the village health workers to treat the basic health problems that debilitate villagers.

The following medicines and supplies were supplied to the Health Huts that were visited in the departments of Nioro du Rip and Kaolack: aspirin, chloroquine, piperazine, iron tablets, rehydration powder, aureomycin 3%, scabies ointment, compresses, and gauze.

The drugs issued are quite appropriate for the treatment of most basic village health problems. There were, however, complaints at almost all the villages that should be addressed by the project. When asked if any other drugs were needed, village health workers invariably mentioned their need for alcohol and mercurochrome as disinfectants for cuts and wounds, and in delivering babies. Many huts had purchased alcohol, mercurochrome and methyl blue for treatment of mouth sores, at private pharmacies. Even though aureomycin 3% is recognized as a better disinfectant than mercurochrome the Senegalese villagers are familiar with these three medicines and their absence in USAID's initial stock may have reduced the Health Hut's utility in the eyes of villagers. Once villagers have been introduced to treatments at the Hut with familiar disinfectants, aureomycin could have been introduced as a more effective disinfectant. Village birth attendants were particularly concerned with the absence of alcohol and mercurochrome and encouraged women to continue to travel to the Health Post Maternities to have their children.

The absence of medicine at the Health Hut to treat diarrhea was another concern expressed by Health Post nurses in Niore and Kaolack. It was found by looking at Health Hut case books that piperazine (worm medicine) was frequently being used for diarrhea. Health Post personnel have in many cases distributed sulfa drugs to village health workers to treat diarrhea and it is clear that health workers will continue to try to obtain it.

USAID's initial supply of medicines included ten liters of Scabies ointment (a quite expensive medicine) for each Health Hut. Scabies was at an epidemic level during this project's planning stage, but has since subsided. It might be wise to collect the Scabies ointment and store it carefully at a central point until it has to be used to combat another epidemic.

The amount of the cheapest and most widely used drug, aspirin, should be increased in the initial supply, while the Scabies Ointment should be eliminated at the Health Hut.

The initial supply of USAID medicines was also to have included aureomycin 1% to be used in treating eye infections which are very common. The 1% aureomycin was not issued because by the time the USAID procurement process had done its worst and the Senegalese Customs had added their bit, the medicine was within one month of the expiry date listed on the tubes. Subsequent shipments have been received in the Kaolack Regional Pharmacy which have not expired, but rather than issue these for Niore and Kaolack Departments when they could be immediately used, they have been earmarked for future use in Gossas and Foundiougne - one hopes before a new expiry date has passed.

The whole question of U.S. procurement of project medicines needs to be looked at. First of all, it should be determined how the 1% aureomycin that was essentially useless on arrival was purchased. More importantly, is USAID really acting responsibly to procure medicines for this kind of a project from the U.S. with labels in English and strange names and dosages? As soon as village health workers get accustomed to them - if they do - they will have to switch to a permanent local supply line. USAID managed to supply locally purchased automobiles, why couldn't USAID do it with medicines?

G. The Inadequate Record Keeping System Which is Ignored

Throughout the system we observed serious inadequacies in the records of project activities and use of resources, -- from the lack of bi-annual progress reports of the entire project for USAID to the absence of a standard form on which the village management committee could order new medicines from the Health Post. Poor records make it very difficult to monitor the system, to supervise the work in different parts of the system, or to know if changes in work assignments have any effect upon the effectiveness of the project.

The village first-aid workers spend considerable time keeping their records and they do it quite well. Records of clients, their diagnoses and treatment, their sex and age, are kept on a daily basis in high school work books which have been cut and ruled by the village worker during the training program. Their financial records are less complete and the village treasurer rarely keeps an independent record of money handed to him or spent by the Hut. Only occasionally did the first aid worker record his expenditures in his daily financial book. A request for drug orders usually resulted in a frantic search for odd scraps of paper which were sometimes found, usually not. Several Post Chiefs also had collections of odd pieces of paper from his Hut, on which there were lists of medicines and an amount of money that had been given to the Chief. In several Huts we were not able to find a copy of these lists.

The records kept by the first aid worker are not summarized on a periodic basis and there was no evidence that they were analyzed during the Post Chief's supervisory visits. The Chief seems merely to check if they are neatly kept. (The only analysis, to date, is presently being done by the Peace Corps Volunteers on their own initiative).

At the present time the first aid worker's records can only be kept by someone who is literate in French. The midwives' and the sanitarians' records, which are kept on standardized printed forms, can be kept and understood easily by someone who is not literate. The Village Management Committee (and the Post Chief) should have a monthly report, on a standard printed form, which can be interpreted by people who are not literate in French. They should know their financial and medicine stock positions as well as the activities of each of their workers. This regular summary, produced at the village level, will be the basis of most other regular reports throughout the system.

We found several village workers who were discouraged about their records -- as one said after we had finished our analysis, "Thank you for looking at my books, now I know it is useful to keep them neatly."

H. Role of the Health Post Chief

One possibly unforeseen impact of the project is a significant increase in the responsibility and work load of the Health Post Chief. As the system is structured he is the focal point for all that goes on in 8-10 constituent sub-posts. They look to him for professional guidance and support, for administrative back stopping, for medicine supply, and generally to help them out with anything that they cannot handle. In addition he must continue to operate his dispensary and supervise the Rural Maternity. He also ends up handling considerable amounts of

money, at least as things are now structured, (and in the view of many is thus placed in a position of excessive temptation).

The project designers devised two measures to deal with these problems:

1) To help with the added workload at the Post level a well trained Sanitary Agent is to be assigned who, among other responsibilities, will be charged with supervision of the constituent Health Huts. Since the new Sanitary Agents have not yet graduated from training school, we cannot make a conclusive judgement, but the Health Post Chiefs with whom we discussed the question were skeptical. Since this is a supervisory function and they are the senior people they appear to expect to do the supervision. In one post where a Sanitary Agent is already assigned, the Chief made it clear that he intended to continue to supervise the Huts.

2) The project design tries to separate the Chief of Post from the money stream by providing that payments for medicines will flow upward from the village administrative committee to the Rural Community Council to someone at the Department level and eventually through the Regional Pharmacy to PHARMAPRO in Dakar. In effect it is hoped to establish a rural version of the Pekine Project where the financing and accounting are successfully separated from the provision of medical services. It is doubtful if this is feasible for several reasons:

- There are too many layers (which means more sticky fingers and more weak record keeping),
- The administrative committees are very weak and likely to remain so, given the supervisory resources Promotion Humaine is able to devote to them.
- Transportation will always be a critical bottleneck. Passing money up the chain and medicine down will necessarily devolve on the person who has transport and that is most likely to be the Health Post Chief.

An alternative strategy which might be considered would be to strengthen the Chief's role, cut out some of the layers and devise a simple means of holding him accountable. At any rate, it seems clear that the Health Hut system will have a heavy, if as yet undefined, impact on the role of the chief.

USAID Management Style

While we are not privy to the negotiations which took place prior to the signature of the Project Agreement and the compromises that were made at that time, some comments are in order on how USAID has discharged its stewardship over the funds in this project. The first point is that USAID agreed to enter into a massive 600 village project with no pilot project experience to guide it. This was a highly questionable decision.

3.1.11

USAID never provided, and does not now have, a strong, cohesive technical assistance team to help administer the project. There are those who argue that this "hands off" style of management is preferable since it assures that the local bureaucracy will regard the project as their own and take responsibility for it and that the villagers will regard it as their own project. (In fact they all refer to it as the USAID project). This may be true, but if the project collapses as it threatens to do, what has the "hands off" style accomplished? The basic rule should be that the project has to work, no matter what the management style, otherwise everyone loses. In this case there is a comparison that can be made. The Dutch primary health care project in Fatick Department of Sine Saloum has almost identical objectives, but is being managed in a very firm "hands on" style with close technical support to all aspects being provided by the Dutch project manager resident in Fatick. It may be that time will show the "hands off" style to be superior, although at this stage the Fatick project is conceded to be working much better.

Is it really necessary to choose between a smothering infusion of technical advisors, which appears to have been one of the problems of the Gossas project, and our approach of no real supervision at all? We do not know why USAID adopted the style it did and we won't speculate. Suffice it to say that whatever the reasons they were not sufficient and if we do not change soon the project will go the way of other useless similar efforts, raising hopes but producing only disappointment.

3.3.1

Summary of Findings from the Basic Health Project Beneficiary Survey in Kaolack and Nioro Departments. May 27, 1980

I. Beneficiary Profile

The Basic Health Care Project involves the whole population in Kaolack and Nioro Departments. However, as Health Huts are only established in villages selected for their polarizing effect on neighboring villages, it might be thought that people in villages with huts benefit more from this new service. The survey confirms this hypothesis.

Health Huts were expected to deliver basic care to all segments of the population and in addition, provide assistance, a place for delivery and pre- and post-natal care to women. But the survey shows that there was low attendance by women (especially with respect to deliveries) though they are often responsible for taking their children to the Health Hut.

The survey also sought to analyze possible differences in behavior between those people involved in project activities and beneficiaries, and, between different age groups of beneficiaries. The evaluation showed a high attendance of the hut by a sizable group of project workers; and an often low use of hut services by young people.

The surveyed population is as follows:

o Total:	460 people in Kaolack and Nioro	
o People living in villages with huts		236
o People living in polarized villages		224 (total:460)
o Men		281
o Women		179 (total:460)
o Project workers		88
o Other people		372 (total:460)
o Young people		117
o Adults		249
o Aged		94 (total:460)

II. Use of Goods and Services

1. Knowledge of Village Health Workers, Management Committee Members and their Role

a. Over half of surveyed people know who the Village Health Workers are, especially the first-aid worker whose task is of most immediate need. Among people surveyed in villages with huts, and mostly among men, workers involved with the project know VHWs better than other groups do.

b. Although management committee members are less known than VHWs especially in Nioro where less than 1/3 of surveyed people acknowledged knowing them (less than 50% of surveyed people in Kaolack do), the committee chairman and treasurer are the best known of all three members; the deputy treasurer is not well known.

Groups who are well informed on the management committee members are the same ones who know who VHWs are. In polarized villages, women and those not involved with project activities hardly know who the management committee members are. (Over 70% of women surveyed in Kaolack and 70% of people surveyed in polarized villages.) All groups in the Kaolack area know VHWs and committee members better than in Nioro department; this is probably because discussions held before project implementation are more recent and hut attendance is higher.

c. The role of people involved with project activities is better known in Kaolack than in Nioro. The first-aid worker's role is best known: 50% of the Nioro sample and 61% of the total sample surveyed.

People are not very well informed about what the management committee members' role is: In Kaolack 39% at most (16% in Nioro) know what the Chairman's role is. The most informed people come from villages with Health Huts, men especially, are involved in project activities; in polarized villages, the least informed regarding the management committee members' roles are women and young people, and in Nioro, adults and older people as well. The high percentage of people who do not know anyone involved with project activities (and are not informed about their role) results from a lack of information, or even a lack of interest which affects attendance and use of Health Hut services.

2. Health Hut attendance and use of goods and services

a. In both departments, most people surveyed (65%) said they had not gone to the hut for the last three months. This attendance rate is noticeably higher in Nioro where the Health Project has already been functioning for a longer period.

Whereas in villages with Health Huts few people involved with the project said they had not been to the hut, in polarized villages, the largest number of people who said they had made use of the Hut included women, young people, and those involved with project activities (Kaolack) as well as aged people (Nioro).

At the most, 34% of the survey sample said they had been given care at the hut over the last three months. Attendance in Nioro is fairly homogeneous in terms of groups, though differences between villages (with Huts and polarized villages), men/women, young people/aged people, are still apparent. Attendance is less homogeneous in Kaolack: in polarized villages,

less idle women and young men have been more often to the hut than other groups. In both departments, the family members of respondents go more to the Health Hut: 54% in Kaolack and 43% in Niore. One reason for this higher attendance is due to child care. Variations in categories are similar.

In comparison to other care delivery sources, the Health Hut ranks first for 61% of people surveyed in Kaolack, whereas in Niore (21%), it ranks third after the Health Post and Dispensary. This difference is due to a very high rate of consultations considered as hard to support in Niore, whereas in Kaolack such consultations are considered as necessary; besides, as the project is more recent in Kaolack, prior information has made larger acceptance of this formula possible.

This difference is more marked with respect to drug supply: in Kaolack, Health Hut ranks first for 72% of surveyed people whereas it ranks third after the dispensary in Niore (certainly after smuggled drugs from the Gambia with their well organized and very spread out networks).

In both Departments, malaria is the most cited illness, for which people have sought care at the Health Hut, followed by stomach problems, diarrhea and infections. There have been very few pre- and post-natal consultations, or child surveillance. This is the reason why nivaquine and aspirin are the first cited drugs. However, 19% of people surveyed in Niore expect to get other medicines from the hut than those usually distributed there. Few surveyed people report a shortage of drugs at the hut: 13% said that the huts were mostly running out of nivaquine, aspirin and Auromycine 1% (eye ointment).

In both Departments, deliveries (for about 3/4 of surveyed people) are performed at home with the help of a traditional midwife related to the family. Very few births take place at the Health Hut: this is mentioned by 5% of surveyed people. In case any problems arise, they go to the dispensary or to the Health Post.

The sanitarian has negligible impact on people: 76% of people surveyed in Niore and 51% in Kaolack said they did not get advice from him or did not respond at all. One quarter of people surveyed in Niore cited an action they performed upon the sanitarian's advice: none cited two or three actions, whereas in Kaolack 35% cited three and 13% cited one or two. People in polarized villages, women, people not involved with the project and young people, cited less actions performed upon sanitarian's advice.

In both Kaolack and Niore, the radio program has negligible impact: 70% of surveyed people said they could not recall the last program and 66% could not recall its topic. The largest

affirmative group consists of young people in Niore and men in Kaolack.

III. Project Support Beneficiary Involvement in Project Design

In both departments, the project tasks were not subjects of discussion between the people and project officials: 1/3 of people surveyed in Kaolack had discussed these tasks; questions related to the organization and management of Huts were not discussed prior to project implementation, especially in Niore (only 18% affirmative responses) and fewer people from polarized villages and women referred to such discussions.

Most people did not know how VHWs were selected: 13% in Niore and 3% in Kaolack mentioned this was discussed prior to implementation.

This situation is due to the fact that only part of the population was informed about the project, and that in Niore, information diffusion was carried out by village council members, (30% and 31%) whereas in Kaolack it was conducted by Animation and Health (33% and 25%). The regional radio station played no role in informing people prior to project implementation.

These findings show that Health Huts were established by outsiders, this includes people vested with project responsibilities, village chiefs, or individuals from villages with established Health Huts. Other groups have not been well informed about the Health project and thus were not much involved in its design. This is the reason for corresponding variations in Hut attendance and in use of goods and services by groups that were less involved in project design, and especially in the selection of VHWs or the Hut's organization and management.

Beneficiary Involvement in Carrying out the Project

Despite limited information and discussions prior to project implementation, especially in Niore, respondents knew that villages contributed to selection of VHWs. Thus, it was their view that even though they were not well informed and did not discuss this project extensively, their villages (therefore other people) contributed to project establishment (that is, they carried out tasks) upon the project officials' requests. In Niore, a small group (less than 1/3) mentioned village participation in organizing management committees.

Except for people from villages with Huts, men, and those people who are involved with project activities, most people did not know whether the rural council member took part in project establishment, or stated that he was not involved (especially people in polarized villages and, even more so, women, in Kaolack).

3.3.5

Most people surveyed in both departments thought that, unlike others, village chiefs were largely involved (except in polarized villages in Niore, where only 20% thought he took a big part).

If project establishment was undertaken by more or less well informed villagers, this was not the case with Hut management, especially the disbursement of money to the first-aid worker: 72% of people surveyed in both Departments said they did not know how this money was divided; this is true of less informed groups especially 96% of women in the Kaolack sample. This lack of knowledge may be partly due to recriminations for drug prices.

Half of the people surveyed in Niore stated that the hut was never repaired or maintained. The remaining group said they did not know, and a reduced fraction stated that it has been maintained in the last three months of the year.

The VHW's payment system with receipts from drug sales is appropriate for 61% of people surveyed in Kaolack. Among these, 19% preferred group work and 8% contributions in kind in order to lower drug prices. In Niore, most people did not respond. Those who sided with one idea or another, preferred group work (23%).

This situation is probably due to a lack of knowledge of the management system in operation and made more critical by black market medicines as by the difficulty encountered for several years in a row, to retain part of the family budget for health purposes despite the obvious advantages of this formula "proximity and rapid care".

In Kaolack, the failure of collective fields and the difficulties encountered during preceding rainy seasons (hivernage) has led the people interviewed to express a preference for the present set-up.

IV Institutionalization

1. Few of the people surveyed were able to cite traditional organizations that took part in the activities of the Hut. This is perhaps a shortcoming of the project, which could explain some of its difficulties particularly since in Gossas, villages have been able, thanks to their traditional organizations, to pay the salaries of VHWs on a regular basis.

2. As for the ability of villages to take on this cost, once all external help ceases, respondents in Kaolack showed more optimism (40%) than those in Niore (13%). However, 43% in Kaolack and 57% in Niore gave a negative response to this possibility. This attitude can be interpreted to mean that a lack of know-how and a lack of information can explain the relatively low participation of the beneficiaries in the management of the system.

(Note that in Nioro, 76% of those holding any position have answered negatively).

V. Improvements

In comparison to the situation before construction of the Health Hut.

- 1) A little more than 1/4 of those questioned said that there has been no change.
- 2) 58% in Kaolack and 40% in Nioro answered that there has been an improvement.
- 3) 14% in Kaolack and 31% in Nioro did not give any opinion or just failed to answer.

These results are encouraging since a majority replied that there has been an improvement but also somewhat troublesome if one considers the pessimism of those questioned about the capability of villages to completely assume the functioning of the project at a later date. What will remain if at this stage of the project, the great majority has not yet been motivated enough to insure the success of the Health Huts.

VI. Development, Integration

1) While in Nioro the great majority of those questioned mentioned only one medicine they would like to see distributed at the Hut, in Kaolack the majority mentions two or three medicines (antitetanic and antivenemous serums, alcohol, rheumatic balm, "huile gomenilee", srivaquine syrup).

This difference can be explained at the same time by a more marked interest in Kaolack for the Hut built only recently which reduces travel time, and also by the "black market" in medicines that exists in Nioro.

2) Whereas in Kaolack the majority questioned have no proposal to offer (48%), it is proposed in Nioro to change the architecture of the Hut (39%); the majority proposes changes in the structure and modalities of the system; operation and maintenance of the Hut (33%); choice of VHW (25%) and their salaries (15%).

Therefore, it is with experience, and by taking into account a smaller information base, that those questioned in Nioro are proposing to reformulate the system to insure that VHWs receive their salaries on a regular basis (which will not be borne by the beneficiaries), a lowering of medicine prices, the choice of older and more experienced midwives, and the training of beneficiaries in the project.

Proposals at Kaolack deal with changes in the Hut; it should have more rooms, should be built with cement, the women's room should be in a discrete spot; some mentioned the need for more training of the beneficiaries and a smaller range of medical supplies.

If in Kaolack there was no proposal for VHW salaries, the price of medicines was nevertheless judged too high.

VII. Future Recommendations

1. Beneficiary Proposals

a. It is in Nioro that proposed changes are most important. Those questioned proposed to modify the system of VHW salary payment by diversifying the care given, by associating the operations of the Health Hut to a production program in order to lower medicine costs and increase usage.

b. Those questioned in Kaolack want the same changes without proposing the means of achieving them, the present system is best for the time being.

c. Those questioned in Kaolack insist mainly on architectural changes and on the Hut plan: more rooms, cement construction, separate location for women's consultation room. As in Nioro they propose to increase the range of medical care given. The VHWs wish also to have adequate facilities to house and feed their patients.

d. In both cases, mainly in Nioro, those questioned wish better information for all groups, in order to bring about beneficiary participation, and an actual take-over of the project.

2. ENEA Proposal

Undertake (or pursue) a wide information campaign of populations, mainly of those groups that seem likely to be last reached.

For that purpose make available to the organizations involved audio-visual means in good working conditions, and adapted to different publics, and set up permanent information systems for villages.

Initiate or continue the training of beneficiaries, through surveys and collective discussions during which the ways and means of an actual take-over of the project by the villagers would be sought. This is a determining factor for a sustained development process, which has been neglected so far in the field.

3.3.8

Seek to create a management and control system among villages, in order for certain villages and groups not to think that the Hut only concerns the village in which it has been built or certain groups only.

Attempt to tie the health program to productive actions, a part of the surplus would allow to pay the salary of the VHWs. Health is a service that villagers cannot totally finance with their resources.

Diversify actual health care and consider the upgrading of the skills of VHWs to widen the range of proposed care. Enhance the value of traditional medicine by setting up a garden next to the Hut.

Increase the means at the disposal of the hygienist (information/diffusion) in order to differentiate him from the seourist. Let his program become the business of the village committee. The contribution of the hygienist would be in the implementation phase.

Tighten the control of VHWs to avoid excesses made by some of them (rendering care for which they have not been trained).

Consider giving the midwives a complete gear-kit that they can take home; the building in a separate and discrete spot for a well equipped room for women. Consider also the training of midwives with more experience (therefore older).

Compte-Rendu:

Review of Sine Saloum Rural Health Care Project Evaluation

Date: Friday, 9 May 1980.

Attending: Messrs. Sow, Samb, Garcia, NDiaye, Rea, Salem, Magnusson, Vincent.

The meeting was called to review the findings of an evaluation team from USAID/Washington. The evaluation team evaluated the Sine Saloum Rural Health Care Project from March 21 through April 18, 1980.

Director Sow asked first that a short summary be made of the findings. Following that he requested that participants make detailed comments on the report's findings.

Mr. Salem summarized the report's findings.

He cited the following points:

1. Recruitment process for the village health workers was judged to be unsatisfactory. Literacy criterion was chosen over other factors, creating instability in the system.
2. The selection of sites was not well thought out. Some huts overlapped in coverage with other huts and health posts. Criteria are needed.
3. Payment of health hut personnel from receipts of medicine sales was felt to be inappropriate. This method of payment results in the huts not having enough cash to purchase new supplies. New approaches are needed.
4. Transport remains a problem. Appropriate modes must be decided on.
5. The local management committees are not functioning as intended. Important local decisions are being made at the Department-level. Local management capacities are weak.
6. The stocking and resupply of medicines is problematic. Some medicines are prescribed inappropriately. Some medicines are not available and the system for reordering is not working well.
7. Reporting and record-keeping is not adequate at the village level.
8. The Chef de Poste de Santé is charged with too many tasks, largely because other levels of the system are not well equipped to administer the program.

3.4.2

9. The role of USAID is reduced to one of financial administrator. Technical and managerial assistance is hence reduced, perhaps to an unacceptable level.

The specific commentaries were as follows:

Dr. Vincent of USAID provided some information on the number of health huts in operation. 600 huts were planned for. 200 were established and at the present time 120-130 are functioning in five departments. Dr. Vincent felt that the present management system gave too little scope to the local management committees and that lines of authority between the Prefet, the Post system and the villages were not clear.

Mr. Samb noted that in regional programs of this type supervision is difficult. Training for local level workers will help reduce supervisory problems. Promotion Humaine has given training in local management committee formation and operations but felt that more follow-up was necessary.

Dr. Vincent felt that it was possible for the huts to be financially self-supporting. The question of costs of medicines and salary payments should be settled by the villages themselves and not by decree from the Prefet. Failure to take action in the area of financial management will cause the failure of other huts.

Promotion Humaine will be providing more management training assistance to assist villagers in making these decisions.

