

NOTICE OF MEETING

TO: See Distribution
FROM: AFR/PD: Norman Cohen
MEETING: Senegal - Millett Transformation: PP Amendment

ISSUES
DATE: Dec. 19
TIME: 2-4 PM
PLACE: Room 2524

PS BRT 703
685-0250
12/18
[Handwritten initials]

AGENDA

The committee will review USAID/Senegal request for a \$400,000 LOP increase and a 26-month PACD extension for the Millet Transformation Project. It is not anticipated that an ECPR meeting will be necessary.

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Attachments:

PP Amendment
Project Evaluation

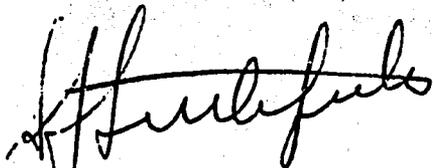
MILLET TRANSFORMATION
PROJECT PAPER SUPPLEMENT
(685-0250)

USAID/SENEGAL
DECEMBER, 1984

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

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USAID/Senegal submits the Project Paper Supplement
for the Millet Transformation Project (685-0250)
for AID/W review. Mission requests AID/W Delegation
of Authority (DOA 140) for field authorization.



S.J. Littlefield
Mission Director
USAID/Senegal

MILLET TRANSFORMATION (685-0250)
PROJECT PAPER SUPPLEMENT

| | <u>Page</u> |
|---|-------------|
| 1.0 Executive Summary and Recommendations | 1 |
| 1.1 Executive Summary | 1 |
| 1.2 Recommendations | 3 |
| 2.0 Project Background and Accomplishments | 3 |
| 2.1 Project Background | 3 |
| 2.2 Project Accomplishments | 4 |
| 3.0 Project Extension: Approach, Objective, Relationship to GOS and USAID Priorities and Project Elements | 5 |
| 3.1 Project Implementation Approach and Objective | 5 |
| 3.2 Relationship to GOS and USAID Strategy | 7 |
| 3.3 Project Elements | 7 |
| 4.0 Financial Aspects | 8 |
| 4.1 Expenditures and Additional Funding Requirements | 8 |
| 4.2 Benefits to be Derived from Provision of Additional Funding | 11 |
| 4.3 Procurement Implementation and Payment Method | 12 |
| 4.4 Justification of Payment Methods | 13 |
| 4.5 121d Determination and Audit Coverage Consideration | 13 |
| 5.0 Project Implementation Plan | 14 |

4

Annexes

| | | |
|---------|-------------------|----|
| Annex 1 | Project Data | 16 |
| Annex 2 | Economic Analysis | 17 |
| Annex 3 | Logical Framework | 20 |
| Annex 4 | Financial Tables | 22 |

Tables

| | | |
|---------|---|----|
| Table 1 | Authorized Budget, Expenditures and Balance as of 9/30/84 Bilateral Funds | 22 |
| Table 2 | Authorized Budget, Expenditures and Balance as of 9/30/84 Title III Funds | 22 |
| Table 3 | Estimated Long-Term Technical Assistance Cost/Year | 23 |
| Table 4 | Authorized Bilateral Budget, Proposed Increase and Total Life of Project Dollar Funding | 8 |
| Table 5 | Authorized Title III Budget, Proposed Change and Total Life of Project Local Currency Funding | 9 |
| Table 6 | Current Funding Level, Proposed Increase and Life of Project Funding by Source | 10 |

5

MILLET TRANSFORMATION (685-0250)
PROJECT PAPER SUPPLEMENT

1.0 Executive Summary and Recommendations

1.1 Executive Summary

1.11 Problem

Approval is required to:

- a) extend the PACD of the Millet Transformation project by 14 months through May 31, 1986;
- b) increase the Life of Project Bilateral Funding from 500 thousand dollars to 900 thousand dollars; and
- c) increase the level of Title III funding from 200.32 million FCFA to 248.5 million FCFA subject to approval by the GOS Title III management committee and the US Government DCC.