Dr. Vincent remarked that appropriate means of transport must be found for each zone in the project area. Mr. Samb felt that this question was important if the role of the Agent Itinerant is to be made clear.

The group discussed the problem of procurement of supplies. Dr. Vincent felt that USAID's policies were too rigid. Mr. Garcia suggested that customs problems could be solved by the Comite de Relance d'Investissements.

Mr. Samb and Dr. Vincent agreed that the administrative and communication systems needed to be improved to create reciprocal confidence between the villages and the other levels of the health system. Financial control functions now administered by the Posts and Departmental officials should be separated from more technical medical functions.

Finally, Mr. Sow felt that the project approach of encouraging local management was superior to having AID take a more direct management role.

SENEGAL CEREALS PRODUCTION Prepared May 22, 1974

Date of request: December 16, 1974
 Funding request: 3,815,000 dollars
 Cooperating GOS Agency: Société de Développement et de Vulgarisation Agricole; CNRA; National Agricultural Research Center.
 Cooperating donors: IRAT, FED, SATEC, IDA
 Life of project: 1977 -- March 31, 1978

Description:

A. GOAL: To contribute to economic development of agricultural productivity particularly in Cereals in the groundnut basin area of the five Departments of the Thiès - Diourbel Region

1. OVIs : Increase yields per hectare on participating farms through introduction of farm intensification methods of from 25-50% over the life of the project. Increase number of farmers participating in various stages from semi-intensified farming to full scale use of techniques in accordance with specific objectives set by SODEVA.

B. PURPOSE: To assist the GOS to achieve a higher and self-sustaining level of productivity in the agricultural sector. Support the efforts of SODEVA to diversify and intensify productivity in the west-central region of the groundnut basin.

1. OVIs: EOPs Increased groundnut and cereals output per farm participating, and benefiting from SODEVA's extension system.
2. Increased government revenues due to increase in groundnut output from application of improved cultivation techniques in zone of intensification.
3. Stabilization of cereals market price as a result of increased cereals output.
4. Reduced demand for rice in rural environment as a substitute for cereals.
5. Increase in farmers incomes producing greater self-sufficiency and stability in rural environment.

C. OUTPUTS:

1. Recruitment and upgrading of extension personnel by SODEVA.
2. Establishment of required SODEVA infrastructure including training and farm demonstration of farm facilities in project area.
3. Setting up applied research unit to assure coordination between research and agricultural extension activities.
4. Increased number of farmers to be included each year in intensification program.
5. OVI's: MAGNITUDE. Number of personnel to be trained and upgraded in accordance with personnel schedule in annex.
6. OVI's Number and types of building infrastructure in accordance with appropriate annex outline, including area planted to millet and groundnuts.

AN ASSESSMENT OF CEREALS PROD. I (SODEVA)I. Background of SODEVA Cereals Program

The SODEVA program of crop diversification and intensification was the result of the early 70's drought and recurrent food deficits, particularly in staple cereals:

The program was part of Senegal's evolving agricultural strategy and focused on millet and groundnut production. The program had three objectives. First it was to achieve increased production of peanuts through introduction of improved technical "packages" of seed, fertilizer, etc.. Secondly it was to introduce similar packages for millet intensification. Increased production was intended to move Senegal to cereals self-sufficiency and hence savings in import costs. Finally cereal reserves would be stocked for emergency use during future droughts. Food security was to be enhanced

In 1975 the SODEVA program was one part of a larger program which has led to increased investment in the agricultural sector. The overall strategy was manifested primarily in graduated increases in farm-gate prices for staple foods in the government's marketing program. This was accompanied by increased capital investment in newly decentralized regional development agencies and in production credit. Most recently the government removed indirect food subsidies for the urban population by letting staple foods rise to their true cost, reflecting increased production costs. All of these national adjustments were to encourage increased production in the agricultural sector.

At the farm level, additional measures were taken to increase production. The measures were primarily extension services to the case of SODEVA.

II. The SODEVA Program and USAID's contribution

The SODEVA program extends beyond peanut and millet production to general diversification into other crops and livestock. The USAID component of SODEVA's program however concentrates primarily on increasing millet production because of its economic importance and its role in food security.

With the USAID contribution several specific outputs were planned to accomplish the wider purposes of establishing a crop diversification and intensification program. USAID funded:

1. The training and payment of increased numbers of village level extension agents.

4.1.2.

2. In-service training for extension teachers and existing vulgarizators.

3. Upgrading of training and extension facilities and materials.

4. The establishment of a farm training demonstration system using USAID funded equipment.

5. Establishment of an Economic Research and Evaluation Unit which would circulate agricultural production results back to the agricultural research station as part of the process of refining the productivity of the packages.

The resulting extension program was to saturate the Thies and Diourbel regions with several types of crop diversification packages. The extension agents were to be responsible for encouraging local testing of the ISRA developed packages which included equipment, animal traction machinery, improved selected seeds, fertilizer and specific cultural practices. A number of packages were made available, some requiring little capital risk and others requiring substantial investments in animals, equipment and fertilizer. The packages would be evaluated for their contribution to productivity and increases in net farm income and the results used by the research program at CNRA in Bambey to make further adjustments. Other system support was to have been provided in improving grain storage facilities and in establishing a veterinary care program. ONCAD was to have been responsible for purchases of equipment and inputs and for the accompanying credit program. ONCAD was also responsible for marketing of production.

Of paramount importance to the success of the project was the assumption that there would be a degree of price stability guaranteed by the GOS's market interventions through ONCAD. The price stability assumption was important to encourage the farmers to adopt the more costly technical packages and to generally encourage production and commercialisation.

III. Issues For Additional Evaluations

Three major evaluations of the SODEVA program have been carried out since 1977. Additionally a USAID Project Paper for SODEVA Cereals II was prepared and approved in 1979. A number of important issues have been raised and not completely answered in these four papers. Moreover a number of economic and institutional changes since 1979 make it necessary to review the SODEVA program in its entirety. The following issues need to be more completely examined in this review.

4.1.3.

1. A review of the productivity of the SODEVA packages and their contribution to cereals self-sufficiency and net income increases.

Previous evaluations have called the economic feasibility of SODEVA's packages into question. On the basis of the evaluation report by Steve Franzell in 1979 a low benefit cost ratio and a negative internal rate of return were calculated. These results were challenged by the AID/Dakar agricultural economist on the basis of the assumptions and data used in the analysis.

In short, existing data must be assembled and analyses done to again assess the "bankability" of the project. Particular account must be given to probable shifts in the cost of comparative imported grains, particularly rice, in overall computations.

2. Insofar as current cost benefit analyses can only be viewed as probabilistic estimates of success, an analysis must be made of SODEVA's contribution toward cereals self-sufficiency. Specifically some indication of the increase in productivity resulting from the packages should be given. To date productivity increases have been registered in small research farms but not on a regional or departmental level. Comparison of experimental and observed results should be done with the objective of accounting for shortfalls in on-farm production. An analysis of the emergency stocking system should be carried out.

3. Viewing millet production as a system of tasks from research to marketing, a review should be made of capacities to carry out all the tasks implied in the system. This analysis should involve the identification of financial, technical and institutional factors which bear on the achievement of cereals self-sufficiency within the SODEVA program.

This issue properly belongs outside the scope of an evaluation of SODEVA extension. Nevertheless, the ultimate measure of success of SODEVA is not only in achieving production increases. The measure is that of increasing the consistent availability of millet at an affordable price to the consumer. Even with improved productivity, high cost and inefficient marketing services will cause a reduction of consumption and ultimately affect production.

a. Specifically the inputs procurement process should be examined and the performance of SODEVA and ONCAD examined. Timeliness of delivery should be assessed. In connection with input and equipment procurement the production-equipment credit program must be examined to 1) assess the adequacy of the credit supplied and, 2) the ability of farmers to repay loans now that ONCAD is no longer purchasing millet.

b. The entire marketing process should be examined from on-farm processing, purchases, transport, and distribution. The cost structure of marketing should be assessed to provide a more reliable estimate of the competitive position of millet in urban areas. Particular bottlenecks in the marketing process should be identified as well as unexploited opportunities for marketing millet in other forms.

At this time the production system, including the farmer, SODEVA and marketing institutions, are not increasing the availability of millet at an affordable price. Millet is available but at a price at or near that of imported rice, the preferred staple cereal. On the basis of the commercialization problems with millet one must question the economic viability of the whole millet production system as well as the goal of cereals self-sufficiency. This issue will be dealt with more specifically in the macro-economic portion of the assessment.

Concerning SODEVA's extension service one must note that over time the concept of SODEVA's institutional mandate has enlarged considerably. SODEVA's original tasks were primarily in extension. Other Senegalese institutions were responsible for organizing farmers, cooperative development, credit, supplying inputs and marketing. Basically these components of the groundnut - millet production system failed to give the necessary support to the overall SODEVA program.

What appears to be happening is that SODEVA is absorbing these other tasks. The organizational domain of SODEVA is being expanded into new administrative functions (cooperatives, credit supervision) and also into new subsectors (diversification into crops other than millet, livestock, etc.). In sum, SODEVA is becoming a regional agricultural development agency and not a crop specific extension agency. One could argue that this change is precipitous, coming at a time when SODEVA is not managerially or technically capable of handling these tasks.

At this point the final division of tasks between SODEVA and other governmental or parastatal organizations is in flux. It is, however, possible to identify four tasks that will be superimposed over SODEVA's existing institutional infrastructure. In all probability SODEVA is not capable of absorbing these additional tasks. One must remember that SODEVA for years was developed as an extension organization. Those functions are considerably different from the variety of activities now proposed for SODEVA.

These four increasingly important tasks are:

4.1.5.

a) SODEVA will have to play a larger part in the setting up of cooperatives with appropriate management skills. This is necessary because the cooperatives themselves have been given a larger role in marketing and in the collective purchase of inputs and equipment.

b) SODEVA must become increasingly involved in storage operations which have formerly been the role of ONCAD.

c) SODEVA will have the responsibility of restructuring the sizes of the cooperatives to permit economies of scale in group purchases of inputs and machinery. Credit viability will enter into this process of regrouping and training.

d) SODEVA must increasingly become involved with the marketing of cereals production, heretofore the domain of ONCAD. Since marketing will be put primarily into the private sector, SODEVA will again have to assume regulatory functions, provide technical assistance in storage and transport and equip local cooperatives with marketing capacities.

The question posed is whether SODEVA can hope to perform well in this broader, more complex task environment. Its involvement in some of these functions is precipitous and perhaps damaging to its other more firmly established functions.

4. An attempt should be made to reinforce local cooperatives management capacities through the SODEVA extension services To this end a review of existing local capacities should be made. Farm and cooperative record keeping procedures should be examined. Credit management of the cooperative level should be reviewed. Plans to revise the credit process should also be assessed.

5. A review of the existing data gathering and evaluation programs, should be carried out. SODEVA has submitted an evaluation plan as part of the SODEVA II Project. This should be reviewed in the light of 1) previous data gathering bottlenecks, 2) the methodology required to seriously assess impact and 3) the need for farm level data to be used by farmers in making farm management decisions.

6. At the macro-policy level, policy alternatives should be outlined presenting a balanced investment strategy between rainfed cereals production and irrigated rice production. Future demand at different levels of population should serve as the starting point for this analysis.

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D. INPUTS

1. Financial assistance for increased number of Senegalese extension personnel required for program.
2. Provide 2 expatriate technicians, training specialist and an agronomist.
3. Construction and equipment
 - a) Training and demonstration facilities.
 - b) Warehouse farm stores and office space.
 - c) Training infrastructure and extension equipment.
4. Support for operation expenses
5. Funding for Applied Research Unit, including possible experimental unit.
6. Continued GOS support of SODEVA at 1973 level in project area.
7. Continued programs of other donors which directly or indirectly affect SODEVA.

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4.3.1

Summary of Findings of the Beneficiary Survey for SODEVA

1. The survey of beneficiaries for this project was conducted by ENEA among 135 farmers in the Thies region and 146 farmers of the Djourbel region. These sub-samples differ according to a number of characteristics: First, age - 50% of Thies farmers are over 56 years of age compared to only 17% of the Djourbel group; they also differ according to sectarian affiliation - 70% of the Thies farmers identify themselves as Tidjani while nearly 60% of Djourbel farmers consider themselves Mourides. The two samples also differ in the incidence of technical packages being applied and supported by SODEVA interventions. Djourbel farmers are equally divided into the three main packages (TL - 34%; TB - 37%; TBFF - 29%), while in Thies 54% of the farmers are TL, an additional 23% are TB and 19% are TBFF.

2. The use by beneficiaries of the goods and services provided by the project can be verified by the incidence of extension activities in the villages sampled, the source of purchase of agricultural equipment and other needed inputs. SODEVA agents are often in the villages of both Thies and Djourbel (81% and 91% of the farmers indicate awareness of their frequent presence). They compare favorably to the 10% and 15% who are aware of Promotion Humaine's work or the 32% and 25% who are cognizant of the Centre d'Expansion Rurale Personnel. There are few differences between farmers in the two regions regarding the use of agricultural inputs (fertilizer, fungicides, and pesticides) provided by cooperatives. However, farmers from Djourbel are more likely to purchase these from private sources: 70% of them purchase fertilizer in the open market compared to only 9% of the Thies sample. A similar pattern can be found in the purchase of agricultural equipment. More in depth analysis of the data would indicate the extent to which this is linked to production changes.

The survey found that acreage reserved for groundnut production increased in both regions: compared to the 40% in 1974, now 56% of the farmers in the Thies sample grow peanuts in fields larger than 7 hectares. In Djourbel their numbers have increased from 43% to 68%. Similar changes have occurred for millet: 59% of the farmers in the Thies sample and 63% in Djourbel grow millet compared to 45% and 38% respectively. While there are no significant changes in the distribution of yields for Thies, the numbers of farmers getting from 500 - 600 kg/ha of millet has increased in Djourbel from 56% to 68% since 1974. The number of farmers has also increased from 30% to 45% for a yield of 50 - 100 kg/ha in other crops (niebe).

4.3.2

3. The project is basically known by the "Souna III" millet variety, whose diffusion in the Thies and Djourbel region is managed by SODEVA. Two-thirds of the farmers from both regions are satisfied with the marketing potential of this variety of millet. However, farmers in the Djourbel region are more likely to be doubtful over its marketing possibility (28% compared to 9% in Thies) and consumption (40% compared to 10% in Thies). These figures confirm the response of 53% of farmers from Thies and 70% from Djourbel, that they have increased their income in past years. Two-thirds of both samples (63% and 61% respectively) have been able to amass a food reserve. It remains that 44% of Thies and 53% of Djourbel farmers believe that they still have needs not addressed by the SODEVA system. Respondents overwhelmingly call for a lightening of women's work load (87% in Thies and 68% in Djourbel), training in homekeeping skills, and increase in their income earning ability and health care. The needs of young people center mostly around employment (75% of Thies) and cultural activities (57% of Djourbel).

4. The farmers in the two regions made specific recommendations regarding desirable changes in SODEVA operations, although some of these extended to questions over which SODEVA probably has little or no control.

a. Farmers wish to diversify their crops and reintroduce sorghum, samio, and improved varieties of niebe. Programs to that effect would be welcome.

b. Programs should be initiated to combat soils degeneration;

c. Delays in the distribution of seeds and agricultural material should be eliminated;

d. Request for a crop insurance program and for greater concern with water shortage;

e. Inhabitants would like to exploit natural resources in their region with State assistance. These activities will create employment for youth and slow their move to larger urban areas.

f. The deconcentration of industries and small scale manufacturing will similarly create more jobs for youth and act as disincentives to migration.

g. The farmers from Thies would like to see the creation of a mutual assistance group for the whole Diobas valley.

h. Farmers would like to be more closely associated, in every phase, with development projects.

i. In view of the scarcity of traditional materials for housing construction, Djourbel farmers would like assistance from the cooperative for obtaining housing materials.

SODEVA: Compte rendu of meeting on Monday May 19, 1980

A technical level meeting was held to discuss the evaluation of the SODEVA Cereals Production Project jointly funded by the Government of Senegal and USAID in the Regions of Thies and Diourbel. M. Djiaye of the Ministry of Plan explained that the technical level debriefings were to elicit corrections, clarifications and observations. Recommendations and findings of the evaluations will be collected together for the Reunion du Synthese to be held at 15:30 on May 22.

M. Magnuson of the Working Committee of the Joint Assessment explained that the SODEVA paper was a short summary of three previous USAID evaluations, the most recent in 1979. The Working Committee was unable to obtain a team of experts to do the evaluation within the time period originally planned. Consideration is being given to undertaking this evaluation in the next few months.

Despite the lack of a formal complete evaluation, a number of observations were made concerning the overall success of the SODEVA program and of USAID's contribution to that program. The major observations were as follows. They are taken from previous evaluations and from data generated by SODEVA.

- o The technical packages disseminated by the SODEVA extension program have not demonstrated increased productivity or overall production. The packages do not suit the needs of the majority of the farmers,

- o There are continuing limitations on the type and quality of data available concerning the project,

- o The benefit-cost ratios and internal rates of return computed for the project are low and negative respectively.

- o While millet production grows gradually there is some doubt as to Senegal's institutional capacity to provide the range of support services required to reach Senegal's aim of cereals self-sufficiency. The needs for efficient credit, processing, transport, and marketing services remain severe bottlenecks in the overall millet system.

- o Finally it was observed that SODEVA, initially an extension program, has been absorbing a wide range of additional tasks. It is taking on new administrative functions such as cooperative management, inputs supervision. It is also becoming increasingly involved with livestock and diverse other crops. It is doubtful that SODEVA, as it is now organized fully cope with these tasks. This is particularly so in marketing.

4.4.2

A number of observations were made by the group.

M. Diallo of SODEVA's Economic Research Office stated that the packages and SODEVA itself had evolved considerably since the project's start. Rainfall is a major factor in productivity increases and a lack of overall production gains should be attributed to that factor, not SODEVA's program. Fertilizer use has steadily increased in the project area. The supply of inputs has generally improved. While there are good production results in the north there are no means for the farmers to market surplus production. It was also noted that it is inappropriate to do a quantitative evaluation of production after only three years of work on the project. The behavioral changes at the farm level which will ultimately increase productivity take a much longer period to be felt.

M. Decoene of SODEVA asked to know on what basis had the cost benefit and internal rates of return been done.

The group also noted that past marketing problems with ONCAD and the removal of ONCAD from the market has created a national marketing problem which should be dealt with immediately. It was noted that there were rather acute difficulties in obtaining production and equipment loans in instances where the private sector also had trouble in getting purchase loans. The problem seems to be located in national banks. The banking problem was also in reference to the private sector which is making the millet purchases. They can't seem to get bank credit for making the purchases, which limits the capacity of the private sector to handle marketing.

The representative of the Ministry of Rural Development observed that cooperation between ISRA and SODEVA needs to be improved at the farm level. M. Diallo responded that the SODEVA II project financed by USAID is encouraging SODEVA's policy of joint field trials for improvement of the technical package.

There was a discussion of the more fundamental marketing problems with millet. The lack of an industrial structure to absorb millet production for transformation was noted. USAID and ITA efforts in creating a millet transformation process were mentioned. Creation of additional storage capacity is blocked because of lack of additional funds. The marketing issue is further complicated by the fact that 1) the internal urban market is not directed toward millet consumption 2) the external markets are closed to Senegal by the comparatively high-cost structure of Senegalese millet in the region.

A series of administrative questions were raised concerning the resettlement of extension workers after the project had been taken over by the rural population. The increased participation of the Government of Senegal in the SODEVA program over the next

4.4.3

years was cited as an issue to be closely examined. M. Dji. ye responded that such issues will be taken up in the negotiation of contracts between the GOS and the parastatals. These contracts will be negotiated on a more frequent basis.

M. Dji. ye closed by saying that the issues raised in the debriefing, particularly in marketing and credit, would be confronted in the plenary meeting on the 27th of May.

THE AID PROGRAM IN SENEGAL.1. BACKGROUNDA. 1961 through 1972

During this period, U.S. bilateral assistance provided 6.5 million dollars in loans and 36.3 million dollars in grants to Senegal in the areas of water resources development, seed improvement, poultry research, livestock improvement, school construction and funding for a variety of technical and feasibility studies. There was also a 5 million dollar housing guarantee provided for a middle income housing project in Dakar.

In addition to the assistance received through bilateral agreements, Senegal benefited from its membership in such AID-sponsored regional organizations as the West African River Development Association and the Organization for the Development of the Senegal River Valley (OMVS).

B. 1973 through FY 1979

The present program began with the drought in 1973. AID was the major food donor providing 50,000 MT of sorghum bilaterally and 5,000 MT through the World Food Program. AID also provided 416,000 dollars to cover the inland transportation cost.

At the same time the food relief program was being implemented, a review of the situation was undertaken to identify needs and areas of privation which could be addressed by short term project activities. Projects totalling 2 million dollars, were launched in 1974 in the areas of village wells construction, rehabilitation of livestock watering points, reforestation, medicines, and equipment for farmers. This program ended in 1976.

As a follow-up to these activities, a mid-term phase of project development was instituted which dealt with more complex problems. The solutions of these could not prevent future droughts but would greatly alleviate the adverse effects of a recurrence of the conditions found in 1973. Projects implemented in this medium-term phase spanned from three to five years and were financed by a special congressional appropriation of 85 million dollars for the Sahel provided in FY 1974.

During this time, AID was defining its strategy in Senegal to assist the Government of Senegal (GOS) to reach the rural areas with development programs and to achieve food self sufficiency. The introduction of improved agricultural technical packages in dry land farming areas of the Peanut Basin, development of irrigated agriculture in the Senegal and Casamance River Basins, livestock and range management in the pastoral zones of northern and eastern regions of the country and programs in rural

health delivery systems were the thrust of this development.

From these modest beginnings, 1961-1974, AID development assistance, from FY 1975-1979, totaled 64 million dollars, 40 million dollars for bilateral development projects and 24 million dollars for PL 480 Title II activities. The FY 1980 program is budgeted at 27 million dollars and the proposed FY 1981 program totals 29 million dollars.

The conceptualization of this program and its ultimate funding were almost wholly dependent upon the establishment of the Club du Sahel and the growth of the CILSS as a Sahelian organization for planning and coordination. This provided the strategy framework for project design and assured the support of all key donors.

II. PROJECT ACTIVITIES - DESCRIPTIONS

1) Cereals Production Project, Phase I and II

	(0201)	(0235)
Project Duration	Phase I: FY 1975-FY 1979	Phase II 1980-1984
Total Cost:	\$4.7 million	\$7.7 million
Funded to Date:	\$4.7 million	\$1.5 million

The project was designed to assist SODEVA, the development agency of the Groundnut Basin, in reaching farmers through extension services to intensify agricultural practices and increase the production of millet, the staple grain of the majority of the rural population. The major intent of the project was to provide an alternative to rice imports which drain the foreign exchange reserves. The first phase of this project ended in December, 1979. A second phase, a 5-year, 7.7 million dollar project was funded at that time. This phase is intended to improve the quality of extension agents in order to reach a larger audience through upgraded technical skills and improved audio-visual techniques; involve the entire farm family in the economic benefits as women are important contributors to grain production; diversify cropping patterns to ameliorate the effects of drought; and fund research themes that are directly useful to the extension efforts.

AID inputs will include technical assistance, training and operational support. Operational costs will be gradually assumed by the GOS over the life of the project. Some 600,000 rural inhabitants in the regions of Thiès and Diourbel will benefit from the program.