1.12 Background

The Millet Transformation project supports a series of research and development activities: (1) to determine the cultural acceptability, technical feasibility and economic viability of producing and selling processed millet foods; (2) to assist the Senegalese to develop illustrative manufacturing/marketing/financial plans for production/distribution of millet-based foods; and (3) to lay the groundwork for possible investment by the private sector or a public enterprise. An overall feasibility study which incorporates the findings of the various research and development activities/subsidies (i.e. food habits and attitudes, food product development and evaluation, food product marketing, financial analysis of industrial production and marketing, millet availability and constraints to industrial development) will be produced by the end of the project and made available to private food industries, potential investors and Senegalese government officials.

Thus far under the project, information has been obtained on food habits and attitudes; processing techniques have been developed and are being refined for several food products; and consumer reaction to various products is being evaluated. During the project extension the remaining substudies will be carried out and incorporated into a comprehensive feasibility study which will then be presented to potential investors, food industries and government officials.

Activities under the project began in September 1982 at Senegal's Food Technology Institute (Institut de Technologie Alimentaire, ITA) with the arrival of a food industry technical advisor recruited to provide guidance and assist in coordinating this effort. The project was evaluated in April 1984.

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It was considered to have a high probability of successfully achieving its objectives but was estimated to be at least a year behind the implementation schedule established in early FY 83. The major events which affected the rate of completion of project components are summarized below:

1. Food product development and evaluation activities were carried out primarily at ITA. The project paper had envisioned a greater portion of this work being conducted in the United States. However, ITA was judged by the technical assistance contractor to have sufficient expertise and facilities to take major responsibility for this component and could provide products that would be more acceptable to the Senegalese consumer than imported prototype foods. The food technologist also noted that the facilities for communications and shipping of prototype food products between US food laboratories and Senegal for evaluation and market tests were viewed unrealistically in the PP and could contribute greater delays than dependence on available Senegal facilities.
2. Although product development activities were conducted by ITA, the project had to rely on a private firm to produce sufficient quantities of prototype products for marketing tests. Several months were required to negotiate the use of these facilities and get unused production lines in operational condition.
3. Funding was provided from both bilateral and Title III local currency sources. Title III funds were used for ITA operating costs, improvement of ITA laboratories, procurement of commodities, financing of the various substudies contracted out to local firms and payment of salaries of ITA staff recruited to work on the project. Senegalese procedures and regulations were followed for all Title III funded expenditures. This resulted in delays in achieving the staffing levels and in establishing the facilities required for the project activities. The selection and awarding of contracts for substudies (i.e. millet availability and food product marketing) required several months to one year which was considerably longer than projected in the initial plan of work.
4. The PP implementation plan did not allow for adequate feedback and periodic modifications in food product development schedules based on the performance of various processing techniques. When certain equipment failed to meet anticipated performance the project officials were required to order alternate machines. Time required for identifying, shipping, installing and testing alternate equipment delayed the market tests of prototype foods.

1.13 Discussion

The project evaluation stressed the importance of conducting a comprehensive feasibility study, supported the decision taken to have ITA carry out product development activities and advised that a substudy be added on why previous efforts at millet processing in Senegal had failed. It also

recommended reducing the scope of project activities to primary transformed food products (i.e. flour, cracked grain and semolina) because of the uncertainty regarding the availability of equipment for processing couscous and the weaning food.

USAID/Senegal and ITA fully support the need for a comprehensive study. However, based on the potential for both the millet couscous and weaning food, USAID and the GOS officials agreed to continue development efforts on these products and allow more time to identify suitable equipment. Since the evaluation in April 1984 equipment has been located and substantial progress has been made in refining processing techniques for both couscous and the weaning food. USAID further proposes to delete the plant location substudy. Funding mechanisms to assist private food industries in conducting this study will be considered once the potential for millet processing has been established. GOS officials view this project as being extremely important within Senegal's overall development strategy.