2) Senegal Range and Livestock Development, Phase I and Phase II

(0202)	(0236)
Project Duration:	FY 1975-1980
Total Cost:	\$3.1 million
Funded to Date:	\$3.1 million

This project consists of 130,000 hectares of range land comprising two separate zones. It is designed to improve living conditions and increase incomes of the participating herders. This is being accomplished through introduction of controlled grazing, improved management programs, and organized marketing schemes. In addition, access roads, firebreaks, and livestock water reservoirs are being constructed to facilitate rotational grazing in order to balance animal/plant resources.

The entire technical staff is now on site in Bakel. The project head-quarters facilities are complete and functioning. A training center located in the Toulekeddi zone is essentially complete. Herders are now participating in project activities which will lead to improved herd productivity and increased incomes while maintaining fewer cattle in proportion to traditional herds.

3) Casamance Regional Development Project

(0205)	
Duration of Project:	FY 1978 - FY 1984
Total Cost of Project:	\$23.7 million
Funded to Date:	\$ 6.2 million

The largest project in AID's portfolio, the Casamance Regional Development Project, will assist the GOS to acquire the expertise to design and implement regional development plans.

Phase I which is currently under way, is intensifying rice production methods through extension and will result in long-term planning studies and institution building. The project is providing the services of ten technical assistants (four of whom are presently stationed in Ziguinchor, the regional capital to work with GOS agencies involved in planning, extension and research). Two institutional contracts, one with a U.S. consultant firm and the other with a U.S. university are being negotiated. Technicians provided by these firms will be on-site by the end of the year to assist the regional development agencies in drawing up a master plan for the development strategy of the area.

4) Bakel Irrigated Perimeters

(0208)

Duration of Project: FY 1970 - FY 1982
 Total Cost: \$6.6 million
 Funded to Date: \$4.7 million

This project is introducing irrigation techniques to twenty-five villages along the Senegal River around Bakel in Eastern Senegal (involving 1,800 hectares). A U.S. technical assistance team is on site to assist the development agency of the Senegal River Basin to carry out the scheme. Pumps have been delivered and farmer groups are participating. Area planted during the first two cropping seasons of 1979-80 was approximately 460 hectares of rice, corn and vegetables. The rice averaged four tons per hectare.

A component to test the feasibility of a solar powered pump for irrigation of approximately 200 hectares was added to the project in 1978.

5) Grain Storage Project

(0209)

Duration of Project: FY 1977 - FY 1980
 Total Cost of Project: \$4.9 million
 Funded to Date: \$4.9 million

This project is designed to assist the GOS to meet cereals storage requirements. The project will also insure security storage facilities during droughts to ameliorate their effects. Under the program, 30,000 MT of warehouse space will be built in twenty-three locations throughout Senegal. U.S. technical assistance for training of GOS personnel in grain handling and storage techniques is also included in the project. All warehouses are presently under construction, with completion anticipated by August, 1980.

6) Rural Health

(0210)

Duration of Project: FY 1979 - FY 1980
 Total Cost: \$3.36 million
 Funded to Date: \$3.4 million

The project assists the Government of Senegal in developing preventive health delivery systems capable of reaching the rural populations. It will establish a replicable model which could be applied in the other regions of Senegal. This project entails infrastructure development; training of village health workers; retraining existing health personnel; establishing a comprehensive supervisory system; provision of health supplies; and budgetary support on a diminishing basis.

5.3.5

Over 200 of the 600 village health huts programmed under the project have been constructed and supplied with basic medicines; 950 health workers have received training and have returned to their villages to work, and a network of higher echelon health posts has been established. The villages are receiving medicines that were supplied by the project. It will now be up to them to continue this system by establishing a revolving fund from the monies earned from the sale of medicines.

Because the GOS has been encouraged by the success of this project, it has requested that AID consider a similar activity in the region of Thiès. This program will be developed in FY 1980.

7) Family Planning

(0217)

Duration of Project:	FY 1979 - FY 1982
Total Funding:	\$1.4 million
Funded to Date:	\$882,000

The aim of the project is to offer contraceptive care and advice in ten primary MCH centers and nine-teen secondary centers, and to offer referral and education services in 33 maternity centers. The target is to reach 1,300,000 persons among which are 270,000 women of reproductive age. This project has not yet started pending resolution of which ministry will implement it.

8) SAED Training Project

(0218)

Duration of Project:	FY 1978 - FY 1983
Total Cost of Project:	\$4.5 million
Funded to Date:	\$2.7 million

The SAED training project is a joint AID/FAC/GOS activity to upgrade the skills of the personnel of the Senegalese River Basin development agency, and to strengthen extension work directed towards farmers participating in irrigation schemes along the river. AID's contribution is for repair of heavy and light equipment, training of equipment drivers and instituting a system of spare parts management. A contract with American ORT Federation has been negotiated for the training aspects of the project and the first two technicians are expected to be on site by June 1980.

9) Fuelwood Production

(0219)

Duration of Project: FY 1979 - FY 1983
 Total Cost of Project: \$3.1 million
 Funded to Date: \$2.1 million

The purpose of this project is to assist the GOS in the development of an easily replicable fuelwood production system to provide alternate sources of charcoal and fuelwood. If fuelwood consumption at present rates continues, the country's forest reserves will be depleted by 1998.

AID's resources to the project will include a technical assistance team, production of 3,000 hectares of trees, development of Senegalese expertise in the management of fuelwood production projects, and some local forestry development at the village level. If the project proves successful, 5% of the annual officially marketed fuelwood demand in Senegal will be met. A second phase of the project will then be introduced to provide an additional 3,000 hectares of trees.

10) YMCA/ORT Youth Job Development - OPG

(0222)

Duration of Project: FY 1979 - FY 1981
 Total Cost of Project: \$1.8 million
 Funded to Date: \$900,000

Under a grant from AID, the YMCA will work with the GOS to build a system of vocational training services enabling Senegalese urban youth to acquire marketable technical skills. Follow-up job placement is also provided.

Financed by the GOS, the construction of the training center in Dakar is 60% complete. It is expected to be operational by September 1980. Courses in textile skills, construction trades, electricity and general mechanics are already being given.

11) Agricultural Economic and Farming Systems Research and Planning

(0223)

Project Duration: FY 1980 - FY 1984
 Total Cost of Project: \$4.6 million
 Funded to Date: None

This project is being designed to assist the National Agricultural Research Institute (ISRA) to decentralize its research activities. As now envisioned, this will provide the Ministry with:

- a) an improved understanding of present farming systems in the major agro-ecological zones and of the social, economic and technical constraints of farm-level decision making;
- b) recommendations to direct policy and institutional impacts on the development of the crop and livestock subsectors.

AID's support to the program will be the training of Senegalese in agricultural economics and rural sociology. Technical assistance will be provided while Senegalese are in training. Donors, besides AID, participating in the program will include World Bank, France and Belgium.

12) SODESP Livestock Production

(0224)

Project Duration: FY 1979 - FY 1984
 Total Cost of Project: \$8 million
 Funded to Date: \$3 million

The project aims to modernize livestock production around four deep-bore wells in northern Senegal. It addresses in two successive phases the problems of the livestock productivity and deteriorating range resource conditions. This activity will train herders in improved livestock production, reforest areas around the well-sites and family compounds, improve herder family health care and nutrition, and establish a continuing resource management program. These activities will take place in a fifteen kilometer radii around four well sites comprised of 280,000 hectares. Each year, 5,000 cattle units will be improved and 1,400 will be destocked for slaughter. Similar numbers of sheep will be upgraded and marketed.

AID will fund technical assistance to work with the development agency of the Sylvo-Pastoral Zone now being evaluated. Selection of the firm for this is expected during May 1980.

Infrastructure at the headquarters of the zone is under construction. The contractor is on site and this segment of the project should be completed during 1980.

13) National Plan of Natural Resources

(0233)

Project Duration: FY 1981 - FY 1983
 Total Cost of the Project: \$1.8 million
 Funded to Date: 1 million is programmed for FY 1980

The purpose of this project is to prepare a resource inventory based on remote sensing in order to plan and program use of the country's physical resources in a more coherent, economic manner.

The plan is to provide the broad framework within which development planning as well as the design of projects will be undertaken. AID was requested to provide the first phase of studies by use of remote sensing in technology, using the facilities of a U.S. university and NASA. UNDP will assist in carrying out the actual work.

14) Sahel Crop Protection

Project Duration:	FY 1977 - FY 1982
Total Cost:	\$5.6 million
Funded to Date:	\$1.5 million

This project is an eight nation integrated pest management project designed to assist national crop protection services combat insects and pests that destroy some 20% of the food grains each year in the Sahel. Training, equipment and technical assistance are being provided to assist in this endeavor. Senegal has directly benefited from this project through the construction of a regional crop protection training center near Dakar which is now operational. In 1980, 100 crop protection agents are planned to be trained in this center. The Project Manager resides in Dakar.

III. ACCELERATED IMPACT PROGRAM (AIP)

The Accelerated Impact Program is designed to address priority short-term needs relevant to Senegal's rural population. The program consists of short-term activities, selected by the GOS, particularly with respect to food-crop production, nutrition and non-formal education of rural populations. The projects financed under the program are usually pilot in nature and if successful, will ultimately lead to larger, more complex activities.

1) Renewable Energy

(0238)	Project Duration:
Total Cost: \$300,000	

This is a pilot project to test improved energy conservation techniques in solar fish drying, charcoal production, and introduction of wood burning stoves. If the pilot phase proves successful, a second phase of five million dollars for a similar project will be developed.

2) <u>Caritas Village Groups</u>	(0239)
Project Duration:	5/23/79 through 5/23/81
Total Cost:	\$212,000

This project will encourage subsistence farm families in the M'Bour area to vary their crop production. Community development

training will be supported through funds provided to an existing training center. A truck to help in marketing the vegetables grown in the project area will help supplement the villager's earnings. Motor pumps are also being given to villages that have shown an ability to produce vegetables using hand pumps.

3) Lowland Fisheries

(0240)

Project Duration: 8/23/79 through 8/23/81
Total Cost: \$180,000

The project will introduce fish culture to the Senegal River Valley by establishing six village demonstration ponds to be supported by a fingerling production center in Richard Toll. In addition, the feasibility of fish production in conjunction with rice culture will be examined by the project.

IV. GRANTS TO PRIVATE VOLUNTARY ORGANIZATIONS (PVOs)

In addition to the grant to YMCA to carry out job development training for urban youth, AID is also working with other PVOs in areas that are consistent with AID's development plans and the capabilities and interests of the PVOs themselves. These are:

1) NCNW Skills Training Research and Feasibility Study

(0244) \$160,000

This project is being developed by the National Council of Negro Women to provide baseline data concerning Lower Casamance women in their roles in agricultural and livestock production, in the economic development, and in the family economy, as well as the skills needed to enhance their socio-economic role. Future economic possibilities for these women will be studied in light of the greater mechanization of rice production and continuing or increasing migration. A skills training center is expected to be designed to respond to the women's specific needs.

2) AFRICARE Reforestation Project

(0243) \$126,000

This project will introduce woodlot production into five villages establishing 20 hectares of rapid growing fuelwood species in each village over a two year period, to alleviate rural fuelwood shortages. The woodlots will provide both wood and wind breaks to villagers participating in the program.

3) AFRICARE/Peace Corps Woodlot Project \$500,000

Now under design, 40 villages would ultimately benefit from this program to establish village woodlots for fuelwood production. Eight Peace Corps volunteers will be involved in the project. FY 1980 funding is anticipated.

4) Assistance to Catholic Relief Services (CRS)a. Wassadou Project: (\$438,000, Generic Grant, \$419,000 OPG)

To expand agricultural activities of Wassadou and Bantantinting Cooperative farming program. Provide material and interim financial support to increase irrigated cultivated land by 300 hectares.

b. Casamance Fishing: (\$258,000, Generic Grant) The purpose of this project is to provide the 35 newly-formed fishing cooperatives with fishing equipment, such as outboard motors, nets, floats, ropes, etc..

c. Casamance Wells: (\$582,000, Generic Grant) The purpose of this project is to provide year-round, durable and drought resistance sources of potable water to 100 villages in the Casamance by constructing 100 hydraulic wells.

5) Ronkh Topographical and Pedological Studies

(0245)

Project Duration: 8/23/79 through 8/31/80
Total Cost: \$70,000

The project will generate topographical, pedological and other pertinent data upon which to base a judgment concerning the feasibility of the Ronkh Village.

V. WOMEN IN DEVELOPMENT PROGRAM

Senegal's Women in Development Program is designed to improve women's economic and social well-being and to assist them in exerting a more decisive role in development of their milieu. As such, the specific WID projects seek to alleviate the heavy burden of daily tasks performed by village women, to offer as work alternatives a variety of economic and social activities within pre-cooperative structures, and to improve the quality of village life through programs which increase incomes and promote women's roles in rural development. In addition to specific projects, women's activities are being written into all major projects that are funded by AID.

1) Kassack Nord WID (\$25,000)

SAED is implementing a pilot project with the women of Kassack Nord involving vegetable production, rice production, literacy training, a village fabric dyeing cottage, poultry production, a millet machine, training in nutrition and hygiene, a health post and a village maternity.

2) Tivaouane WID (\$210,000)

This project is testing out the cooperative approach to a series of economic and social activities that can be replicated in other villages in Senegal. Project's components include millet mills, village wells, sheep raising, cultivation of manioc and niebe, reforestation, and village pharmacies in thirteen villages.

VI. PL 480 TITLE II AND TITLE IIIA) TITLE II

The FY 80 PL-480 Title II program provides nutritious foods valued at approximately \$6 million per year to about 221,000 recipients. It is administered by Catholic Relief Services (CRS) through the maternal and child health program (MCH) of the Government of Senegal, operating in 327 centers throughout the country.

The objectives of the program are (1) to provide critical nutrients to the vulnerable group of children and mothers; (2) to provide mothers with education to combat malnutrition and infection; (3) to reduce infant morbidity and mortality, lessen the rural family's expectation of infant death, and thus support family planning efforts.

Eighty-nine percent of the recipients are in the vulnerable population. Eight percent of the recipients are adults engaged in work projects designed to grow more food and then receive Title II feed as partial payment for work. Three percent of recipients are aged and infirm adults who are unable to purchase sufficient feed.

B) TITLE III

PL-480 Title III legislation makes available dollar loans to purchase U.S. food where the repayment of principal and interest is made in local currency when these currencies are expended in mutually agreed upon development projects.

The Title III agreement of \$7 million per year for three years was signed on May 16, 1980. This will generate \$21 million for rural development through the sale of 15-25 thousand metric tons of U.S. rice annually.

The development projects are designed to improve the quality of life of the rural majority and must be additional to on-going development efforts by the Government of Senegal. They are as follows:

USAID/GOS TITLE III PROJECTS

1. Agricultural Policy Studies, to finance price, marketing and investment analyses.
2. Local Cooperative Storage, to provide 100 warehouses at village coop level.
3. Decentralization of Research, to organize research by ecological regions; relate research to problems of production.
4. Rural Technical Schools, to upgrade facilities and staff at National School for Applied Economics and National School of Rural Technical Personnel.
5. Reforestation and Dune Fixation, to stabilize sand dunes and protect valuable vegetable producing land.
6. Development Fund, to support small community-level development projects.

VII. THE OMVS

The Senegal River Basin Development Organization (OMVS), a regional organization composed of Mali, Mauritania and Senegal, and its predecessor agencies, have concluded over the last 15 years that a long-range integrated development plan is possible within the Senegal River Basin. This conclusion is based on recommendations of several internationally financed basin studies and on nearly a century of planning. The cornerstone of this plan will be the construction of a salt-water intrusion dam at Diama, Senegal and an upstream multipurpose reservoir at Manantali, Mali. Although financing is about \$130 million below the necessary amount, the OMVS considers financing almost assured, barring unexpected difficulties. Bids have been received for Diama and it is anticipated that proposals will be solicited shortly for Manantali. Construction of Diama may begin in mid-1980; it is being delayed for several months while financial and contracting problems are resolved.

With financing nearly assured the OMVS is turning its attention to ancilliary development along the river. Responsibility for development of the area around the Basin is charged to the member states. OMVS is responsible for coordination of these efforts. However, the OPEC states, at the recent donors' meeting held in November, were very emphatic that the OMVS should have its mandate extended to allow it to take a leading

role in agricultural development of the area. The OMVS, we believe, supports this idea but changing their mandate is a political decision of the member states.

USAID support of the OMVS program is consistent with support of other regional programs, and USAID is prepared to increase its assistance to the OMVS in collaboration with other donors to carry out the OMVS' integrated development plan. The OMVS envisages developing up to 375,000 hectares by the year 2025 with the changeover from flood recession to irrigated agriculture.

U.S. OMVS Activities

Agronomic Research II Project (625-0605)

Duration of Project:	Phase I	FY 78 - 80
	Phase II	FY 80 - 82
Total Cost of Project:		\$6,190 million
Funded to Date:		\$873,000

This project consists of two phases. Phase I (18 months) is to plan and design a viable applied research program for irrigated and rain-fed crops at the three OMVS research centers in Fanaye (Senegal), Kaedi (Mauritania), and Same (Mali). Phase II (3 years) will be the construction and implementation of the program planned in Phase I. This will include rehabilitation of the three research centers, as well as construction or rehabilitation of irrigation and drainage systems.

Progress to Date: The University of Arizona, which is supplying technical assistance, has conducted preliminary missions to the research stations and is now preparing plans for improvements to the stations and a research program.

Environmental Assessment Project (625-0617)

Duration of Project:	FY 76-79
Total Cost of Project:	\$3.7 million
Funded to Date:	\$3.5 million

This project provided a comprehensive assessment of the effects of major infrastructure on river basin ecology and produced 15 sectoral reports covering such impact areas as agriculture, health, water quality, ground-water, fisheries, socio-economic conditions, forestry, etc.. These reports will provide the data base for the OMVS to plan new undertakings in the Senegal River Basin by capitalizing upon beneficial effects and mitigating adverse ones.

Progress to Date: The sectoral reports have been synthesized into a comprehensive report which was reviewed and accepted, subject to some changes by the OMVS technical committee January 16-18, 1980. Recommendations made in the report will influence

the design of irrigation and other rural development along the river. Some of the recommendations will be implemented in the proposed new OMVS Integrated Development Project and in a second proposed new project on groundwater monitoring.

Data and Institutional Development (625-0620)

Duration of Project: FY 77 - 80
 Total Cost of Project: \$9.5 million
 Funded to Date: \$7.5 million

This project will enable the OMVS to plan and execute development programs in the Senegal River Basin by having accurate ground control and aerial photographic contour maps to develop up to 255,000 hectares at the end of the project.

Progress to Date: As of April 15, 1980, all of the aerial photography at the 1:10,000 and 1:20,000 scales has been completed for Senegal, Mali and Mauritania. Sixty-one percent of the aerial photography at the 1:50,000 scale has also been completed for the three countries. The balance of the 1:50,000 scale will be flown December 1980 - January 1981, during the next flying season, which is determined by weather and dust conditions.

In addition to the above ongoing projects, the U.S. has provided assistance to the OMVS for the following studies:

Fiscal Allocation Responsibility - This study is assisting the member states to determine the economic benefits which will accrue to each state once the Manantali and Diama Dams are constructed, to allocate investment costs, and to plan more efficiently the use of the water resource (\$186,000).

Socio-Economic Study - This study, carried out by the United Nations, collected basic social and economic data in the Senegal River Basin area. USAID's contribution enabled the U.N. study to extend its observation and data collection season by six months (\$200,000).

5.3.1.

MACRO-ECONOMIC REVIEW OF CONSTRAINTS IN SENEGAL AND DONOR ACTIVITIES.

The purpose of the joint assessment is to develop the basis for a joint planning exercise. Fundamental to this is an analysis of the needs of Senegal. It was originally intended to do this by a "constraint matrix" but that was not feasible (See Appendix I). In its place a more aggregate analysis was made, based on an analysis of the Government of Senegal's historical development objectives, as reflected in a review of the five post-Independence Four Year Plans (See Appendix II) and other documents such as the World Bank report on Senegal. Next an analysis of major constraints to achieving those objectives was undertaken. As was expected, considerable overlapping of various constraints and objectives occurred. For example, lack of enough revenue of the government to cover recurrent costs is a constraint but this is due to the lack of growth of the economy which in turn reflects a myriad of other constraints.

Finally, once a general grouping of constraints was arrived at, an analysis of aggregate donor activities related to these constraints was done.

Senegal's development objectives

The document indicates five major development objectives of the Government of Senegal. These are:

1. Increase national output and income through greater agricultural and industrial production.
2. Expand exports while reducing imports through diversification of the economy particularly its agricultural production. As a sub-objective, this should lead to increased food security through greater food self-sufficiency.
3. Increase indigenous control over the economy by two means: 1) Senegalization - the replacing of expatriate administrators and technicians by qualified Senegalese, and 2) Participation - the purchasing by the State of controlling interests in major industry (this policy ended in 1978).
4. Encourage greater regional economic spread of development and its benefits through increased administrative and economic decentralization. A sub-objective is the increased "socialization" of peasant farmers via government created institutions.
5. Increase government revenue while controlling the rise of government expenditures.

Constraints to achieving these objectives

An analysis of Senegal's post independence economic progress highlights a number of constraints that impede the achievement of the above stated objectives. These constraints, for analytical purposes, can be grouped into six major categories. It is difficult to make such groupings because of the high degree of intercorrelation of one constraint to another. Nevertheless, such classification is useful as an analytical tool.

The analysis points toward a general constraint that crosses through all categories. This is the limited productivity of Senegal's institutional and physical resources. The low level of efficiency of the resources available to Senegal (land, water and manpower to government institutions) is seen in their output to the economy and the society as a whole. Let us examine the six constraint categories in detail.

The six categories of constraints are in three areas: 1) macro-economic, 2) resources, and 3) technology. There are three principal macro-economic constraints categories: 1) monetary (revenue), 2) savings/investments and 3) balance of payments. Two categories of resource constraints can be identified: 1) human resources and 2) physical/natural resources. The final category is a technological constraint.

I. Macro-economic constraint

1) Monetary (revenue)

GOS tax revenues have risen less than 0.7% a year between 1962-77 in real terms. Meanwhile, population has increased by at least 2.5% a year and demand for government services has increased accordingly. A large (40% of GDP) parapublic sector is drawing more resources from the public coffers than it is putting into it (4 billion CFAF in 1974). To cover these and other development expenses, the government has gone onto the world money markets for loans leading to public debt that will require at least 28% of the total 1980 earning of exports just to service. Basic to all of this is a stagnant economy that provides no means of increasing government revenue.

2) Saving/Investment

Senegal has an enormous need for additional social, communication and production related infrastructure. In the agricultural sector there is a need, over the next 10 years, for tens of millions of dollars in basic production infrastructure including feeder roads, wells, pumps, markets, etc. This does not count the hundreds of millions of dollars needed for

5.3.3.

primary infrastructures such as dams, and primary roads. Without this massive investment Senegal has little hope of feeding itself or achieving any form of economic growth. But where will this investment come from? Senegal faces major savings and investment constraints. Domestic savings have varied greatly depending on the peanut crop but have averaged about 9% of GDP since independence. Yet, to have even modest economic growth, the World Bank estimates a need for an investment rate of 14% of GDP.

Private investment is low. After independence, major disinvestment occurred in the private sector. This stopped some 10 years ago but since this recovery occurred, the rate of increase in private investment has been nil. Reasons for this include government policy that discourages active private investment and an extremely limited local market. More importantly, is the low productivity of new investments in Senegal as is seen in the extremely high capital output ratio of 6.5.

Lack of investment, particularly from the private sector, has meant extremely limited employment possibilities in the urban sector and almost non-existent non-farm employment opportunities in the rural sector.