1.2 Recommendations

1. That the PACD of the Millet Transformation project be extended through May 31, 1986;
2. That the Life of Project Funding be increased from 500 thousand dollars to 900 thousand dollars;
3. That Title III funds be increased from 200.32 million CFA to 248.5 million CFA subject to approval by the GOS Title III Management Committee and the US Government DCC.

2.0 Project Background and Accomplishments

2.1 Project Background

The Millet Transformation project authorization was signed in August 1981. Project activities started in September 1982 with the arrival of the technical assistance advisor and the preparation of the detailed implementation plan. After assessing the capabilities of the Food Technology Institute (ITA), including the qualifications of its personnel, equipment and facilities available, a work plan was developed by the technical assistance advisor in collaboration with ITA and submitted to USAID for approval. The implementation plan proposed a change in the approach envisioned in the original project design which reduced the food product development activities conducted in the United States with the expectation that food products derived from millet would have a greater chance of being accepted by the Senegalese consumer if developed in Senegal. It should be noted that the mid-term project evaluation supported the decision taken to have ITA do product development work, particularly for primary transformed products. The evaluation did, however, indicate that the technical capabilities of ITA may have been overestimated given the pace of work achieved in the project.

8

The above change in the approach to project implementation necessitated a revision of the Title III local currency budget to cover the costs of laboratory improvements, supplemental equipment purchase and recruitment of personnel by ITA. The Title III management committee agreed to the increased budget requested by ITA and additional funds were added to the project as required for the plan of work. ITA experienced serious delays putting into effect these changes due to the time-consuming procedures for obtaining necessary approvals required by the GOS in the administration of the local currency account. This was most evident in the selection of firms and awarding of contracts for the various substudies. Contracting for the food product marketing substudy required more than a year. In addition, the firm selected for the millet availability study proved to be inadequately qualified and did not produce a useful report.

In late 1982 the substudy of food habits and attitudes was eliminated after it was determined that sufficient information already existed in various recent studies. This decision was judged appropriate by the mid-term evaluation. The decision was also made within the first few months of the project to concentrate activities on basic food products (primary products of flour, cracked grain and semolina and secondary transformed products consisting of a weaning food, an instant couscous and one bakery product). Equipment needs for these products were identified and ordered. As the food product development activities progressed it became apparent that some of the equipment initially purchased did not meet expectations and project needs. The time required for the identification and ordering of alternate equipment delayed the completion of product development and market tests.

Problems in the production of adequate quantities of primary transformed food products for market tests contributed to delays in implementation as several months were required to get the processing lines of the local flour mill in proper condition. Other factors affecting implementation included difficulties in purchasing sufficient quantities of millet for market tests due to governmental marketing restrictions, resignations of key ITA project personnel, changes in project directors by the firm carrying out the marketing study and inadequacies in logistical support caused by ITA administrative procedures.

2.2 Project Accomplishments

The project was evaluated in April 1984 and judged to have made considerable progress in two key areas, food product development and test marketing. Consumer reaction to millet flour, cracked grain and semolina had been assessed with small groups and found to be highly favorable. Significant progress had been achieved in the development of a weaning food, instant couscous and bakery products at a laboratory scale. Packaging materials had been successfully tested for all products and nutritional analysis conducted for the weaning food. Households had been selected for the marketing substudy and questionnaires were being developed.

The project evaluator estimated that the project was one year behind schedule. He recommended that the scope of the project be reduced to carrying out a comprehensive study on only the primary transformed products. This was based primarily on the uncertainty as to whether or not processing techniques could be refined for secondary transformed products (i.e. couscous and weaning food) and appropriate equipment identified for producing sufficient quantities of these products for market tests.

ITA and USAID/Dakar both believe that a feasibility study of only primary transformed products would be less likely to attract investment capital to initiate a millet-based food industry in Senegal than a study including selected secondary transformed products (i.e. instant couscous, instant weaning food and bakery products). The weaning food has potential to provide a nutritious affordable product to a segment of the population which is unable to afford fortified weaning foods currently on the market. The importance of couscous in the Senegalese diet makes it a strong competitor with imported wheat and rice should development efforts prove successful in achieving a staple instant couscous at an acceptable cost. The ITA staff and technical assistance specialist have high expectations for the processes they are working with in developing this product.