3) Balance of Payment

The lack of diversity of Senegal's economy has resulted in its exports being chiefly limited to two products (peanut products and phosphate). It has no control over the price it receives for these goods and with peanuts, no control over the amount it can produce. While export earnings are hence unpredictable, import costs, primarily for food and petroleum, continue to rise. Senegal imports about 700,000 MT of oil a year. From 1973 to 1977 Senegal's oil import bill increased 450% from 4.7 billion CFAF to 20.9 billion CFAF. Senegal has had a continual small trade deficit since independence but after 1974 this deficit sharply increased. In 1974 Senegal had about 3 billion CFAF deficit in foreign reserves, an amount it had carried with the BCEAO for some time. But in 1975 it began to suffer huge drops going to a negative 25 billion CFAF and continuing to fall to a negative 60 billion CFAF in 1979. This severe balance of payment problem is now a major constraint on further growth in the economy.

II. Resources

1) Human Resources

Senegal appears blessed with a major university and a large cadre of trained people yet it still suffers from major human resource constraints. While the university exists, the bulk of its students are trained in liberal arts, a field

5.3.4.

not critical to the development needs of the country. It is instructive to note that as an agricultural country with large investment in higher education, it still can not train agricultural scientists. Lawyers yes, agronomists, no.

More telling is the fact that even though it can train its own doctors, over 85% of its population are illiterate. Twenty years after Independence, only a limited beginning of practical/vernacular education has started.

Lack of proper education has meant that labor productivity is very low at all levels, from the upper levels of government, where its basic management capacity is over-extended, to the lowest farmer, who continues to farm the way his ancestors did. Not only is labor productivity hindered by lack of proper education but also by lack of most of the other social services, particularly health. These services are oriented away from the bulk of the rural and poorer population, the major potential productive force of the country.

Compounding the low level of productivity of human resources is the massive increase in population growth that strains the ability of the existing systems to deliver even meager levels of services. In urban areas this situation is made worse by the huge inflow of rural migrants.

2) Physical/Natural Resources

The vast majority of Senegal's agriculture is rainfed. Over the last 20 years this rainfall has been neither abundant nor regular. During this period five major droughts have occurred. Besides water, productive agriculture needs good soil. Senegal unfortunately does not have much of this basic resource. In parts of the Peanut Basin and the Fleuve Delta, heavy clays exist that are hard to farm. Along the major river banks, salt intrusion makes soils unusable much of the year. In Eastern Senegal, a vast underpopulated area, large tracts of ferrogenous crust make the land unusable.

In those areas where the soils are good, rising population, increasing desertification from the drought, and reduced fallow have all contributed to declining soil fertility. Limited rainfall and poor soils also curtail possibilities of crop production alternatives to the present millet and peanuts.

As a further constraint on the use of natural resources, in those regions of high potential agricultural growth (southern and eastern Senegal) endemic diseases of sleeping sickness, river blindness and malaria abound, discouraging the settlement of populations.

III. Technology

Many of the above noted constraints would be alleviated or eliminated if proper technological packages were available. Unfortunately, they do not exist yet. The areas of the greatest agricultural production potential (Fleuve, Casamance and Eastern Senegal) have had only the most limited agricultural research done and that only in the last few years. In the Peanut Basin, where research has been going on for over 50 years, only a modest increase in millet yields can be attributed to these efforts. Peanuts, the mainstay of the economy, has had no increase in yields in over 20 years. This lack of adequate appropriate technology has been an important constraint on growth of the economy.

Donor Activity and Constraint Categories

By pairing up aggregate donor activities with the six constraint categories, a number of observations can be made.

1) Monetary (revenue) constraints

While most of the other five categories have a substantial number of donor assistance projects to relieve or aid in resolving the constraint, this category has only three major donor actions. They are, however, very important in scope and size. While these activities relieve pressure on this constraint they are, in fact, responding to another constraint category - the balance of payment problem. The first action is the \$83 million dollars allotment from the STABEX fund of the EEC/Lomé Convention. This fund compensates Senegal for losses in export revenue due to fluctuation in World market peanut oil prices. The OPEC balance of payment assistance falls into this same type of assistance to compensate Senegal for increased oil import costs.

But this assistance really does not aid in solving the basic problem - a stagnant economy leading to stagnant tax revenues and an inefficient, resource absorbing parapublic sector. The IMF's fund-by arrangement and related loans do address this more fundamental problem. This is the third major donor action in this category. This assistance suggests to Senegal what policy path to take to solve these fundamental problems and provide an important sum of money to encourage it to do so. They do not, however, provide the means to effectively carry out and sustain these reforms.

The IMF sponsored reforms will result in increased temporary unemployment and generally lower real purchasing power of the urban population. Softening these effects, while not reducing their impact, will allow the government more political freedom to implement and sustain these

necessary measures to redress the economy. Donors can play an important role in this area.

2) Savings and Investment

There is considerable donor activity related to the savings and investment constraint category but as is seen in other areas, the major efforts are to relieve symptoms, not to attack basic causes of the problems. In essence, donors are picking up the tab on investment in infrastructure that the Senegalese can not undertake themselves due to low levels of public savings and indigenous investment. Thus donors are actively involved in construction of roads, airports, telecommunication systems, factories, hotels, and industry. This of course leads to two possible long run consequences. 1) Even though much of this assistance is grants and/or concessional loans such investment still increases Senegal's debt burden and 2) these investments also increase future recurrent cost obligation on the government to maintain.

Few if any donor activities are directed to the basic causes of low investment and savings, the low productivity of investment made within the country, and the non-functioning financial market. There is a greater return on an investment to build villas on the outskirts of Dakar, which are of little use to the society or economy, than on investments in agriculture or industry which are so badly needed.

Donors assume that the basic investment made by them will provide the basis to generate future economic growth that can begin to create internal savings to expand further investments. The linkage between these various points is tenuous at the very least. More direct assistance is needed to increase capital and labor productivity which is a function not only of investment in appropriate productive equipment and technology, but also human resource development, particularly in better management of the resources firms have at their disposal to increase their efficiency and their returns.

Again it is also assumed that increased investment, both public and private, will increase employment opportunities. Here again, in practice the linkages between the two are often not so apparent. There is a marked lack of action in direct employment generation. Donors should consider increasing productive employment opportunities, particularly in the rural sector.

5.3.7.

3) Balance of Payments

Both OPEC and the EEC, through the Lomé Convention, provide balance of payment support to Senegal. France also provides some direct balance of payment support. In this type of assistance we again see the donors attacking the symptoms and not the causes of the problem.

A principal cause of Senegal's balance of payment problems is the lack of diversification of Senegal's economy, particularly agriculture. This had resulted in depending on a single unreliable export crop for the bulk of the country's foreign exchange on one hand, and the need to import large quantities of food on the other. The rise in oil prices has exacerbated the problem but this is an issue that, at least in the short run, neither Senegal nor most other countries can do much about. But the diversification of exports and the increased production of food, particularly rice, can and should be dealt with directly.

Fishing is the only major sector that donors are now working in that could produce alternate export products. Other possible export goods should be investigated by donors, particularly where they might increase off-farm employment.

There is considerable donor activity in the area of food production to reduce import needs, particularly of rice. Unfortunately, results of these programs have not been impressive. There is reason to hope, however, that increased investment in the Fleuve and Casamance region should turn this around and lead to greater self-sufficiency in rice.

A particularly useful program in this category is the recently signed PL 480 Title III project which attacks both the symptoms and the causes of the balance of payment problem. Grants of rice reduce import needs saving foreign exchange, while receipts from the sale of this rice is used to increase food production. This should lower future import needs.

4) Human Resources

Most of the donor work in the human resource area is devoted to higher education, much of it training in technical fields. Practical education at low levels has only minor donor support, principally from the World Bank. Literacy training, for example, has virtually no donor support. There is, however, a fairly large middle level technical training component in many production oriented projects.

In the population and health area, much emphasis is still put on curative, hospital based health care but increasingly

5.3.8.

outside of Dakar. There are also major projects in basic health care in the poor regions of Dakar and at the village level. Village water supplies and urban sewer drainage are also important areas of donor involvement.

Family planning has had only minor donor activity with USAID in the vanguard. Problems of urban migration are only indirectly addressed by donors and then only in a tenuous way.

5) Physical/Natural Resources

Since the drought in the mid-1970's, there has been extensive donor work in trying to reduce the constraint to growth of physical and natural resource limitations. The magnitude of the problem and the long gestation period before these efforts will show results, require continual and expanded donor support in this area.

Water control via dams, wells, pumps, etc. is and will be a continual priority area for donor investment. At the same time, greater efforts will be needed to save and refurbish dryland areas now in a state of decline. Renewable resources of forests also need expanded attention.

An important area of donor neglect is the eradication of major endemic diseases in Eastern and Southern Senegal that prevent the exploitation of potentially productive lands in these areas. Expanded donor efforts are also needed to resolve obstacles in use of problem soils - heavy clays, saline and laterite.

In the long term, there is also a need to explore alternate resources particularly in energy and to explore and exploit potential mineral resources other than phosphates.

6. Technology

The principal technological constraint lies in agricultural production. Fifty years of principally French assistance in this area has not produced major results (millet being a possible exception). The proposed decentralization of agricultural research programs under the World Bank offers considerable hope of improved performance in this area.

In other areas of research, alternate energy seems to have the next priority. Here much of the work to be done is still at the level of basic research, a job that is more effectively done in the laboratories of the developed world where resources are more readily available.

5.3.9.

Besides the six general categories of constraints noted above, there is a general constraint that runs throughout all of them. The lack of productivity of the physical and institutional resources of the country. One can point to any number of exogenous variables (rainfall, international terms of trade, etc.) as causing Senegal's present problems. While they contribute, they are not the basic problem. Most of the economic and development activity in Senegal uses as much or more resources than they produce. Example of the inefficiency of institutional and physical resources can be seen from the highest level of the economy to the lowliest peasant. Elliot Berg for example, in an overview of Senegal development effort (Annex III) points out the inability of RDA's to deliver services to farmers at reasonable cost even after massive influx of donor resources. The Bakel irrigation evaluation speaks of pumps that should last 20 years falling apart in 2 because of improper use and care.

Unfortunately, examples like these can be repeated hundred-fold. The implication of this on Senegal's development is profound. Economic growth depends on more resources (output) being produced by a society than that required (inputs) to do so. The more efficient this input-output transformation is the greater the growth potential.

Senegal must direct itself to increasing the efficiency of the use of its resources. The land, the farmer, the inputs (pumps, fertilizer, etc.) as well as the institutions (cooperatives, RDAs, etc.) must all be examined to see how they can produce more, do more with less cost and effort. What is needed, in effect, is a state of mind which could be called a "growth mentality".

What that means can be seen by looking at a place where such a mentality exists - Japan. In a recent report on Japan (1) it was noted "The main secret behind (Japan's) economic and social advance is the simple one of a relentless daily productivity hunt. The dividing line between successful and disastrous organizations in the world today is between those where the working force plans hourly for greater output tomorrow (call these enterprising) and those where most people are concerned to avoid any bothersome disturbance tomorrow (call them bureaucratic). Japan's main achievement has been to keep (itself) in the enterprising category. "Senegal must begin to move itself to this same enterprising category.

- (1). Norman Macrae. "Must Japan Show" the Economist, 23-29, Feb. 1980.

5.3.10

What role can donors play in all of this? Evaluations of not only the USAID but other donors' projects too often find that they are not economically sound. As Ferguson noted in his evaluation, a large number of donors have put funds into RDAs to create and expand them but evidence is that the RDAs are too costly for what they yield.

Donors have to develop their projects so Senegal will receive benefit from them not just additional recurrent cost and greater bureaucracy. Efficiency and productivity as the criteria for projects does not mean that so called social projects should not be undertaken. Quite the contrary, they may in many ways be more "productive" than classic production projects. It depends on the gestation period between the initial investment and the reaping of returns. Education programs may take 25 to 30 years before the "pay off" occurs but evidence indicates that proper education programs have extremely high returns when the "pay off" finally arrives.

It is in these long term project where real productivity most often can occur. For example, agricultural projects have 10-15 year gestation period before full productivity occurs but only if donors must consider the need for long term, more fundamental projects in their development portfolios.

In the short term, donors must begin to propagandize the need for productivity in their projects and the government programs. In the same vein as women in development, basic human needs, poorest of the poor, growth with equity, etc., must come productivity of resources. Projects must be oriented not to increase production (more health huts, more hectares of irrigation, more tonnage produced) but to increase productivity (more health service with less cost, greater yield per input, etc.). This should be, with our other slogans, a basic criteria for evaluation and design of projects.

The Constraint Matrix

On a suggestion of Bob Berg, PPC/E, a concept of a constraint matrix has been proposed. This matrix would place the major constraint to achieving growth with equity oriented objectives on one side and the present ongoing development activities by USAID and other donors that address these constraints on the other. If this could be achieved such a matrix would be extremely useful in determining the future sectoral direction the USAID program should take.

In attempting to carry out this analysis, it was found, however, that this could not be done.

A number of questions arose in developing the matrix. The most obvious was how does one determine what the major constraints are.

There exist different kinds, different levels of "constraints". For example, under the heading "Basic Constraints", this year's CDSS lists the following: deteriorating resource base (Peanut Basin); depleted energy resources (firewood); diminished land resources and inadequate health and nutrition, including overpopulation. These problems probably have high priority but they are not really "constraints" in the sense of actually blocking Senegalese economic growth or preventing the Senegalese economy from achieving something called "viability".

A more conventional listing of "constraints" would be the following: lack of budgetary resources; climatic factors; and lack of technically skilled people. One problem with these kinds of lists is that priorities remain unspecified. It would in fact be hard to get agreement among different observers as to what constraints are truly "binding". Moreover, the constraints lists or matrices are either so general or - if specific - so long, that any aid program can find a place. This again is not very useful.

Further, constraints can be conceived of as obstacles to the achievement of a pre-determined objective. Thus, an analysis of development objectives must be undertaken before determining how to derive the constraints.

Development objectives such as increased rural income, greater food production, etc. are linked together by a development strategy toward some ultimate goal, such as growth with equity. The linkage or interrelationship among objectives is this strategy. Thus a development strategy needs to be established to determine objectives from which constraints can be derived. But whose development strategy? Ours, theirs

or someone elses? What does one do when there are conflicts in objectives? For example, higher education is not really a sectoral priority, i.e., not a major constraint". But reform or adaptation of the educational system would certainly have to rank high on anybody's list. This means that the (Canadian) Polytechnic school is OK by one criterion, but not by the other.

Finally, even if an agreed upon list of constraints could be established, a problem remains in determining the development activity related to these identified constraints. First, one needs to find out what development activities are actually going on. The Ministry of Plan and other documents such as UNDP and CILSS reports on donor assistance are helpful with this. Second, some development activities are directed toward a number of constraints. It is very difficult to determine what these activities do to resolve each constraint. Finally, an evaluation of the effectiveness of the development activities related to each constraint is required and is virtually impossible to achieve. Faced with these problems it was impossible to fully develop the concept of a constraints' matrix.

1.2.5

convient de noter qu'au cours des trois dernières années, la part des bovins, des ovins-caprins, des porcins et des volailles dans la production nationale de viande et les abats était respectivement de 64 pour cent, 14,5 pour cent, 9 pour cent et 13 pour cent.

Au cours des dernières années, le sous-secteur national de l'élevage a satisfait près de 90 pour cent des besoins nationaux en viandes, à l'exception de l'année 1976, au cours de laquelle les importations concernent en réalité essentiellement des ongulés originaires de Mauritanie et du Mali: l'évolution de ces importations, leur équivalent en viandes et abats sont présentés au tableau 2.

L'addition des quantités de viande importées par le port de Dakar au cours de la même période donne les estimations suivantes concernant la consommation totale.

En utilisant les estimations pour l'année 1977 du cinquième plan de développement économique et social, les calculs peuvent donner une consommation de viande par tête d'habitant de 12,2 kg pour cette année.

B. La stratification en tant que stratégie nationale de développement de l'élevage

Le principe de base essentiel du concept de la stratification est fondé sur l'existence de diverses zones écologiques liant la production animale aux zones de consommation. Il n'est point nécessaire d'explicitier le principe notoire de la spécialisation en matière de naissage, de réélevage et de embouche. Toutefois, il convient d'éviter le danger qui consiste à établir un parallèle entre les activités liées aux conditions écologiques naturelles et l'utilisation maximale des possibilités économiques. Les activités de la SODESP constituent à ce jour l'expérience la plus importante en matière de stratification et peuvent être utilisées à titre d'illustration.

Aux termes du document du projet financé par le FED (5), la SODESP devait acheter aux éleveurs du bétail comportant cinq catégories d'âge et de sexe : des veaux sevrés, des taurillons de 1 à 2 ans, des taurillons de 2 à 3 ans, de jeunes bovins de plus de trois ans et des vaches de réforme. Les 84 pour cent des animaux achetés par la SODESP étaient des veaux âgés d'un peu moins d'un an (6). Ainsi, la plupart des animaux sont d'abord élevés pendant près de deux ans au ranch de Doli et enfin au parc d'embouche de Keur Massar, avant l'abattage. Le rapport préparé par D. Stryker dans le cadre de l'étude sur les dépenses ordinaires du Sahel constitue apparemment la dernière évaluation économique des opérations de la SODESP. Le surpâturage enregistré dans les zones de forages a donné lieu à des

difficultés techniques, on estime que le nombre d'animaux dans cette zone dépasse d'environ 60% le taux de la charge optimale du terrain et est plus important eu égard aux dépenses prévues pour la production fourragère.

Compte tenu des dépenses ordinaires et des bénéfiques à long terme, on s'aperçoit que les problèmes financiers se situent au niveau des activités trop peu rentables de la direction de la SODESP (déficit annuel : 58 millions F.CFA ; seules les dépenses variables enregistrent une reprise dans la zone de naissage ; déficit annuel 487 millions F.CFA). Toutefois, les activités de réélevage et d'embouche ont accusé un excédent de 463 millions F.CFA, ce qui établit un déficit annuel de 82 millions de F.CFA pour toutes les opérations de la SODESP.

Une analyse économique plutôt que financière devrait tenir compte des coûts occasionnés par le surpâturage et des divers bénéfiques directs et indirects des éleveurs. Le déficit enregistré au niveau de la direction peut, être considéré comme une perte économique dans la mesure où une réorganisation, une meilleure administration et une meilleure gestion se traduiraient par une réduction des pertes. En d'autres termes, le même volume de travail pourrait être effectué et les ressources gérées par une autre partie du système économique. Les pertes financières encourues au cours de la phase de réélevage sont essentiellement dues à deux faits :

1. Les prix de vente des veaux d'un an perçus par les éleveurs sont économiquement plus avantageux que ceux des taureaux ou jeunes bovins actuellement commercialisés au bout de trois ou quatre ans.

2. Les éleveurs ne doivent payer que les coûts variables des services de vulgarisation et du fonctionnement du programme, les dépenses fixes étant prises en charge par la SODESP.

On sait que dans des conditions normales, les éleveurs ne vendent pas les veaux d'un an. Le faire signifierait renoncer à la valeur du poids de l'animal à l'âge normal de commercialisation, c'est-à-dire à 4 ou 5 ans. En outre, l'éleveur sait bien que le processus d'inflation augmente le prix des animaux restés dans le cheptel ; mais il est également conscient du fait que ceux-ci peuvent mourir avant l'âge normal de commercialisation. Tout ceci vient s'ajouter au fait que l'éleveur ne vendra aujourd'hui son veau d'un an que s'il pense qu'on lui proposera un prix égal ou supérieur à la valeur d'un jeune bovin de quatre ans au bout de trois ans. On trouvera dans la partie annexe une estimation des opérations d'escompte. Qu'il suffise de dire que la SODESP semble payer actuellement beaucoup plus qu'il ne faut pour inciter les éleveurs à vendre les jeunes bovins d'un an plutôt que ceux âgés de 4 ou 5 ans.

De surcroît, le fait que les éleveurs ne contribuent pas à l'amortissement des dépenses fixes peut bien se traduire par des pertes financières, mais il s'agit ici de transferts plutôt que de dépenses réelles dans le système économique. Ainsi, la seule décision est du ressort de l'appareil politique. En revanche, le gain financier réalisé au cours des phases de réélevage et d'embouche n'est certainement pas égal à la valeur monétaire du gain ajouté net réalisé pour chaque animal par la SODESP par rapport au secteur traditionnel. Ceci constitue une meilleure façon d'évaluer les avantages du système économique.

La réorganisation actuelle des structures de la SODESP semble porter sur deux volets :

1. La réorganisation de la direction et des autres activités administratives en vue d'une efficacité accrue. Ceci impliquerait le renforcement du caractère privé de la société, la réorganisation du système d'utilisation des véhicules, etc...

2. La participation croissante des agriculteurs vivant dans les régions limitrophes du bassin arachidier et celles situées à l'intérieur à l'exécution du volet réélevage. Cette initiative est dictée par l'instabilité des prix des aliments du bétail, l'incertitude de leur disponibilité à court et moyen termes, et par les débouchés limités de la viande de bonne qualité. En vérité, ces deux arguments ont tendance à justifier le recours à un type de réélevage plus "intensif" que celui qui est actuellement pratiqué.

S'il est bien exécuté, le premier volet ne peut donner que des résultats bénéfiques. S'agissant du second volet, à savoir le réélevage extensif dans l'exploitation agricole, il comporte de sérieux problèmes. Bien que les agriculteurs se lancent souvent avec succès dans "l'embouche paysanne", il n'en demeure pas moins qu'il est peu probable qu'ils puissent concevoir l'idée d'élever de jeunes animaux pendant deux ans autour de l'exploitation agricole. La raison principale est que "l'embouche paysanne" est en général une activité de saison sèche (5 à 6 mois). Toutefois, le réélevage dans l'exploitation agricole serait exposé à des problèmes de main d'oeuvre déjà aigus au moment des semailles, du désherbage et des récoltes. En outre, l'argument selon lequel ces animaux pourraient être utilisés pour la traction bovine ne pourrait être invoqué car il s'agirait de bêtes âgées d'un à trois ans. Finalement, même si on peut, d'une manière ou d'une autre, convaincre les paysans à élever ces animaux dans leur champ pendant deux ans, les moyens d'encadrement et de crédit que la SODESP devrait déployer à cet effet seraient énormes et très coûteux (en termes de ressources réelles).

On espère qu'une étude économique complète portant sur les opérations de la SODESP et non pas une analyse financière sera réalisée dans un proche avenir pour résoudre les différents problèmes évoqués ci-dessus. Compte tenu des informations actuellement disponibles et des obstacles qui se posent au réélevage extensif, l'expérience de la SODESP ne peut être considérée comme une réussite nette tant du point de vue financier qu'économique. Il semble que cette position ait eu un profond retentissement au niveau de la mission de l'USAID, mais à mon avis, elle vaut la peine d'être examinée pour des raisons personnelles.

En tout état de cause, cela ne signifie pas que cette théorie de la stratification est tout à fait dépassée. En réalité, il est possible d'envisager plusieurs approches à ce même concept en fonction de la localisation et de l'étendue des diverses phases qui s'y rapportent. L'expérience de la SODESP devrait nous inciter à être prudents quant aux projets d'élevage en différentes phases nécessitant des capitaux importants et des volets de dépenses fixes. Ainsi, deux options restent essentiellement offertes : démarrer avec des animaux élevés dans le secteur traditionnel jusqu'à l'âge de 3 ans et demi ou 4 et en même temps, compter sur la réussite de l'opération avant le moment de l'achat ou de la revente. La première option consisterait à compter sur l'embouche semi-intensive saisonnière. Cette approche adoptée lors d'une expérience au CRA de Bambey, a démontré que le poids des taureaux de trois à quatre ans nourris quotidiennement avec 4 kg de paille d'arachide et 2 kg de tourteaux de sorgho s'accroissait de 23 pour cent (IEMVT). La seconde approche consisterait à encourager les agriculteurs et ceux qui pratiquent également l'élevage à appliquer les mêmes méthodes au niveau de l'exploitation agricole en utilisant les aliments locaux et les produits dérivés pendant la saison sèche.

Il est évident qu'en dépit de ses effets bénéfiques en termes d'approvisionnement en viandes, l'embouche n'est réellement rentable que pendant cinq ou six mois de l'année ; par conséquent, cette activité ne devra pas constituer le support d'une infrastructure importante, qu'il s'agisse de l'encadrement du crédit ou de la commercialisation. Toutefois, je crois qu'il convient d'examiner attentivement l'expérience découlant de plusieurs essais effectués au Sénégal et dans d'autres pays africains (par exemple, IEMVT), ainsi que la possibilité d'étendre l'embouche paysanne telle qu'elle est actuellement pratiquée. Le problème du sous-secteur de l'élevage sénégalais ne s'en trouvera pas ainsi complètement résolu, mais ceci contribuera pendant longtemps à une production accrue de viande.

C. L'élevage traditionnel et le système de commercialisation de la viande (7)

On s'accorde largement à reconnaître que les stratégies de développement du secteur primaire doivent satisfaire certaines conditions essentielles donnant libre cours à l'incitation à la production. D'une manière générale, il s'agit :

1. De prix aux producteurs raisonnablement stables et rémunérateurs ;
2. d'un système adéquat de commercialisation ;
3. d'un système satisfaisant de fermage (voir Abbott, 1967).

Ces préceptes simples s'appliquent naturellement au sous-secteur de l'élevage sénégalais et au modèle de stratification, car la structure de base économique, l'avantage régional relatif de certaines activités, dépendent de l'efficacité des échanges entre les régions. Il est surprenant que l'accent n'ait pas été mis sur la commercialisation dans l'orientation générale du sous-secteur, ainsi que dans celle des projets spécifiques, notamment celui de l'USAID à Bakel et ceux financés par la Banque Mondiale au Sénégal Oriental. Mieux encore, on apprend ou on a l'impression que pour le Gouvernement, le système doit être "contrôlé" et "rationnalisé", tandis que les projets de l'AID et de la BIRD ont été conçus en supposant qu'on pouvait compter sur le système traditionnel ou le modifier de manière à le rendre apte à contrôler les extrants des projets. L'une des raisons de cette différence fondamentale d'approche est que le GS a tendance à considérer à la fois l'élevage et la commercialisation de la viande, tandis que les projets spécifiques étaient plus concentrés sur le volet élevage. Ceci constitue une différence fondamentale.

L'étendue et l'intensité de toute activité de collecte d'information au lieu de la recherche,.....ne permettent ni de faire des conclusions générales ni de généraliser ; néanmoins plusieurs points méritent sans doute d'être évoqués. Le premier point concerne les informations "absolues" recueillies sur la performance de la commercialisation dans la zone ; le second point d'intérêt porte sur la profonde compréhension que quelques agents travaillant sur le terrain ont du fonctionnement du système et le troisième est relatif à l'ignorance qui caractérise des personnes dont le rôle et la position devraient être sous-tendus par une connaissance beaucoup plus grande du système de commercialisation du bétail.

1. Organisation du système de commercialisation du bétail dans le département de Tambacounda

Tambacounda constitue, par excellence, le principal marché de la région du Sénégal Oriental. Il est incontestablement le centre de rassemblement des animaux achetés dans la région..... directement aux éleveurs ou, dans une moindre mesure, dans les très petits marchés secondaires de la région. Les animaux qu'on trouve généralement dans le parc à bestiaux de Tambacounda sont originaires du nord-est, Bakel et Kidira, et du sud-est, département de Kédougou, et de l'Ouest, des confins de la région du Sine-Saloum. On y trouve également des animaux originaires de la Mauritanie et du Mali.

D'abord, la chaîne de commercialisation doit procéder à ce qu'on appelle parfois la "collecte". Elle consiste essentiellement en l'achat auprès des éleveurs au niveau des villages et en l'acheminement des animaux au marché. Bien qu'il soit rapporté que quelques bouchers se rendent dans des villages pour acheter du bétail aux éleveurs, la plupart du commerce est en réalité effectuée par les Dioulas. La plupart des ouvrages concernant le sous-secteur de l'élevage au Sénégal peignent le Dioula en tant que profiteur, et son rôle réel est apparemment très simplifié. On dit fréquemment qu'il jouit d'une position monopsonistique, qu'il n'informe pas les propriétaires de bétail de la valeur et des coûts réels, que ses clients établis lui proposent des prix préférentiels, etc...

Ce modèle simple ne résiste pas à l'étude critique, dans le cas du département de Tambacounda. En réalité, les agents locaux du service de l'élevage qui ont passé plusieurs années dans la région ne lui accordent aucun crédit. Leurs objections à ce modèle du "tout puissant Dioula", qui nous ont été librement rapportées, sont fondées sur le fait suivant :

- L'utilisation du terme "Dioula" est très simplifiée. Au cours de nos entretiens.....avec les agents du Service de l'élevage, nous avons pu identifier trois types d'opérations économiques entrant dans la catégorie générale du "Dioula" ;

a) personnes achetant du bétail pour le compte d'un commerçant établi à Tamba, avec une avance octroyée par le même marchand ;

b) petits opérateurs indépendants achetant du bétail avec leur propre argent pour le revendre au principal marché régional ;

c) grands opérateurs indépendants qui organisent la vente du bétail à Tambacounda et le convoyage par train ou camoin à destination d'un marché terminal (exemple : l'agglomération dakaroise).

1.2.11

Le Dioula n'a aucun pouvoir monopsonistique ; une part significative des ventes intervient au niveau des villages sans sa participation. Il s'agit, entre autres, des transactions entre villageois et des ventes moins fréquentes aux bouchers. Bien qu'aucune donnée ne soit disponible à ce sujet en ce qui concerne le département de Tambacounda, je suis très tenté d'adopter leur point de vue pour deux raisons, à savoir que :

a) les villageois de la zone de Toulekedé et ceux de Sarré ont indiqué que des transactions de bétail avaient eu lieu dans des villages, b) l'étude la plus détaillée qui soit disponible sur les transactions de bétail en zone sylvo-pastorale (IEMVT, 1974) a indiqué que les Dioulas ne participaient pas à environ 30 pour cent des ventes.

Les informations relatives à la disponibilité et aux conditions du bétail de diverses zones circulent librement et rapidement entre les Dioulas opérant à partir de Tambacounda. Ceci bat en brèche l'idée selon laquelle les éleveurs continuent à vendre régulièrement au même Dioula. En outre, les habitants de la zone ne se font pas le moindre scrupule de participer à l'économie monétisée ; beaucoup d'éleveurs qui ont cette possibilité deviennent eux-mêmes des Dioulas.

Les Dioulas paient comptant le prix intégral de l'animal qu'ils achètent. Ceci est vrai pour toute la région, y compris la zone de Sarré concernée par le projet. La zone de Toulekedé constitue la seule exception à cause de son isolement et de sa participation limitée à l'économie régionale monétisée. Cependant, la situation est déjà entraîné de changer, surtout après l'achat de bêtes à Baniou, par les responsables du projet de l'AID. Je suis persuadé que dans quelques mois, les Dioulas devront adopter les mêmes modalités de paiement dans leur transactions avec les éleveurs de la zone de Toulekedé qu'avec les autres de la région.

D'une manière générale, on conclura que le système de collecte fonctionne bien dans l'ensemble du Sénégal Oriental, y compris la zone de Sarré. Au cas où il n'existe aucune entrave, le système de collecte traditionnel de la zone de Toulekedé fonctionnera bientôt aussi efficacement. Les activités inscrites dans le cadre du projet de l'AID devraient, à ce titre, favoriser la concurrence au niveau des acheteurs. L'idée d'offrir aux éleveurs des prix plus élevés que ceux susceptibles d'être concurrencés par les Dioulas dans les meilleures conditions, sera à long terme très préjudiciable tant du point de vue financier qu'économique. Ce problème sera de nouveau abordé lorsque les activités spécifiques du projet seront examinées.

La deuxième partie de la collecte des informations sur la commercialisation du bétail a eu lieu au parc à bestiaux de Tambacounda. A cet effet, nous nous sommes entretenus avec les

agents du service de l'élevage, les Téfankés locaux, les Dioulas et les bouchers (la plupart du temps en français). Comme cela a été précédemment le cas avec le terme "Dioula", nous avons trouvé que le mot "Téfanké" s'appliquait à plusieurs opérateurs économiques ayant des rôles spécialisés et distincts.

Au sens propre, le terme "Téfanké" désigne une seule personne dans chaque marché de bétail. C'est l'équivalent du mot haoussa "Dillali", qui signifie celui qui sert d'intermédiaire entre les acheteurs et les vendeurs. A ce titre, il recueille, utilise et diffuse les informations relatives au marché dont il est l'unique "source". Ces informations concernent essentiellement la connaissance des conditions de l'offre et de la demande et le taux d'endettement des bouchers. Il s'entretient également avec les agents du service de l'élevage et les autres groupes privés ou publics, en tant que représentant de divers groupes opérant sur le marché. Le plus souvent, il est également marchand de bétail bien établi. L'acheteur lui verse 500 F.CFA pour chaque tête de bétail vendu au parc à bestiaux.

Le Téfanké est assisté de plusieurs opérateurs de marché souvent également appelés téfankés, mais qui peuvent aussi porter le nom de "courriers". En général, ils assistent le Téfanké dans ses tâches et gagnent leur vie dans le commerce du bétail, aidés par un "collecteur" engagé ou Dioula, ou en spéculant à court terme sur la valeur du bétail qu'ils gardent pendant quelques jours ou, tout au plus, quelques semaines.

Au parc à bestiaux de Tambacounda, les prix du kilo sur pied (fin Mars 1980) étaient de 120 à 130 F.CFA. Ces prix étaient proposés à l'acheteur par l'opérateur de marché et le poids déterminé par deux agents du service d'élevage. Une étude suivie sur le poids des carcasses à l'abattoir était effectuée de temps à autre.

Les estimations des fonds de roulement des bouchers de Tambacounda ont été fournies par les agents du service de l'élevage et les bouchers du parc à bestiaux :

- Taxe à l'abattage : 500 F.CFA/tête
- Location de l'étal : 1500 F.CFA/mois
- Taxe municipale quotidienne : 100 F.CFA/jour
- Licence : 12.000 F.CFA/an

L'abattage est effectué par un apprenti boucher. Celui-ci reçoit sa "part coutumière" au lieu d'un paiement "déchets d'abattage, tête, partie de la queue). La viande de boeuf désossée est actuellement vendue à 400 F.CFA/kg (prix du marché libre).

Le transport de toutes les bêtes hors du marché de Tambacounda est effectué par camion, la destination étant le Cap-Vert. Le coût du convoyage par camion est de 200 F.CFA/tête, tarif très raisonnable, eu égard à la distance et aux tarifs en vigueur dans les autres pays d'Afrique de l'Ouest.

Comme il a été déjà noté, ces informations sus-mentionnées ne peuvent s'appliquer à l'ensemble du sous-secteur de l'élevage. Cependant, elles mettent à jour des données utiles pour la zone du projet et montrent qu'à certains niveaux, il n'est pas si difficile de connaître les aspects détaillés et de comprendre le système.

Au cours d'une longue discussion que nous avons eue avec un haut responsable à Dakar sur le système de commercialisation au Sénégal Oriental, il a été indiqué que le bétail était toujours convoyé de Tambacounda à Bakel et finalement acheminé à Dakar. Comme nous le savons maintenant, ceci n'est plus vrai depuis deux ans. Ce manque d'information constitue peut être une exception plutôt qu'une règle chez les agents sénégalais. Par contre, si ce phénomène est aussi répandu que j'en ai maintenant le soupçon,.....après tout, tel est le cas dans plusieurs autres pays.....nous nous trouvons alors face à une situation inquiétante. Comment peut on en réalité s'attendre à ce que les sociétés publiques jugent, concurrencent ou dépassent un système complexe qu'elles semblent peu comprendre ?

Il ressort également de la courte enquête sur le système de commercialisation de Tambacounda qu'il existait une importante lacune dans la compréhension générale de la chaîne de commercialisation ; je fais allusion ici à la commercialisation de la viande. Par exemple, un boucher qui achète un animal au parc de Tambacounda à 240 ou 250 F.CFA le kilo carcasse, vend sur le marché le kilo de viande à 400 F.CFA. Compte tenu des fonds de roulement indiqués ci-dessus, on est tenté de conclure que les bouchers sont inefficaces ou qu'ils réalisent des profits excessifs. De même, avec des coûts de transport des animaux, aussi bas que 15 F.CFA le kilo entre tambacounda et Dakar, les prix de la viande sur les marchés libres de la capitale sont encore plus difficiles à accepter sans rien dire. Mais me référant à une expérience antérieure, je me garde de conclure hâtivement que les profits sont excessifs. Il s'avère nécessaire d'obtenir des données de base sur les dépenses et les recettes. Celles-ci seraient utiles pour la planification de ce sous-secteur et permettraient au GS et aux donateurs étrangers de mieux appréhender les effets découlant du projet.

2. Evolution du cheptel dans le département de Bakel

Seuls quelques paramètres sont disponibles concernant la récente évolution du cheptel dans le département de Bakel qui comprend les arrondissements de Ololdou (zone du projet), Goudiry, Balla et Bellé.

TABLEAU 4

EFFECTIFS DU BETAIL DU DEPARTEMENT DE BAKEL, 1974-1979

(Nombre de têtes)

<u>Année</u>	<u>Bovins</u>	<u>Ovins et Caprins</u>	<u>Volailles</u>
1974	142.000	153.000	170.000
1975	150.000	-	-
1976	130.000	154.000	203.000
1977	160.000	174.000	235.000
1978	177.000	233.500	411.200
1979	198.000	317.000*	717.000

* 40% : Ovins, 60% Caprins

Sources : 1974 et 1976 : John Ericksen, Livestock Sector Analysis for Senegal, April 1978.1977-1979 ; Service de l'Elevage ; Rapport Annuel, 1979 ; Bakel.

Les données de base concernant les abattages locaux semblent être plus révélatrices ; la consommation locale de bovins a accusé un net recul au milieu des années 70 ; le chiffre de 1979 étant encore inférieur au nombre d'abattages de bovins en 1974. Toutefois, la consommation d'ovins et de caprins n'a pas connu des fluctuations aussi marquées.

1.2.15

TABLEAU 5

ABATTAGES CONTROLES DANS LE DEPARTEMENT DE BAKEL :

1973-1979 (Nombre de têtes)

<u>Année</u>	<u>Bovins</u>	<u>Ovins-Caprins</u>
1973	3.263	3.123
1974	1.816	2.883
1975	616	4.044
1976	835	3.404
1977	1.328	3.043
1978	1.777	3.144
1979	1.357	5.201

Poids carcasse moyens : 120 Kg (Bovins)
10 Kg (Ovins-Caprins)

Composition des abattages de bovins - 1979

Taureaux et jeunes bovins : 71%
Vaches : 17%
Veaux et velles : 12%

Sources : John Ericksen ; Op.cit. ; Avril 1978 ;
Service de l'Elevage, Bakel, op. cit. 1980

Autre facteur intéressant ayant influencé la consommation de viande dans les centres urbains, le poisson congelé, séché ou fumé envoyé de la côte de l'Atlantique.

TABLEAU 6

VENTES DE POISSONS DANS LE DEPARTEMENT DE BAKEL,
1978-1979 (Tonnage)

	<u>1978</u>	<u>1979</u>
Poisson congelé	43,4	98,4
Poisson séché ou fumé	6,15	23,6

Note : origines : Dakar, Kayar, M'Bour, Saint-Louis et Joal.

Source : Service de l'Elevage, Bakel 1980

Dans son ouvrage intitulé : Livestock Sector Analysis for Senegal, (Erickson, 1978), l'auteur indique que la consommation locale de viandes et abats dans le département de Tambacounda avait accusé un recul marqué depuis le début des années 70.

Il indique également que les consommateurs s'étaient partiellement adaptés aux nouvelles conditions du marché en accroissant leur consommation de poissons. Ces informations corroborent les récentes données disponibles concernant le département de Bakel (voir Tableaux 4 à 6). Selon une étude de la FAO (FAO, 1961) 1,7 kg de poisson frais ou congelé équivaut en protéines à 1 kg de viande de boeuf. Par contre, 1 kg de poisson séché ou fumé (connu au Sénégal sous le nom de Ketiakh et Guedj) équivaut à 3 kg de poisson frais (Lagoïn et Salmon, 1967). La consommation 1979 peut donc être exprimée comme suit :

Viandes :	267,5 tonnes	(73%)
Poissons :	100,5 tonnes	(27%)
TOTAL :		100%

Les prix pratiqués sur le marché de Bakel en Mars 1980 étaient les suivants :

Viande de boeuf avec os :	250 F.CFA/kg
Viande de boeuf désossée :	400 F.CFA/kg
Poisson :	300 F.CFA/kg

Les données précédentes ne concernent pas directement le problème de la stratification, mais sont évoquées ici dans la mesure où elles peuvent entrer dans le cadre de la politique nationale d'élevage. Les caprins-ovins et les volailles contribuent actuellement pour 14 et 12 pour cent respectivement à la production de viandes. Compte tenu de la situation prévalant dans d'autres pays d'Afrique de l'Ouest, il est possible d'étendre ce projet. Il est très probable que les investissements occasionnés par ces espèces soient plus rentables en termes de disponibilité de viandes et de revenus que dans le cas des bovins.

Valorisation d'un jeune bovin par rapport au veau sevré

Cette partie a pour objet d'étudier les conditions dans lesquelles les éleveurs sont disposés à vendre les veaux d'un an plutôt que de les élever jusqu'à l'âge de la maturité pour les commercialiser. Le procédé économique par lequel un éleveur accepte de vendre un veau d'un an au lieu d'attendre trois ou quatre ans plus tard consiste entre autres, en une estimation des gains de poids et de prix par tête et prend en considération les risques de mortalité naturelle de l'animal entre temps. En d'autres termes, un éleveur ne vendra un veau aujourd'hui que

1.2.17

s'il obtient un prix qu'il estime être égal à la valeur escomptée de l'animal au bout de trois ans.

Les calculs simples de ce processus d'escompte tiennent compte des facteurs suivants :

- le poids vif de l'animal d'un an,
- le poids vif prévu de l'animal à l'âge de cinq ans ,
- le taux d'inflation prévu au cours des trois prochaines années,
- et les risques de mortalité au cours de la même période.

Exemple :

- 1) un jeune bovin âgé d'un an en 1980, poids vif 100 kg
- 2) en 1984, le même animal pèserait environ 220 kg (secteur traditionnel)
- 3) le taux d'inflation prévu au cours des quatre prochaines années peut être calculé sur la base de taux moyen national actuel de 12% par an.
- 4) le prix du taureau vivant de cinq ans élevé dans le secteur traditionnel est de 120-130 F.CFA le kilo vif sur le marché;
- 5) d'après l'étude des données de base de la zone sylvo-pastorale (IEMVT, 1974), les taux de mortalité de divers groupes d'âge de veaux étaient :

<u>Age</u>	<u>Mortalité</u>	<u>Facteur de survie (100 M)</u>
0-1	18%	
1-2	8%	92%
2-3	5%	95%
3-4	2%	98%
4-5	2%	98%

Probabilité combinée de la survie entre 1 et 5 ans.
(0,92 X 0,95 X 0,98 X 0,98) :

La valeur future prévue du jeune bovin actuel au bout de 5 ans est donc :

Le prix actuel du jeune bovin de 5 ans X le taux d'inflation pendant 4 ans X la probabilité de survie (= environ 31,000 F.CFA). Le taux d'appréciation de n'importe quel animal d'un troupeau peut être considéré comme étant i) le simple gain de poids entre l'âge d'un an et l'âge de cinq ans, ou ii) une estimation de la productivité du troupeau mesurée au moyen de la valeur monétaire des produits du troupeau X 100 divisée par

1.2.18

la valeur monétaire totale du même troupeau (voir IEMVT, 1974)
Dans tous les cas, on peut utiliser une moyenne représentant
22 pour cent par an.

La valeur actuelle de l'animal susceptible d'être vendu
en 1984 est donc :

V.A. 31.000 11.500 F.CFA, soit 115 F.CFA le kilo vif
(1,22)⁴

d'un veau actuel pesant 100 kg.

1.2.19

NOTES

- 1) Cinquième Plan Quadriennal de Développement Economique et Social, NEA, Dakar, 1977
- 2) IBID
- 3) IBRD Draft Economic Report for Senegal
- 4) IBID
- 5) FED, Avant-Projet, SODESP
- 6) Dr. L. Gueye, Directeur-Général, SODESP, communication personnelle, 29 Mars, 1980.
- 7) Outre les études précédentes, réalisées dans d'autres pays africains, et qui ont permis à l'auteur d'acquérir une expérience utile, les seules connaissances qu'il avait de ce sujet relatif au Sénégal se limitaient aux informations tirées de divers rapports et recueillies lors des entretiens qu'il a eus avec les spécialistes de l'IEMVT à Dakar-Hann, les responsables de la SERAS et les agents du service de l'élevage à Bakel, ainsi que le personnel du projet USAID de Bakel.

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PRODUCTION AGRICOLE INTEGREE - BAKEL

Date de la requête:

Financement requis: 3.997.000\$, 3 ajustements, accord portant sur un montant de 4.834.000\$

Accord signé le 22 Août 1977.

Organisme officiel sénégalais coopérant: Société d'Aménagement et d'Exploitation des Terres du Delta.

Durée du projet: jusqu'en 1981.

Description:

A. OBJECTIF: Production céréalière accrue dans le bassin du fleuve Sénégal afin d'offrir aux Soninkés de la région une possibilité plus attrayante que le travail à l'étranger.

1. Indicateurs objectivement vérifiables (IOV)

a. Accroissement d'ici 1990 de la production céréalière dans le bassin du fleuve de 251 tonnes métriques.

2. Diminution de 50% d'ici 1990 de l'émigration enregistrée dans cette région vers la France.

B. BUT: Introduire l'agriculture irriguée dans le département de Bakel pour initier les agriculteurs aux techniques améliorées et démontrer la factibilité économique et technique de l'agriculture irriguée.

1. Indicateurs objectivement vérifiables

a. Un total de 7.000 personnes travaillant dans des périmètres irrigués d'ici 1980.

b. 900 ha. de terres produisant 2 récoltes annuelles en 1980.

c. Rendement moyen de riz dépassant 3T/ha: ..

C. EXTRANTS: Aménagement d'au moins un périmètre irrigué dans chacun des 23 villages riverains.

Introduction de techniques améliorées, y compris la traction animale pour les cultures sèches dans chacun des villages concernés.

1. Indicateurs objectivement vérifiables.

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- a. 24 groupes de paysans encadrés d'ici 1977.
- b. Aménagement d'ici 1980 de 24 périmètres d'une superficie totale de plus de 1800 ha.
- c. 24 exploitations expérimentales envisagées.

D. INTRANTS:

1. Assistance technique
2. Infrastructure administrative
3. Dépenses administratives
4. Pompes et outils à main
5. Main d'oeuvre villageoise
6. Matériel de traction animale
7. Digues

INTRODUCTION:

Une équipe de trois évaluateurs a effectué une évaluation sur le terrain du projet de production agricole intégrée de Bakel du 28 mars au 21 avril 1980. Elle était composée du Dr. Ronald Curtis, agronome du bureau du développement rural et de l'administration du développement de l'AID; Mr. John Wilson, spécialiste et ingénieur agronome et Mr. Richard Miller, sociologue du bureau de liaison de l'USAID et de l'OMVS à Dakar.

L'équipe a séjourné à Dakar du 28 mars au 4 avril 1980 pour consulter les documents existants et s'entretenir avec les responsables sénégalais et ceux de l'USAID. La période du 4 au 11 avril a été consacrée à une tournée à Bakel au cours de laquelle l'équipe a procédé à l'évaluation du projet et visité la plupart des périmètres et les responsables sénégalais et ceux de l'USAID travaillant dans le cadre du projet. Le rapport de l'équipe a été rédigé du 11 au 21 avril. Les évaluateurs ont eu un entretien avec MR. Coly, Directeur de la SAED, le 18 avril à Saint-Louis. Ils ont également rencontré le groupe d'étudiants de l'ENEA chargé de l'élaboration du questionnaire de l'enquête auprès des bénéficiaires menée dans la zone d'implantation du projet.

Le système des Petits Périmètres

Au fil des années, l'évolution du cadre naturel de la Région du Fleuve a été étroitement liée à l'utilisation saisonnière de l'eau. La préparation des champs pour l'agriculture en terres sèches (Diéri) n'a lieu qu'après que la première pluie ait amolli la terre. La plantation traditionnelle du riz dans les marécages ne commence qu'après la formation de cuvettes remplies d'eau par le ruissellement. Ensuite, vient l'agriculture de décrue (Oualo), après la décrue du fleuve. Au fur et à mesure que s'achève la saison des pluies, on fait paître le bétail sur des pâturages au rendement décroissant, loin du fleuve: les lits des cours d'eau temporaires sont creusés pour l'approvisionnement en eau potable.

S'il ne pleut pas ou s'il ne continue pas à pleuvoir avec la même intensité pendant les trois mois que dure la saison des pluies, les récoltes en terres sèches sont perdues; la décrue du fleuve laisse une plus petite superficie remplie d'eau et de limon pour les cultures de décrue, les marécages se dessèchent avant que le riz ne mûrisse, et devant la rareté des pâturages, le nombre d'animaux incapables de survivre à la pénible sécheresse s'accroît.

Ces systèmes comportent des risques, sont très coûteux et nécessitent un travail intensif. Ils sont en réalité susceptibles de se solder par un échec total, souvent quatre années sur cinq.

Le programme des petits périmètres irrigués de la SAED écarte l'idée du destin intervenant dans l'approvisionnement en eau pour donner la maîtrise de cet élément aux producteurs. Il élargit les options offertes aux villageois en matière de production agricole et réduit considérablement les risques. Le projet réduit substantiellement les risques mesurés en termes de pertes de production en cas d'insuffisance ou de surabondance des pluies. D'où une réduction des fluctuations de la production agricole traditionnelle. Il est également possible d'introduire de nouvelles activités de production plus rémunératrices, lesquelles auraient été impossibles sans un degré avancé de maîtrise de l'eau.

Le système des périmètres irrigués constitue un changement structurel que l'on ne peut provoquer en pratiquant une agriculture en vase clos; on doit le considérer comme une force porteuse de changements économiques et sociaux pour la vie des paysans.

A ce jour, les périmètres irrigués sont exploités pour procurer des revenus supplémentaires, les cultures vivrières étant produites dans le cadre de l'agriculture traditionnelle

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sous-pluies. On indique également que certaines exploitations agricoles sous-pluies sont actuellement incluses dans les périmètres, ainsi que certaines zones marécageuses. Quoiqu'il en soit, les producteurs considèrent cette innovation comme une garantie contre la baisse de la production vivrière et comme une soupape de sécurité contre la réduction de l'offre d'emplois en France.

L'irrigation a été commencée par un groupe de paysans du village de Koughane qui, ayant formé une association de producteurs, avaient demandé à la France de leur fournir des assistants techniques pour les aider à irriguer des zones situées près du fleuve. Un organisme parisien privé fut le premier à leur envoyer des techniciens, mais ceux-ci quittèrent bientôt. En août 1977, l'AID, en réponse à leur demande d'aide, accorda une subvention de 5.859.000\$ pour un projet d'aménagement d'environ 1800 hectares concernant au moins 23 villages dans le département de Bakel. La SERDA, un groupe de consultants sénégalais et la SAED fournirent l'assistance technique. Chaque périmètre est géré par un groupement de producteurs originaires du même village.

La technique d'irrigation au moyen de pompes fait l'objet d'une série d'activités menées par les paysans des périmètres de la SAED.

Depuis le début du projet, les rôles des producteurs et des agents de la SAED se sont accrus, dans le département de Bakel, par suite des pressions qui se sont exercées pour une plus grande autonomie en matière de gestion, de production, de gestion de la dette et de commercialisation par les groupements de producteurs. Les villages participants défrichent d'abord les terres, la SAED fournit les engins. Les villageois fournissent la main-d'oeuvre pour creuser les canaux et niveler le terrain. Ils prennent les décisions concernant la répartition des terres en parcelles communales et individuelles et répartissent les tâches, souvent par tirage au sort. La SAED met à leur disposition un ou plusieurs lots de pompes et débite au compte du groupement les semences, les engrais, le carburant et les pièces de rechange. La SAED apporte également son assistance à la production. Un contrat formel définit les responsabilités et les droits des deux parties. L'une des clauses reconnaît la SAED comme seul établissement agréé de commercialisation du riz à un prix fixe. Bien que la SAED distribue les facteurs de production nécessaires, le contrôle de leur mise en application est réservé au groupement. La récolte et le battage sont effectués par les producteurs. Dans ce cas, la main-d'oeuvre devient également un aspect de la gestion.

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Imitant l'association des producteurs, les groupements ont exploité à titre collectif les premiers périmètres aménagés et réparti la production entre la SAED, pour éponger les dettes du groupement, et les membres pour leur permettre de subvenir à leurs besoins. L'importance des exploitations collectives a diminué depuis le démarrage du projet en 1975, bien que les champs collectifs des périmètres qui avaient été exploités cette année-là couvrent encore 23% des terres. Un petit périmètre ne contient que des exploitations collectives. Quinze périmètres n'en ont pas. Il convient de noter que le contrat de la SAED stipule que les champs collectifs ne doivent pas couvrir une superficie supérieure à 30% des terres de chaque périmètre.

Les groupements assument l'entière responsabilité de la gestion de leurs périmètres; ils se consultent pour prendre des décisions relatives à la répartition des terres et l'approvisionnement en eau, aux modalités de gestion du crédit et des dettes perçues, aux règlements des conflits, et à la main-d'oeuvre.

Les producteurs peuvent faire trois récoltes annuelles à condition que l'eau soit suffisante, que le volume des crédits ou leur situation financière soit à même de leur permettre d'obtenir les facteurs de production et la main-d'oeuvre nécessaires. Lors de la campagne agricole 1979-80, les producteurs du département de Bakel ont exploité 226 hectares de riz et 80 hectares de maïs pendant la saison des pluies. Pendant la saison sèche et fraîche, 202 hectares de maïs et presque six hectares de légumes ont été cultivés, contre 46 hectares pendant la saison sèche et chaude. Bien que des hectares puissent être exploités avec des rendements beaucoup plus élevés, tel n'a pas été le cas pour un certain nombre de raisons décrites ci-dessous.

Principales conclusions et Recommandations

D'une manière générale, les principales conclusions de cette évaluation appuient l'idée d'un système de petits périmètres irrigués.

Les conclusions sont axées sur les systèmes d'irrigation actuellement utilisés. Ceci implique que la SAED, les agriculteurs et l'USAID doivent entreprendre un certain nombre d'activités pour atteindre un niveau de productivité optimale dans les terres irriguées.

CONCLUSIONS:

1. En principe, l'idée du projet de Bakel est bien fondée. Ce projet concerne la maîtrise de l'eau, dont l'absence a entravé l'amélioration de la qualité de vie des populations de la zone et réduit la production agricole.

2. Le rôle de fournisseur de facteurs de production et d'assistance technique que joue la SAED est nécessaire à ce stade d'élaboration du projet; la politique arrêtée par la SAED et consistant à élargir la responsabilité de gestion des participants au fur et à mesure que se développent les institutions privées est soutenue. Cette politique reconnaît que la réussite finale du projet dépendra de la capacité des groupements de gérer les ressources que représentent les périmètres irrigués.

3. Le nombre relativement faible d'hectares irrigués actuellement ne doit pas être interprété comme un échec. Ceci indique l'existence de graves problèmes dans la mise en oeuvre du projet. Toutefois, la SAED et les villages participants ont été confrontés au cours des dernières années à des difficultés dans leurs efforts d'introduction de cultures irriguées dans cette zone. Un nombre suffisant de villages semblent être persuadés que le nouveau système est avantageux. Le projet doit à présent s'appuyer sur ce soutien pour continuer.

4. La mauvaise qualité des études topographiques, la pauvreté du sol et les mauvaises études de factibilité ont constitué un sérieux handicap pour le projet.

Une carte préparée en 1977 sur la végétation naturelle et la production annuelle s'est avérée être à peine convenable pour l'irrigation. L'efficacité de la maîtrise de l'eau dépend directement des normes de qualité maintenues au cours de l'élaboration des informations et leur transmission aux responsables du projet.

5. Il convient de reconnaître le caractère expérimental du projet. En conséquence, l'état d'avancement doit être délibérément mesuré tout en étudiant les inconnues relatives aux domaines de l'ingénierie, de l'agronomie, à l'aspect économique, à l'organisation et en assurant la formation du personnel. Une attention immédiate portée sur la sélection des variétés, les pratiques culturales et une plus grande efficacité de la distribution d'eau serait particulièrement importante à ce stade. Les bénéfices du projet ne résulteront pas des quelques hectares irrigués pendant la durée du projet, mais plutôt de la transposition dans d'autres régions d'un système perfectionné de cultures irriguées dans les années à venir. Le système actuellement utilisé à Bakel, coûteux et à faibles rendements, comporte une marge insuffisante d'erreurs et risque d'être rejeté par les producteurs à moins de le rendre plus efficace. La crise financière et celle de la crédibilité auront lieu lorsque les premiers groupes de pompes devront être remplacés.

6. Les besoins en matière de formation doivent faire l'objet d'une plus grande attention; des ressources accrues

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doivent leur être consacrées. A ce stade, deux aspects sont particulièrement importants. Premièrement, des pompistes doivent être formés au niveau du village pour assurer l'entretien et la réparation du matériel dont ils sont chargés. Deuxièmement, les compétences techniques de la SAED doivent être relevées. Les ressources actuellement consacrées à la formation sont d'une insuffisance désolante. A cet égard, il est recommandé l'octroi de dix bourses d'études. Quelque soit le nombre arrêté, la formation doit être vue comme une construction pour l'avenir et il ne faut pas la limiter à la durée du projet. En outre, on devrait faire venir une équipe composée d'un ingénieur, d'un expert en cultures irriguées, et d'un agronome pour former sur place les présidents des groupements et les gestionnaires du système hydraulique aux techniques de maîtrise de l'eau.

7. La durée du projet devrait être prolongée de trois autres années, jusqu'à 1984. Le personnel de la Mission de l'USAID doit jouer un rôle plus actif en tant que partenaire à part entière participant à l'exécution du projet par opposition à son rôle actuel d'agence commerciale.

L'objectif visé par le projet, à savoir la mise en valeur de 1800 hectares de terres, n'a pas encore été atteint. Toutefois, bien que la production dans les périmètres existants ait connu une amélioration, elle n'est pas encore optimiste en raison du nombre insuffisant d'études techniques et des erreurs qui ont découlé de la conception et l'aménagement des périmètres. En outre, les techniques à appliquer pour les différentes cultures n'ont pas été bien élaborées et toutes celles qui sont disponibles ne pourront être disséminées par le biais de la vulgarisation. Les systèmes de registres destinés à contrôler la production et les facteurs de production ne sont pas mis en place au niveau des exploitations agricoles pour fournir des données sur la gestion et permettre aux agriculteurs ou aux assistants techniques de prendre les décisions nécessaires.

Bien qu'il soit reconnu que les changements de méthodes culturales de diéri et de oualo nécessitent une longue période de préparation, il n'y a pas de données concrètes sur la situation financière du producteur ou son aptitude à continuer l'agriculture irriguée sans l'octroi de subventions directes ou indirectes.

L'évaluation conclut que la superficie en hectares et la productivité déficitaires sont essentiellement imputables aux agences chargées de la mise en oeuvre qui n'ont pas fourni l'assistance technique et les matériaux suffisants en temps opportuns.

Pour remédier à ce problème, on pourrait mettre l'accent sur l'accroissement de l'assistance institutionnelle à la SAED, établissement qui, en dernier lieu, est chargé d'assurer la formation, d'aider à aménager les périmètres, de fournir les facteurs de production et d'assister les agriculteurs dans le domaine de la commercialisation. Toutefois, force est de constater l'évidence selon laquelle d'autres groupements privés bénéficient potentiellement de l'assistance apportée dans le cadre du projet. D'après les recommandations énoncées ci-dessous, ceci exigera une formation accrue pour les agents de la SAED, une meilleure organisation dans la mise en oeuvre et de meilleures données à l'appui des décisions afférant au programme. Pour ce faire, les rapports existant entre la SAED et l'USAID dans le cadre de la gestion doivent être améliorés pour faciliter l'exécution des termes du protocole d'accord initial.

Entre temps, étant donné que la SAED est en mesure d'assurer la gestion, le taux d'expansion de nouveaux petits périmètres doit faire l'objet de restrictions.

1ère Recommandation - Générale

L'expansion rapide de la superficie des terres irriguées doit être freinée jusqu'à ce que cette technologie pleine de promesses soit améliorée pour une utilisation dans les régions du Sénégal où l'eau est rare. Avec l'appui actif des groupements participant actuellement au processus, on doit entreprendre une recherche appliquée sur les problèmes de génie civil, les aspects agronomiques, économiques et l'organisation. Tout en évitant la réduction de la superficie des terres déjà cultivées, et en permettant l'extension dans certains cas, les groupements doivent être utilisés à titre expérimental pour améliorer la technologie avant que les erreurs n'augmentent les coûts au point de rendre cette technologie peu lucrative pour les agriculteurs et non économique pour l'Etat. Ainsi, le projet doit servir de cadre de recherche appliquée avant son extension rapide dans la zone concernée et dans d'autres régions riveraines du fleuve.

2ème Recommandation - Agronomie

Fournir une assistance au service national de la recherche pour l'aider à se pencher sur les problèmes des zones arides et de celles où sont pratiquées des cultures sous pluies.

Aider les agriculteurs en accroissant les moyens de lutte contre les parasites.

Financer la recherche sur la consommation d'eau.

Etablir immédiatement des contacts avec les responsables du projet d'introduction de plantes de l'USDA/AID et demander des échantillons de légumes et de semences de cultures adaptées aux régions arides de Californie, d'Arizona, du Nouveau Mexique et du Texas afin de faire des essais et d'accroître les rendements.

Mener une recherche pour déterminer l'endroit où la fumure est actuellement utilisée dans les terres où sont pratiquées les cultures sous pluies. Cette utilisation doit-elle être poursuivie dans les terres irriguées.

On doit établir immédiatement des contacts avec les centres internationaux pratiquant l'irrigation et l'agriculture sous pluies en vue d'obtenir une assistance permettant d'élaborer de meilleures pratiques culturales, fabriquer de meilleurs outils et sélectionner de meilleures variétés.

3ème Recommandation - Génie Civil

Aider ou appuyer la SAED dans le démarrage d'un programme de formation d'opérateurs et d'aide-opérateurs de pompe, de mécaniciens et d'aide-mécaniciens au fonctionnement des pompes et des moteurs, à l'utilisation du carburant, l'entretien quotidien, hebdomadaire et mensuel, l'identification des problèmes techniques, aux réparations sur le terrain, à effectuer des commandes et conserver les pièces de rechange, et aux techniques d'entreposage en contre-saison.

Formation d'un gestionnaire et d'un aide-gestionnaire du système hydraulique pour chaque périmètre. Actuellement, ce travail est généralement effectué par le président du périmètre.

Le nivellement du terrain, le creusement de fossés, la construction de clôtures de séparation, de digues, les techniques de compactage, la maîtrise de l'eau, l'utilisation de conduits les techniques de conduite d'eau et d'extension des champs, les besoins en eau des cultures, la production de cultures irriguées, etc. doivent être inscrits au programme de formation. La plus importante partie de cette formation doit être reçue sur le tas à Bakel.

Encourager la SAED à se procurer des pompes et des tuyaux supplémentaires et à retirer les pompes des petits périmètres où il n'existe qu'un seul opérateur et où aucun effort n'est déployé pour accroître la superficie de ces petits périmètres au terme de la deuxième ou troisième année.

Quelques efforts doivent être déployés pour tester la résistance des divers tuyaux aux conditions locales, déterminer la vitesse la plus efficace des moteurs des différents modèles de pompe, réaliser des rigoles de décharge en béton ou avec d'autres matériaux, des vannes, des obstrueteurs de fossés ou des barrages, etc. pour aider les membres du périmètre à construire, faire fonctionner et entretenir le système. L'élaboration d'un système de recherche s'avère nécessaire pour l'encadrement à long terme et les prises de décisions.

Eriger quelques brise vents avec des arbres à croissance rapide et tester leur efficacité quant à l'utilisation de l'eau, la régulation des températures et contre la déshydratation des cultures par les vents chauds.

Améliorer la batteuse à nédale (notamment, en échelonnant les épis sur le cylindre, en éliminant les blocages de la partie arrière, en réduisant le poids et le prix, etc.). Des contacts doivent être établis avec les consultants de l'Institut International de Recherche sur le Riz (IRRI) pour aider à adapter un équipement léger et efficace.

Il est nécessaire de travailler à la conception d'une unité flottante appropriée. Les unités métalliques de celles en fibre de verre se cassent du fait de la petite surface de base du support de la pompe, des vibrations du moteur et des collisions avec les débris flottants. L'utilisation de poutres plus larges comme supports, de contre-plaqué plus fort, collés ensemble avec de la glue marine et encadrant la fibre de verre et les supports en caoutchouc, pourrait contribuer à amortir les chocs provoqués par le fonctionnement du moteur.

Obtenir les décortiqueuses et les polisseuses de riz qui seront bientôt nécessaires pour la production de Bakel.

4ème Recommandation - Economique

Les procédures d'octroi de crédits aux groupements de producteurs doivent faire l'objet d'une plus grande attention.

Le système d'accumulation des capitaux destinés au renouvellement des pompes doit faire l'objet d'un examen minutieux. Un programme de prêts directs doit être envisagé.

La politique des prix de riz et des engrais doit être revue.

Des dispositions doivent être prises pour limiter la superficie de chaque périmètre à 50 hectares au maximum et le nombre d'ouvriers agricoles à quatre ou six par hectare.

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Il est probable que pour que les exploitations agricoles irriguées soient économiques, leur superficie doit être de deux hectares environ, et le nombre d'ouvriers ne devrait pas dépasser 100 à 125 par périmètre pour que leur supervision soit possible.

5ème Recommandation - Sociologique

Une collecte des données et un encadrement systématiques devraient être institués dans quelques villages judicieusement choisis, pendant un cycle agricole total. Ceci permettrait d'évaluer l'impact de la technique d'irrigation sur le plan socio-économique.

6ème Recommandation - Mise en Oeuvre

L'AID devrait bientôt procéder à une vérification des intrants du projet. Plusieurs domaines, et en particulier ceux concernant le transfert des fonds, doivent faire l'objet d'éclaircissements.

Les relations formelles définissant les rôles des conseillers expatriés, du gestionnaire du projet AID et du directeur du projet de la SAED à Bakel doivent être établies. Les assistants techniques du projet doivent être tous nommés et travailler avec les producteurs villageois.

Des dispositions spéciales doivent être prises pour charger l'USAID des petites commandes du projet. Le gestionnaire du projet de l'USAID et le directeur du projet de la SAED à Bakel autoriseraient conjointement ces achats.

Le coût des études de génie, réalisées par la SAED a été imputé à la subvention de l'USAID. Cette décision devra être justifiée. Il semble que le coût de ces études devrait être supporté par la SAED en guise de contribution au projet.

La SAED devrait sentir la nécessité d'approvisionnement et des systèmes de pompage et d'irrigation.

Améliorer les conditions de vie des agents en service à Bakel - électricité, aménités, logement, transport, etc.

Les aires de stockage doivent être améliorées. Les engrais, les pompes, les tuyaux et le matériel sont exposés aux intempéries, sans protection. Ils doivent être couverts et les barils de carburants inclinés ou stockés au-dessus du sol.

III. ANALYSE

A. L'aspect agronomique des périmètres

Dans le document initial et les analyses subséquentes du projet, le problème de la maîtrise de l'eau a été traité comme si toutes les questions relatives au génie et à l'aspect agronomique avaient trouvé une réponse. Sur le terrain, il est évident que tel n'est pas le cas. Les pompes sont en place, l'eau est pompée, les semences plantées et les engrais utilisés. Mais les pannes sont fréquentes, les fossés insuffisamment creusés, la sélection des variétés incomplète, l'utilisation des engrais inadaptée à la fertilité des sols, et l'utilisation des pesticides presque nulle. Par conséquent, les rendements sont faibles et les coûts élevés.

Il ressort des observations qu'un grand nombre d'améliorations peuvent être apportées aux techniques de production. Les rendements s'accroissent au fur et à mesure que les producteurs gagnent en expérience.

<u>CAMPAGNE AGRICOLE</u>	<u>RIZ</u> T/HA	<u>MAIS</u> T/HA
1975-76	2	1.67
1976-77	2.2	2
1977-78	2.7	2.50
1978-79	3.7	2.50
1979-80	3.8-4	2.50

Les rendements des terres irriguées peuvent être beaucoup plus élevés, surtout pour le riz. Beaucoup de producteurs affirment avoir des rendements de 5-8 tonnes à l'hectare. On estime qu'avec un investissement relativement faible, la plupart des producteurs peuvent doubler les rendements des cultures de cette année et introduire de nouvelles cultures plus rémunératrices. Mais cela nécessiterait des changements de variétés et de pratiques culturales.

Des observations ont été faites concernant des problèmes agricoles particuliers. Ces problèmes sont au centre des efforts déployés en vue de consolider les acquis de la production et de la situation financière avant que ne soient envisagées de nouvelles extensions de périmètres.

1. Maîtrise de l'eau

Le manque de moyens adéquats de maîtrise de l'eau est probablement le seul obstacle majeur à une forte production dans la zone de Bakel. Ceci découle de plusieurs causes différentes:

Orientation of Senegal's Five Four Year Plans**I Plan (1960-1965)**

- A. Coordinate and strengthen all means of development
 - 1. Promote a sense of responsibility
 - 2. Adapt State intervention
 - 3. Mobilize the nation
 - 4. Carefully use international aid
 - 5. Encourage the participation of private capital
- B. Give priority to the most productive actions
 - 1. End isolation of the peripheral regions
 - 2. Encourage national cohesion by common language and institutions
 - 3. Give priority to the most productive operations
- C. Prepare for the future

II Plan (1965-1969)**1. Immediate Action**

- 1.11 Develop rural economy
- 1.12 Provide basic conditions to develop the industrial sector
- 1.13 Develop commerce
- 1.14 Maintain activity in housing sector
- 1.15 Reduce import while expanding exports
- 1.16 Balance the budget

1.2. Long Term Actions

- 1.21 Manpower training
- 1.22 Regional programs
 - 1.22.1 Integrated Development
 - 1.22.2 Study Fleuve Region
 - 1.22.3 Reduce Dakar immigration and expand outmigration
- 1.23 Infrastructure
 - 1.23.1 Economic integration in West Africa
 - 1.23.2 Build up Dakar-Thies axes
 - 1.23.3 Balance growth of regions
 - 1.23.4 Organize countryside
- 1.24 Rural and Urban Housing

III Plan (1969-1973)

Same as previous plan

IV Plan (1973-1977)

1. Lays out by projects general economic and social goals.
2. In production sector
 - Develop production for maximum resources
 - Agricultural sector is a top priority
 - Look to industrializing of agriculture production.
 - Mineral research important
 - Tourism sector is a priority
3. Infrastructure
 - Maintain present structures
 - Open up isolated areas
4. Social
 - Education for medium and long term needs of Senegal
 - Support technical, professional and rural education
 - Support culture, national ideology and selling of local art
 - Support health
 - Provide comforts - water, showers and housing
5. Research
 - To take a positive orientation
6. Budget

V Plan (1978-1981)

A. Priorities

1. Training and productive sectors have priority
2. Higher education is a superiority,
Agriculture first priority before industry

B. General orientation

1. Productive sectors
 - a) Rural Development
 - b) Industry
 - c) Tourism
2. Indirectly productive
 - a) Transportation and Telecommunication
 - b) Social
 - c) Research
3. State Budget
4. Exports

Resumé of Elliot Berg's Macro Economic Evaluation

The present economic crisis in Senegal is the most severe in its modern history. It represents a bankruptcy of Senegal's development strategy since independence. The extent of the crisis can be seen in 1979 figures on external debt (265 billion CFAF equalling \$1.26 billion), debt service (24.5 billion CFAF equalling \$116 million) and balance of payments (60 billion CFAF equalling \$285 million).

In addition, this crisis points out an accelerating deterioration of the major institutions and instruments of rural development. For the most part the RDA's (SAED, SODEVA, SODEFITEX, ETC.) are failures. This inability of the RDA's to adequately deliver service is documented in recent CCCE, FAC and World Bank evaluations. Generally these reports indicate the RDA's produce limited services at high cost, have no rapport with the peasant, and have little impact on production.

The cooperative structure is found in a state of deterioration along with the credit system they are to support. Peasants are refusing to pay debts. Total rural indebtedness now stands at over 171,000 tons equivalent of peanuts. Contributing to this bleak economic picture is Senegal's no-growth economy.

How could this happen? Senegal at independence had a skilled civil service, an industrial base, and a monetized agriculture. Since independence, major investments have taken place supported by major aid inflow. The principal reason given for poor growth in Senegal's economy are erratic rains, limited natural resources and the "Vienna problem" of scaling down Dakar to a shrunken economic/political role compared to pre-independence days.

However, there are other, more fundamental reasons for no-growth. A) neglect and/or abuse of Senegal's farmers by state organizations. B) the seriously deficient planning and decision making process of the public sector, and C) despite this deficient planning and decision making ability, the State has taken on the major role in organizing and executing development programs. This is a task it can not carry out.

The implication of this diagnosis for Senegal and donors is that the old patterns can no longer be fruitfully followed. We have come to a dead end. Tinkering with the problem will no longer be enough to solve it.

For example, even with the present major flow of resources to reform the RDA's (e.g. SAED), they will not work. If the RDA's and present institutions and policies are not working, what can? The answers are to build from the bottom and create an environment conducive to the emergence of decentralized rural institutions which will lead to improvement in rural life. What this means can be seen in a couple of examples, agricultural credit and agricultural extension.

First, the assumption that a government agency can effectively handle a subsidized rural credit program or even that such a program is desirable is no longer valid. Note as evidence of this the wasteful use of resources due to subsidized prices, the negative effect on rural saving propensities, the inhibiting of the development of local institutions and the bondage peasants feel to the "monopolists" of the public sector. More specifically note the failure of the present credit system in Senegal.

A new consensus is developing on assumptions about the need for State-run farm credit programs. Research by such scholars as Dale Adams at Ohio State are finding that when full transaction costs are calculated, the informal money market is frequently cheaper than formal loans.

Second, is the agricultural extension effort. This effort is central to GOS rural development programs. It is also the main preoccupation of aid donors. But is this emphasis really necessary? The present technical packages provide little new advances that are economically valid. Most farmers are already aware of the technology that is useful. As far as inputs are concerned, hundreds of thousands of tons of fertilizer have been used and over a million farm implements bought. There is no need to continue to "sell" the use of these inputs.

Why bother with these costly, laborious extension operations which most people admit will not have much effect unless product prices are attractive and the input supply system functions better? Why not encourage the development of decentralized markets for inputs, allowing private and public agents to compete in sales and output marketing? Why not, in other words, transform the whole approach to stimulate agricultural production?

These questions suggest the need for new directions of future donor programs. Putting money and skill into public institutions to make them work better or do new tasks may not be the answer. Even if we succeed in this venture, we may only be re-enforcing a set of inappropriate bureaucratic structures rather than allowing new forces to develop.

Instead of strengthening the SODEVA credit operation, why not devise programs which encourage the emergence of more vital rural financial markets, including old-fashioned ideas like agricultural banks?

Instead of the present pattern of the Sine Saloum Primary Health Care Project of creating another public organization to supply medicines, why not encourage private trade in medicines?

The present crisis in Senegalese development highlights three additional issues for AID strategies: 1) recurrent cost, 2) economic soundness of AID projects and 3) AID project preparation and review process.

Short of some miracle, the GOS will remain in a fiscal crisis throughout the 1980's. The present debt burden and poor economic performance related to fundamental productivity problems are two major reasons for this. Several recent investment decisions also aggravate this situation. Dakar Marine, a 50 billion CFAF investment, will require at least a billion CFAF a year in recurrent cost. Other investment projects based on State subsidies will add to the drain on budget resources. Projects such as the University in St. Louis are another big source of future recurrent cost claims.

This raises questions about the future prospect of AID programs, especially in rural development. All RDA's have until now been financed principally by donors including major recurrent cost support. We, and other donors, are increasingly asking the GOS to take over these costs. Yet evidence is that the RDA's are too costly for what they yield. We must not pass on experiments which fail (or are not genuinely productive) as permanent recurrent cost burdens for the GOS.

This leads to the second issue: the economic soundness of AID projects. While all the evidence is not yet in, it nonetheless appears striking that projects which AID hopes will be productive seem to rest on shaky economic foundations. Questions arise on the economic viability of the Bakel Irrigation Project. Studies have shown that rice production receiving a market price in the Fleuve of 4250/ton (world market price for 80% broken rice) has a negative rate of social profitability.

The Cereals Project II predicts high returns, at the same time the CCCE and World Bank conclude that SODEVA operations are unprofitable. It seems likely that Cereals Project II will have no better yield than other similar projects in Senegal in the past twenty years - which is to say, a low yield.

A third project is SODESP (livestock). The economic viability of the fattening operation that is the bases of the SODESP project has been criticized by a number of economists. Yearling calves are too costly to purchase, they are fattened on high cost forage and the limited market for high quality beef means uncertainty in gaining the premium price necessary to compensate for these higher costs of production.

All these suggest the third point: AID's project selection process. AID has to do better in this area. The question is how. Two possibilities for improvement come to mind. First, the Mission could informally test important project economic analysis with one or two outside consultants. Secondly, some way ought to be found to assign responsibilities for faulty (or good) work. Somehow we have to introduce better incentives, more punishment and rewards for the principal players in the project making drama.

These are only suggestions of what a new direction may be. At this stage is enough to make the argument that we have come to the end of the road in attempting to use heavy, ineffective bureaucracy to achieve development objectives. No longer can we say that if there is a shortage of agricultural technicians - set up an agricultural college! If SAED is crippled organizationally and ineffective technically - send in a technical assistance team! If the cooperation structure breaks down we can not continue to assist a development agency which depends on the cooperative structure. If we recognize that these approaches are almost sure to fail in the future, as they have in the past, we can begin to think about substitute approaches.

Some General Issues Arising out of the
Joint Assessment

1. Design/Management Issues.

1. Productivity of project activities.

To varying degrees all three project evaluations and macro-level report underlines the need for greater productivity in the activities being created by the projects. Productivity in this context means the increasing of efficiency through greater outputs (production, services) from the inputs employed. This concern is explicitly stated in the Bakel Irrigation and the Sine Saloum Health projects.

This issue relates to a number of sub-issues:

a) Recurrent costs.

Recurrent cost problems are basically related to the routine design of projects in a form that requires greater inputs to operate than the value of the physical and social outputs they generate. While every project has a certain gestation period before it can be fully productive, when that period is over, the project must be efficient or it will never generate the outputs needed to cover its cost. Many of the projects and institutions we are helping to create seem to be in this position.

b) Welfare vs. Development projects.

AID has to be very concerned that it does not create welfare projects rather than development projects. A welfare project is one in which inputs are used, even appreciated, by the beneficiaries but which results in no significant change in their behavior or in the institutional structure which will allow for the continuation of the activity after financing is ended. In a development project the necessary structural or behavioral changes occur which provide new services, better organization or greater production. A means of measuring the success of the development is the balance between the value of the benefits received and the real cost to receive them.

c) Greater involvement of beneficiaries.

It is evident from all three evaluations that greater involvement of the beneficiaries in the design, implementation and financing of the project themselves would result in greater efficiency. The Bakel evaluations, in particular, stress the wealth of indigenous information not incorporated into the project. This highlights the need to expand the role of non-public (i.e. local) institutions in carrying out rural development.

2. Reduce the pace of project implementation.

All projects evaluated have set overly ambitious implementation schedules compared to the reality of their actual implementation. Whether intended or not, all the projects are experimental in nature. A greater awareness is needed of the real time dimension of doing these basically experimental operations in Senegal, particularly if one continues to use Senegalese institutions. Similarly, one needs to be aware of the necessity for larger time frames in projects involving training, institutional and human resources development.

3. Role of projects as experiments.

As noted above, all the evaluated projects are experimental in nature even though they are not called pilot projects. This is due in part to our lack of sufficient data and prior successful experiences in project design and implementation. Project designs and implementation schedules must accentuate proper research/experimental methodology so that, in the future it will be possible to obtain the information required to develop more successful future project designs, disseminate technological packages and replicate organizational activities. This requires four elements generally lacking in all projects:

- 1) more explicit definitions of working hypotheses and assumptions in project design, leading to the collection of specific data needed to test these hypotheses;
- 2) actual collection of the data both prior to and during implementation; baseline data and data from monitoring activities to assess project progress.
- 3) complete documentation of project results for future use and;
- 4) greater flexibility to modify project design in light of verification or negation of the project's working hypothesis.

4. Expanded training needs.

All project evaluations strongly underline the need to greatly increase the capacity of the beneficiaries and project personnel to carry out project activities. Two areas of particular concern are noted: 1) the capacity of local Senegalese institutions to carry out the management and logistics tasks for which they are responsible in the project design, and 2) the capacity of local level technicians, and beneficiaries to manage the operational aspect of the project. In both instances this means an increased role for training, not only in the technical aspects, but in broader based skills such as general maintenance, record keeping and management.

5. Isolation of project. Lack of previous collaborative nature in project design.

It is evident from the evaluation reports that more collaboration is needed in project design than has happened in the past. For example, assumptions on SAED's capacity to carry out certain activities would not have occurred if a full awareness of the SAED capabilities were taken into account in the project design. Redundancy in the rural health project would have been avoided if greater collaboration with other donors and GOS had occurred at the design stage. AID projects are often isolated from the economy and even the sector in which they work. The general avoidance of a collaborative approach to project management has resulted in "crisis" management design: reliance on higher level decision making to solve a succession of lower level crises.

6. Management issue.

Four major management issues relating to both project design and implementation arise out of the evaluations:

a) Collaborative management.

Up to now AID has generally shied away from playing a direct role in project implementation and management and has relied on GOS institutions and organizations. This has led to a number of difficulties. AID now needs to rethink this issue. As previously noted, the lack of collaborative management at local levels of the projects has resulted in higher level crisis intervention than would be necessary for the kinds of problems involved. AID must seriously consider taking a more active role at all organizational levels of project management and implementation.

b) Lines of authority/accountability of AID technicians.

Partly as a result of undefined scopes of work the placement and responsibilities of AID technicians and GOS technicians has caused some friction and inefficiency in project implementation. Whether the AID technicians should be in line or staff positions is unclear from the evaluation reports but the need to clearly define the role of these technicians and their relationship to AID, to the GOS, and to the project is very evident.

c) Logistic support of the projects.

A number of logistic support questions were expected and occurred in the projects' evaluations. Vehicle control, maintenance and support were a major concern in the Bakel project. Supplies of drugs, furniture, pumps and other inputs were also a

major issue. An underlining element is the question of project concentration and logistic support. In more isolated regions, like Bakel, major initial project efforts were provision of logistical support to GOS and AID technicians, often at the expense of project goal advancement. This was the result of the need to have such logistical (housing, vehicles, furniture, etc.) support to attract and keep both AID and GOS technicians in the field. Now that the major expense has occurred to provide this infrastructure, it can be argued that AID should concentrate more activities in this area (Bakel) to maximize the return on this logistic investment, rather than incur additional expense in providing logistical support to a new geographical area.

d) Fiscal accountability of project.

Related to the whole management issue is the lack of fiscal accountability to AID of the projects. Audits were requested in all evaluations. Because GOS officials and/or organizations are the main local level implementors and disbursers of AID funds, and often have a low level of accounting and control, it is difficult in some cases to fully account for all funds spent.

II. Policy/Macro Issues.

A number of issues at the macro or policy level have evolved from the project evaluations.

1) Nature of project/program mix-design policy

a) Type of projects.

The evaluations raise a number of questions on the nature of projects AID is undertaking. Should our projects be institutional development, pilot or operational or some mix thereof? Institutional development projects are slow, difficult and expensive with long gestation periods before productive results occur but they are basic to development. As noted, all our projects are experimental but have not been clearly defined as such. At the same time, AID needs to respond to urgent requests from the GOS and Congress for results. Thus, operational projects in which AID or outside contractors do most of the work may be needed to get visible results quickly. The basic issue may be that we must fully recognize the strengths and limitations of these three types of projects and not design projects of one type with expectations of another, i.e. to design what is to be an operational project, with expected quick results, when in fact it is really an institutional development project whose results are a long time coming.

b) Project a program approach.

Beyond the question of project mix is that of whether the

project approach is appropriate for resolving development problems. A program approach with a mix of projects and other assistance instruments may be a more appropriate avenue to pursue. How to do this remains a major question.

c) Project add-ons.

In most of our projects supplemental activities have been added-on to project design. Health, WID and Promotion Humaine are the major supplemental activities. How effective are they? Should and how could they be more integrated within the project? Some evidence indicates that they are isolated elements and in one case detrimental to the main project operations. The role of these add-ons needs to be closely looked at.

d) Geographic concentration.

As noted earlier, the case for geographic concentration of AID activities is compelling. Beyond the logistic question are issues of interrelated support of development activities and the GOS' desire for multi-donors in a geographic region.

2) Macro-issues.

Linkage of the project to macro economic issues appears to be a major gap in AID programming. For instance, the Bakel livestock evaluation indicated the project has no connection to the livestock sector, let alone the economy. It is in isolation from other projects in the area and from the economy as a whole.

AID projects tend to be oriented to increase production (more health huts, more hectares of irrigation, more tonnage produced) whereas Senegal would be better served by increased productivity (more health service with less cost, greater yield per input, etc.).

These two approaches are often intertwined. The difference can be seen in the following example. AID is often advised to encourage the GOS to raise prices paid to farmers for their produce to encourage them to increase production. While this seems to make sense, and increasing prices may well increase production, there is some question regarding the full cost. For example, millet can be purchased in the States and shipped to Dakar for \$50/MT less than purchased in Kaolack and shipped to Dakar. An answer to this dilemma may well be to increase production through increased productivity so as to lower the real cost of food and provide the possibility for the farmer to have access to a more equitable share of the benefits from development assistance.

MEMORANDUM

DATE: May 19, 1980

TO: USAID STAFF

FROM: Donald Brown, Joint Assessment Coordinator

SUBJECT: The AID Joint Assessment Workshop

On Monday, May 12, 1980, an all day workshop was held in the conference room of the Hotel Indépendance on analysis of information gathered in the joint assessment of the USAID program in Senegal. The workshop had approximately 35 attendees including three members of the U.S. Embassy staff (DCM, Economic Officer, Political Officer) and most of the non-clerical USAID staff, both U.S. and local hire.

The purpose of the workshop was two-fold. First, to start a process of participation by the mission as a whole in the joint assessment/planning exercise. Secondly, to seek from the mission the major issues and observations evolving from data collected from the joint assessment and the staff working in Senegal. These observations were then developed into recommendations suitable for inclusion in the final report of the joint assessment.

The workshop began at 8:30 AM with a brief introduction on the workshop and its setting vis a vis the joint assessment by Donald Brown, coordinator of the joint assessment. A summary was then given of the day's agenda followed by a brief verbal resume of the major assessment documents. (Copies of these documents had been made available to all participants during the previous week). The general groups were then divided into four subgroups by random selection.

The task of the first small group session was to "brain storm" in a structured way their observations on problems noted from the joint assessment documents and their own experience. This was done in the following manner: During the morning general session a worksheet was given each participant. They were instructed to write down observations from documents and experience related to the USAID program in Senegal. Each small group member reported one item on his/her list in a round robin fashion. These were noted on sheets of newsprint. This process continued until all observations were noted. Discussion in the group was limited to clarification of ideas, not evaluations. The process took about an hour.

The small groups were again merged into a general assembly and reported their observations. A listing of these observations is in Annex A. Once these observations were reported a general discussion about them continued until lunch.

During the lunch break (12:30 to 14:00) the joint assessment team grouped these general observations into five broad categories (management, policy, design, implementation, GOS/AID relationships) and placed them on newsprint for the afternoon session.

After lunch the general assembly again divided into five smaller groups by random selection with each responsible for one of the five categories. While it was obvious that there would be overlapping of various observations between categories, each group was asked to limit its discussion to the category assigned. The task was to analyze the relationship of the noted observation to the assigned category. This analysis would lead the group to recommendations on how to deal with any particular observation or clusters of observations within the context of the category given. It was noted that alternate and possibly opposing recommendations might occur and, if so, should be noted. If important relevant observations, not previously noted, occurred during the discussion they were to also be included and discussed in the same manner as those previously already presented. After 1-1/4 hours the groups were again called together to report their recommendations. A listing of these are in Annex B.

After this group report, there was an hour general discussion on these findings. The workshop ended at 17:30 after closing remarks by Mission Director David Shear.

ANNEX A

Summary of General Observations from Morning Small Group Session

- Insufficient USAID knowledge about GOS
- USAID success criteria different from GOS
- Need for greater access of GOS to USAID project documents
- AID financial procedure too cumbersome
- Confused relationship between USAID and GOS project level staff
- Not enough involvement of USAID managers in projects
- Need for greater language capability of USAID technicians
- Lack of internal integration of knowledge within USAID
- Need to pay attention to specific targets in conditions' precedents
- Lack of project monitoring and feedback
- USAID is more concerned with housekeeping than project implementation
- Too many USAID people doing administration rather than management
- Turnover in project management staff is excessive
- Weak GOS operational and financial managerial capability
- Need to reduce, not expand, GOS workload
- Poor GOS record-keeping systems/financial procedures
- Lack of technical expertise of GOS personnel
- Limited GOS coordination/supervision of projects
- GOS officials' and beneficiaries' objectives and goals are not often known by AID
- Need to build up GOS institutional productivity

- Need for more local level participation in projects
- Need for more host country contracts rather than AID contracts
- Need for increasing use of Senegalese in project implementation and design
- Need for joint criteria for evaluation projects
- Need for more phasing-in of project implementation
- Task of communication between USAID and beneficiaries
- Management issues drive out experimentation
- Need for local procurement
- Need for greater flexibilities in project implementation
- Project design too complex - often has U.S., not GOS, specifications in mind
- Project designers have lack of access to all necessary information
- Need for more base line data
- Technical packages are extended before adequate testing.
- Inappropriate U.S. training of participants
- Inability of GOS and AID to get rid of "deadwood"
- AID project only adding additional layers of bureaucracy on local people
- Lack of alternate project approaches
- Projects do not incorporate incentives to producers
- Lack of a productivity orientation of USAID projects
- Projects do not take comparative advantage into account
- There is a failure to explore potential private sector involvement
- USAID program is overextended - rely too much on outside experts
- AID needs to be able to admit failure
- There is no "bail out" capability
- Planning is not realistic vis-à-vis time and scope of potential accomplishments
- Lack of project consolidation
- Lack of coordination of projects with other donors
- Unrealistic expectation by AID of GOS policy changes which are implementable
- Lack of appreciation of urgency and magnitude of global Senegalese assistance needs.

ANNEX B: Report of recommendation from afternoon working groups

DESIGN RECOMMENDATIONS

It is recommended that:

1. Design teams should make greater use of local expertise, PVOs, Peace Corps, local institutions and staff from the parastatals, ministries and departments. Efforts should be made to make use of expertise from other African countries.

2. Some of the project designers become a part of implementation, evaluation and monitoring of the projects designed. People involved in the original design should also be a part of the decision to expand the project after the initial pilot phase.
3. Beneficiaries of any new project should be directly involved in an early stage in the design of that project.
4. The whole design process should be more dynamic and flexible so that changes can be made during the implementation at designated intervals. The current procedures should be used more frequently.
5. The briefing of U.S. consultants in both Dakar and D.C. be improved. This will help alleviate the pressures on project managers and improve the quality of service.
6. Other donor design processes be studied in order to streamline U.S. design and review procedures.
7. Project designs include the following:
 - a. clear statements which distinguish objectives and goals of project for all interested parties from Ministerial level to village level beneficiaries;
 - b. realistic time frames for achievement of measurable targets;
 - c. specific times for decisions on expansion of scope, redesigns for possible redirection of the project;
 - d. alternative scenarios for project implementation.

IMPLEMENTATION RECOMMENDATIONS:

It is recommended that:

1. A survey be undertaken of the Senegalese human resources available in order to:
 - a. identify possible management and counterparts. This should preferably be done at same time as project design;
 - b. define training needs of local staff. Training of staff should be done in-country and related to project objectives. Improve incentives for Senegalese staff;
 - c. to sensitize ministerial level people on needs of project level management;

in addition, project officials should be assigned permanently, or long-term, to a project in order to assure continuity;

project directors should be trained in all USAID procedures as well as GOS government administration.

2. In designing projects, assure agreement on the management structure. The responsibilities on both GOS and USAID sides must be understood.

3. USAID project managers should be trained in all administrative procedures. This should include PSCs.

3(a). Remove the administrative burden from project managers through hastening development of project support office.

(b). Increase technical involvement with the project by the project managers.

4. Project agreements should be used as a tool to insure coordination between Senegalese agencies, departments, ministries involved in implementation. "Add-ons" to ProAGs should be discouraged from AID/W.

5. Training be given at local (village) level on record-keeping, project objectives, general management skills.

6. Projects be designed at a level of complexity or simplicity appropriate to the level of skills of the implementators. Pre-testing of technical components is necessary. Existing experts should be more efficiently used.

7. In project agreement there should be a process for regular joint reviews of progress and implementation. When objectives are not being met, project redesign should be considered through the established channels of amendments, project implementation letters, etc.

MANAGEMENT RECOMMENDATIONS

It is recommended that:

1. GOS counterparts be familiarized with AID financial procedures and expectations.

2. Annual AID audits of all projects be done.

3. Project support unit be implemented as soon as possible in order to free project managers of housekeeping chores and assist procurement procedures.

4. AID use flexibility that is now built into project agreements to redirect the project on the basis of evaluations or shortfalls in meeting goals. Not all projects will need to be changed.

5. There be longer tours of duty for AID direct hires and a stronger Senegalese staff in order to increase continuity in the projects.
6. AID establish a professional central filing system with a professional to run it. This would include documents, correspondence, record-keeping and library materials and would help to develop an "institutional memory."
7. Beneficiaries of projects be informed and understand project goals and their responsibilities toward meeting these goals. This process should be done through GOS channels, not necessarily directly between AID and the beneficiaries.
8. There be greater and more frequent use of local (Senegalese) contractors and talent. This should include the private sector.

GOS/USAID RELATIONSHIPS

It is recommended that:

1. There should be increased contacts between AID staff and GOS officials, both officially and socially. To this end:
 - a. The Mission should make available representational funds;
 - b. Increase opportunities for group and individual lunches;
 - c. Increase emphasis on language training.
2. Continue the search for opportunities in which U.S. direct hires can work out of GOS offices. Conversely, the policy for increasing numbers of Senegalese in AID offices and projects should be continued.
3. The Mission establish an in-depth orientation program for new arrivals, with focus on the Senegalese society. This could be contracted to the University or other educational institutions.
4. ICA be more involved in disseminating to the Senegalese with AID is doing.
5. AID look into possibility and legality of having one GOS agency being given the overall authority for project implementation at the local level, in keeping with GOS and USAID policies of encouraging decentralization of decision making..

5.5.7

6. The continuation of the Management Committee (Ambassador, USAID Director, Ministers of Plan and Finance) as a more permanent coordinating mechanism.
7. Training of Senegalese public and private sector managers be coordinated with World Bank project.
8. Explore the possibility of using Agricultural Commodity Import Program with counterpart funds as a means of project support.
9. Consistent use of AIP (pilot projects) with emphasis on data collection and feedback from local beneficiary population.
10. Project managers share the information and documentation at their disposal with Senegalese counterparts.
11. Ways be explored to motivate GOS officials. This could include the use of indemnities as part of projects.

POLICY RECOMMENDATIONS

It is recommended that:

1. In order to better judge the quality and success of its programs, AID should:
 - a. increase the audit and evaluation capability of the Mission by seeking a full-time auditor to be based in the Mission;
 - b. require establishment of evaluation criteria to judge project performance at the PP stage if not earlier. These criteria should be established with the GOS office concerned with the project;
 - c. reduce objections to cancelling projects due to poor performance by GOS; Mission should seek to rechannel resources lost by cancellation of project to other projects within Senegal.
2. AID should have a mixed project portfolio with short-term projects for economic and political impact while carrying out long-term projects for more fundamental economic social development.
3. AID should concentrate its projects within a few geographic areas in order to increase their efficient management.

4(a). In order to maximize success of any specific project, AID should be aware of and, if necessary, develop projects related to auxiliary elements to support central project activities (health, alternate energy, marketing, etc.)

5. AID projects should be developed in close coordination with other donors and with GOS related activities in order to assure that all auxiliary elements of support are dealt with.

6. AID must increase its capability to manage institutional contracts. Until that capability has improved, efforts should be made to limit such contracts to the managerial ability that exists within the Mission.

5.6.1

COMPTE RENDU - PLENARY MEETING 27 MAY 1980

The meeting was opened at 15:45 by the Director of Planning, M. Malik Sow. After introductory remarks on the purpose of the meeting and of the Joint Assessment, he called on Mr. David Shear, USAID Mission Director to speak. Mr. Shear, in turn, asked Mr. Donald Brown, Coordinator of the Joint Assessment, for comments on the purpose of the meeting. Mr. Brown indicated that the Joint Assessment is a future oriented exercise, not one to dwell only on the past, but also to see how USAID programming could be improved. This will be done in the joint planning phase to follow the assessment. He also indicated that USAID was searching for more effective ways to support and expand the U.S. assistance effort in Senegal. Mr. Shear then expanded on these remarks.

The meeting was then turned over to M. Cheikh Tidiane Sy, Director of ENEA, who gave a summary of findings and recommendations of the four beneficiary surveys undertaken of USAID programs. Mr. Sy made three major points about USAID programs, as was seen by the beneficiary survey.

1) On the whole all four projects were working badly. 2) There was poor/low involvement of the beneficiaries in project design and implementation. In Mr. Sy's view, this was one of the basic reasons for the poor performance of the projects. And 3), while the projects were not performing as they should, all of them were considered useful and a benefit by the beneficiaries surveyed.

At the end of each summary the service concerned asked questions and sought clarification of the findings. These were responded to by the ENEA staff present. To end his summary M. Sy indicated a time schedule to finish the work of the surveys.

M. Sow indicated that the Ministry of Planning also supported the need to make beneficiaries more aware and involved in projects that affect them. He then asked for Mr. Shear's comments.

Mr. Shear noted the need for funds to make studies such as ENEA has done to better understand the effects of projects on beneficiaries. He noted that this was a part of a larger need for funding in a wide range of areas for more non-project assistance to support project activities. He detailed various possibilities of using such non-project and local currency funding that would be generated from such things as a commodity import program.

5.6.2

He stressed the importance of recurrent costs and the need for AID to question itself to examine its program for positive and negative aspects. He then went on to list several possible future types of programs USAID would consider.

Mr. Shear said that while USAID is prepared to look at these new areas, it must also note certain managerial problems in doing so. Thus there is a need to look at not only financial but also technical assistance needs. He hoped that this joint planning will increase resources coming from the U.S. to Senegal. But how to manage these additional resources so as to have the most benefit to Senegal must be studied.

Mr. Shear ended his comments with a discussion of the role of USAID as a catalyst for funding in the OMVS where some 250 million dollars in assistance inflow over the next 5-6 years should occur.

Mr. Sow noted that Senegal needed help to improve its absorptive capacity to mobilize additional funds.

After a brief general discussion the meeting then turned to the note on the Réunion de Synthèse (attached) for comments. Mr. Dièye, Deputy Director of Planning, noted the need for funds to carry out the joint planning. He suggested the need for a permanent secretariat to coordinate this joint planning.

One of the ENEA staff noted the need for more on-going evaluations to take beneficiaries into account, but more than this, is a need for means to do something about what the beneficiaries say. A local fund may be needed to do this.

Mr. Dièye commented that there should be a data bank on what is learned from projects and to develop general recommendations on project design. He felt that the Management Committee of the joint planning could play this role.

The meeting ended at 17:30 with the comment from Mr. Sow that indeed the joint assessment was not just an evaluation of the past but was to look at future programs, and he felt it was well started in this direction.

ATTACHMENT

Notes prepared for the Plenary Meeting on 27 May 1980 for
Joint Assessment

Background:

The joint assessment has been undertaken as a collaborative evaluation of the USAID program in Senegal under the direction of a Management committee composed of the Minister of Plan and Cooperation, and the U.S. Ambassador. This evaluation has prepared project evaluations on four USAID projects:

- Bakel Livestock
- Bakel Small Irrigated Perimeters
- Cereals Production (SODEVA)
- Sine Saloum Rural Health

The goal of this exercise is to develop the bases for future joint planning of the USAID program in Senegal. Reviews have been completed of these evaluations with the concerned Senegalese services.

The purpose of the Réunion de Synthèse is to draw from these individual evaluations and the experience of the concerned services with USAID programs, lessons and recommendations to improve future USAID activities in Senegal.

As an aid in doing so, the following list of preliminary recommendations are presented for comment, review and addition by the GOS services concerned. In addition, the view of these services is solicited on the modality of future collaborations with USAID.

These recommendations have been drawn from four separate processes that have identified problems and proposed solutions. The processes were:

1. The evaluations done of the projects.
2. The review of these findings by the concerned agencies of the Senegalese government. A series of debriefing meetings were held to obtain recommendations.
3. The review of these findings and development of extensive recommendations by USAID staff in a day long group meeting.
4. The beneficiary survey done by ENEA.

5.6.4

Some Preliminary Recommendations from the Joint Assessment:

1. Planning and Design (Planification)

- To coordinate planning of USAID programs, a permanent coordinating mechanism should be established similar to the Management Committee of the Joint Assessment (Minister of Plan, US Ambassador, USAID Director, etc)

- To increase efficiency and effectiveness of USAID projects, USAID should concentrate projects within limited geographic areas. Its projects portfolio should have both short term project for economic impact and long term projects for more fundamental economic development. In addition, USAID should explore other means of assistance such as commodity imports, PL 480 funds, etc.

- To improve design of projects, USAID with the GOS service concerned, should make greater use of local expertise, institutions and services both public and private in project design. Beneficiaries should also be directly involved in this process. Further, projects should be designed at the level of complexity appropriate to the skills of the implementators, thus pre-testing of technical components is important. The objectives and goals of project for all interested parties from Ministerial level to beneficiaries also must be clearly distinguished and apparent conflicts resolved at the design stage. In addition, assured agreement of all parties on the management structure of the project is required. Finally, projects must be designed in close coordination with other developmental activities in the project area to assure that all auxillary elements necessary for the support of the project are available.

2. Project Operations

- To improve implementation of USAID projects, USAID and the GOS services concerned, should assume that the respective authority and responsibilities of project implementation staff is clearly defined and understood. Beneficiaries should also be informed and understand project goals and their responsibilities towards meeting those goals. As much as possible, a single GOS agency should have responsibility for local level implementation of the project. Additionally, better coordination of project implementation would occur if AID and GOS personnel work more closely together and were familiar with the financial and operational procedure of each others organization. To assure continuity in project implementation, project personnel should be assigned for long terms and frequent personnel changes avoided. Finally, training in management, project objectives and record keeping should be increased for project personnel and beneficiaries.

5.6.5

3. Evaluation and Review

- To improve the quality of USAID program, periodic audits and evaluations of the projects should be undertaken. Criteria for these evaluations should be jointly agreed upon by USAID and the concerned GOS service at the project design stage. Additionally, realistic time frames of measurable targets should also be agreed upon for regular joint reviews of project progress and implementation.

JOINT ASSESSMENT
BENEFICIARY SURVEY METHODOLOGY

Purpose

As part of the Joint USAID/Government of Senegal Assessment effort, four on-going projects were evaluated: Cereals Production I, Rural Health Services Delivery, Eastern Senegal Livestock, and Bakel Small Irrigated Perimeters. These surveys were planned to describe the impact on the beneficiaries by documenting the extent to which the four projects have achieved their purpose and goal as related to village level beneficiaries; developing a profile of these beneficiaries at the local level; and exploring the perception and acceptance of each of the four projects by their respective beneficiaries.

Theoretical Framework

The framework used in developing the specific survey objectives was an analysis of the project elements based on the log frame, additional information about the project gleaned from the project paper and discussions with those knowledgeable about the project. After laying out the project inputs, outputs, purposes and goals, the aim was to develop logical linkages between outputs and the project purpose and between the purpose and project goal, as those elements related to the beneficiaries.

Evaluation Approach

It was assumed, for these four project evaluations, that implementation problems, i.e., the linkage of inputs to outputs, the success of the project in producing outputs as described in the log frame, as well as consideration of the technical appropriateness of both outputs and inputs, would be treated by the expert teams during field surveys.

The beneficiary surveys would attempt to evaluate the relationship between physical outputs and their social effect and to a more limited extent assess the linkage between the reaching of certain objectives and the project's goals. The linkage between outputs and purpose (or effects) is primarily viewed in terms of the use of project services and facilities by the beneficiaries. The linkage between purpose and goal can be viewed as behavioral changes which are related to the use of project outputs. It is this change which theoretically should, over time, lead to a desired project goal.

The element of time is a crucial one for all four projects. Only one of the four, the Cereals Production Project has been operational long enough to have had a measurable or sustained impact on the beneficiaries. Thus, for most of the

projects, impact cannot realistically be assessed. As proxies for impact we have chosen measurements of use of outputs, support of the project and in some instance through indicators of behavioral change in the beneficiary group. Thus, the knowledge that beneficiaries are using project outputs and modifying their behavior in expected ways makes the linkage of outputs to the goal that much more probable in the years to come.

Two major constraints are important in understanding the choice of evaluation design, in addition to the relatively short operational period of three of the four projects, this evaluation was constrained by 1) the very limited time for survey design implementation and analysis (three months) and; 2) the absence of baseline data to which one could compare the current status of beneficiaries. Thus, a traditional impact study showing change over time was not feasible.

Data Collection

The following methodology was developed to measure as objectively as possible the progress made towards project goals, to describe the actual village level beneficiaries, and to record their perception and acceptance of these four projects.

A survey of potential beneficiaries in each of the four project areas was conducted by the students and staff of the Ecole Nationale d'Economie Appliquée (ENEA). A separate series of questionnaires and research guides was used for each project. The surveys covered the same general topics with questions specifically adapted to each project.

The common elements of the four surveys are:

- 1) Beneficiary profile - a demographic, social and economic profile of the households in the communities selected for interview.
- 2) Antecedents and history - an assessment of pertinent conditions before the project was started in the area, and the extent to which beneficiaries were consulted or involved in the design or early implementation phases of the project.
- 3) Beneficiary participation topics - an assessment of progress toward project goal as indicated by:

- o use of project outputs, their frequency and appropriateness;
- o support of the project, including participation in construction or maintenance;
- o institutionalization of the project by the community;
- o improvement - perception of improved quality of life, health, agricultural production;
- o expansion - interest in expansion or change of the project.

Attachment A describes more fully the beneficiary participation topics. These items were assessed at the individual level in the communities selected for the survey.

Universe of the Study

The four studies followed the same approach in determining the population or universe of interest. For three of the four surveys¹ the universe is defined as individuals in villages which are served by the project in which the project outputs are reported to be in place. In some cases the universe included individuals in villages selected for comparison.² Subgroups of interest include the actual beneficiaries, i.e., those villagers using project outputs, and the potential beneficiaries who do not yet use or are not yet affected by the project outputs.

The respondents included the village chief, some chefs de carré, some heads of families, some wives, some young people and some villagers responsible for the project in the village.

Sampling Plan

The sampling plan for each of the four surveys was developed independently, although all are similar in approach. The ENEA document describes the approach to the sampling, universe and analysis of each of the surveys. The approach taken is basically a two-stage purposive sample with villages as first stage units and individuals as second stage units.

Analysis of Data

The chosen level of analysis of the survey data is necessarily due to the extremely limited time available for editing, coding, tabulation, analyzing data and report writing (three weeks). The information is descriptive in nature, reporting characteristics of groups across villages. Issues addressed in the analysis for each project are partially listed in Attachment B. Attachment C summarizes the guidance USAID provided to ENEA to assist them in limiting the scope of their analysis for the final report.

1. Excludes Bakel Livestock project in which some villages were selected in regions where the project is not implemented.

2. For example six 'transhumance' interviews were made for Bakel Livestock.

Responsibilities for the Survey

Responsibilities for the survey were reasonably clear in the beginning of the planning process. USAID was to develop specific objectives for the evaluation and then, working together with the staff of ENEA and the students, the questionnaire, data collection methods and field procedure development was to proceed. The ENEA staff and interviewers were responsible for the fieldwork and for tabulation, analysis, and report writing. In fact, once the objectives of the evaluation were discussed the projects presented, and some preliminary comments were made on sampling and questionnaire design, ENEA worked almost completely independently. The specific questions and sampling plans were developed for each of the four projects by the ENEA staff and students. USAID provided assistance in working out some logistics problems for the field work. The U.S. Census Bureau worked with USAID in the planning process, including specification of objectives, survey approaches, sampling, and questionnaire design. After the field work was completed by ENEA the U.S. Census representative worked with USAID staff to determine which elements of the surveys should be analyzed first to cover the issues most pertinent to the joint assessment report. More detailed analyses, covering all or most of the variables could be made at a later time.

Limitations of the Data

Based on the sampling scheme employed in the four surveys, conclusions can be applied only to the group surveyed. That is, results or findings from interviews in a village cannot be generalized to apply to the entire village. It is possible that the data and opinions gathered are representative of a village or some other group of interest, but no calculation of reliability can be made to verify this.

Because the sampling of villages was more random than the selection of respondents within the village the data gathered in each village on chefs de carré, family heads, men and women may be generalizable to the project as a whole.

Interpreters of the results of these surveys should be careful to review the actual questions of interest, and the corresponding list of coded responses for each, to better understand the meaning of the question and interpret the findings.

The same questionnaires were administered to all respondents in a project and thus there were some questions which did not apply to all. In interpreting the data from this survey one should be careful to note the number and characteristics of those not responding to any question of interest.

Beneficiary Participation Topics

I. USE AND SOURCE OF PROJECT GOODS AND SERVICES

- A. What are the sources of goods and services used by beneficiary.
Project or other?
- B. Where are they located?
- C. Who provides or administers them?
- D. Are they provided regularly?
- E. Are they currently provided?
- F. How often do you use them?
- G. Who else uses them?
- H. Have you stopped using them? Why?

II. SUPPORT OF PROJECT

1. Have you been asked to provide supporting goods and services to help maintain the project?
2. What have you provided?
3. How long have you provided these goods and/or services?
4. What difficulties or obstacles do you have providing them?

III. INSTITUTIONALIZATION

1. Is there local organization to help implement the project?
2. Are you a member of it?
3. How many others are members?
4. How often do you meet or participate in the organization?
5. What do you do?
6. How long have you been a member?

IV. IMPROVEMENT

1. What are the advantages/benefits of the project?
2. How do you use them?
3. How long have you received them?
4. Have the benefits been increasing over time?
5. Do these benefits contribute to a better way of life for you?

V. EXPANSION

1. How would you change the project?
2. Should the project continue?
3. Are you planning to undertake some change?
If so, what?
4. How is this likely to affect you?
5. Who else is it likely to affect.

Remis le 5-5-80 à l'ENEA

Thèmes d'intérêt pour le rapport sur les bénéficiaires

1. Description des bénéficiaires actuels:
 - Ceux qui profitent des projets,
 - Ceux que n'en profitent pas.
2. Utilisation des biens et services:
 - quels groupes de bénéficiaires utilisent ces services?
 - Les biens et services sont-ils suffisants, satisfaisants, et fournis à temps?
3. Soutien du Projet:
 - Les bénéficiaires, ont-ils participé à la conception du projet?
 - Sont-ils impliqués dans la réalisation du projet?
4. Institutionnalisation
 - Existence et rôle des groupes bénéficiaires pour la gestion du projet.
 - Le projet bénéficie-t-il d'un support local?
5. Amélioration

Les bénéficiaires estiment-ils que leur condition de vie a été améliorée par le projet?
6. Intégration

Quelles seraient les modifications que les bénéficiaires apporteraient au projet?
7. Recommandations pour le futur du projet.

USAID Suggestions for ENEA Analysis

After reviewing the data actually collected and the sampling plan followed in the field work and the form in which tallies are being made, USAID and BuCen suggested the following limitations for ENEA's tabulations. These suggestions were discussed with ENEA on May 2, 1980.

Bakel Livestock

1. Group the respondents by tribe or ethnic group (Toulekedé, Sarré, and Transhumance) and by region, if the groupings by tribe are not regional. Use these groups for analysis.

2. The following questions from the ENEA questionnaire were determined to be of higher priority than the others for the report:

1	13	26.3	37	49
2	22	26.4	38	50
3	25	26.5	43	59
6	26.1	26.7	44	
12	26.2	27	46	

3. If possible to tabulate responses, it would be useful to do so for the above listed questions by groups cited in (1) above.

Cereals

1. Group the questionnaires by region (Thies, Diourbel) and package (TB, TL, TBFF, groupement de production et artisans ruraux).

2. Tabulate the responses by these groups.

3. For USAID the most important questions are:

I 1	4	4	9	4
3	5	V 2	VII 1	
8	IV 1	VI 1	2	
II 2	3	6	3	

4. VI 1 and 3 - prepare a list, by village of groups in the village and the type of membership, i.e. men, women, etc.

5. VIII 1 and 2 - As part of the final report prepare a list of the needs not satisfied by the project.

Health

1. The questions of highest priority for USAID are:

<u>A.</u> 1	13	27	<u>AM</u> 35
<u>H.</u> 4	13 bis	29	36
<u>Ut.</u> 10	15	30	<u>Dev</u> 37
11	19	<u>I.</u> 32	
12	<u>S.</u> 23	34	

Bakel Small Irrigated Perimeters

1. Group the questionnaires by ethnic groups (Sarakoles and Toucouleurs).

2. Tabulate response to questions by these groups.

3. The questions of highest priority for USAID are:

3	14 a,b	34 a,b
7	17	37 a,b
8	21	40
11 a,g	31 a,b	
12	32	
13	33	

The questions of secondary priority are:

2	20	29
6	22	35
16	24	38
18	28	39

4. The sum of questions listed in 3 above are those chosen by ENEA for tabulation.

Calendar of Activities of Joint Assessment

<u>Date(s)</u>	<u>Event</u>
<u>1979</u>	
Oct. 19	David Shear arrives as Mission Director.
Nov. 9	Henry Miles AFR/DS/E develops first writing evaluation plan for a country evaluation.
<u>1980</u>	
Jan. 7-11	Abidjan Evaluation Conference -- development of idea of Joint Assessment.
Jan. 21	Axel Magnuson starts.
Jan. 23-25	Bob Berg PPC/E discusses joint assessment; develop general scheme of the assessment.
Jan. 31	Notified Washington - request funds.
Feb. 1	Formal start of Joint Assessment.
Feb. 4-8	First contacts with ENEA, hire staff, work with project managers.
Feb. 11	Claude Salem arrives.
Feb. 11-16	Develop detailed outline of assessment.
Feb. 22	First meeting with Malik Sow, Director of Planning.
Feb. 25	First meeting with Abdoulaye Nar Dieye, Deputy Director of Planning.
March 3-7	Work with Dieye on general plan of Joint Assessment.
March 7	First formal meeting with ENEA.
March 7-14	Jan Ennis, BUCEN visit.
March 7-April 4	Matt Seymour, DS/HRD TDY.
March 8	Notification of funding availability.
March 10	ENEA starts work on beneficiary survey.
March 12	Brief Ambassador and Embassy Staff on assessment.
March 17-31	Bakel Livestock evaluation undertaken.
March 24-April 11	Bakel Irrigation evaluation undertaken.
March 24-April 18	Bennet Impact/SSRH evaluation undertaken.
March 18-April 4	Elliot Berg to do macro-economic evaluation.
April 2	Mission review of Bakel Livestock evaluation.
April 10	ENEA teams into the field; all projects.
April 14	Mission review of Bakel Irrigation evaluation.
April 17	Mission review of Sine Saloum Rural Health evaluation
April 18	First note to Management Committee.
April 25	ENEA completes field work.
April 28-May 6	Jan Ennis here to work with ENEA.

Calendar of Activities of Joint Assessment - Page 2

<u>Date(s)</u>	<u>Event</u>
May 9	Review with GOS on Sine Saloum Rural Health.
May 12	USAID Joint Assessment workshop.
May 14	SODEVA review with the GOS.
May 23	Review with the GOS on Bakel Livestock and Bakel Irrigation.
May 26	Start drafting the final report.
May 27	Plenary meeting on Joint Assessment with the GOS.
May 27	First ENEA reports.
May 30	Brief U.S. Ambassador on results of assessment.
May 30	Initial meeting on final report.
June 3	Detailed report on ENEA findings.
June 3-4	Review of Final Report within Mission.
June 6	Final draft report and English annex finished.
June 9-30	Internal review of final report.
July 1	Final report prepared.
July 2-7	Review of final report with Ministry of Plan.
July 10	Meeting of Management Committee to approve Final Report and sign aide-memoire.