Based on the decision to continue with the small number of primary and secondary products, ITA ordered the necessary equipment and conducted further experiments on both couscous and weaning foods. Transformation processes have been refined for both of these products. A marketing study has been carried out in 250 households for primary transformed products and the results are being analyzed. Several products are currently being tested at an international trade fair in Senegal. Packaging has been selected for market tests of the weaning food. The firm conducting the marketing substudy has assigned a new project director and has revised the schedule for completing this study based on the current status of product development. USAID estimates that a comprehensive feasibility study can be carried out for primary and secondary transformed products by May 31, 1986. This represents a 20 month extension from the original PACD of September 30, 1984. USAID has already extended the PACD through March 31, 1985. The additional extension required is therefore 14 months.

3.0 Project Extension: Approach, Objective, Relationship to GOS and USAID Priorities and Project Elements

3.1 Project Implementation Approach and Objective

The proposed extension will allow for the completion of a comprehensive feasibility study of the potential for the manufacture and marketing of millet-based food products in Senegal for a small number of primary and secondary food products. The results will be shared with food manufacturers, potential investors and the government of Senegal officials to attract investment capital. During project implementation several mechanisms are also being used to assure that the needs of the above interested parties are

adequately addressed. A project advisory committee, consisting of representatives from food industries, GOS and USAID officials and potential investors, was established under the project as planned for in the PP. As the project initiates supplemental feasibility substudies this committee will meet on a regular basis to provide suggestions to project officials and monitor the progress of project activities. Frequent discussions with Senegalese, US and other donor industries will continue to provide input into the overall feasibility study. Several industries based in Senegal have already worked closely with ITA during the product development phase and have indicated their interest in continued collaboration. Linkages will be established with Project SUSTAIN (1) and the US commercial/economic office in Dakar to promote the industrial applications of the feasibility study on millet transformation. Commercial officers of other embassies, business delegations visiting Senegal and international financial institutions will be informed of the potential for a millet processing industry in Senegal.

The technical assistance firm will backstop the resident advisor and ITA, facilitate contacts with US food industry and suppliers of equipment and raw materials, obtain required information to allow for the overall feasibility to be assessed, provide consultants, purchase remaining equipment and arrange for analysis of products sent to the US. To assure that a high quality, comprehensive feasibility study is produced, USAID/Senegal proposes that the technical assistance firm be given greater responsibility in defining specific terms of reference for the substudies working closely with industry officials, in identifying and selecting the most appropriate mechanisms for carrying out these analyses and in monitoring their implementation. The TA firm is also responsible for incorporating findings of the various substudies into the overall feasibility report and assisting ITA in presenting this information to interested parties.

(1) AID/W funded project "Sharing U.S. Technology to AID in the Improvement of Nutrition". Joint effort by U.S. food companies and USAID to up-grade food processing companies in developing countries.

The substudies to be carried out are briefly described below:

Millet Availability: will evaluate the potential demand and supply for millet considering several aspects: the effect of population growth and change in dietary preferences on demand; the effect of rainfall and other variables on production; post-harvest handling and storage factors and the impact of GOS policies on marketing and production. Recommendations will be provided on a complete strategy to enable an efficient system for millet transfer from the producer to the processor.

Financial Analysis: will assess the potential financial viability of a business enterprise in Senegal for the manufacture and distribution of millet-based food products. Factors to be considered include the potential revenue to be generated from product sales, the projected costs of operation including manufacturing, selling and other business expenses, the estimated capital requirements, potential profitability and return on investment. This study will be a basis for further examinations by potential investors, private industry and GOS officials.

Industrial Constraints: will review the business and investment climate in Senegal and previous failures in millet processing and provide recommendations to GOS policy makers to enhance the development and growth of millet food products in the urban centers. This study was added based on the evaluation recommendation and requests by ITA.

USAID recommends that the plant location substudy be deleted as it is premature to conduct such an analysis. Funding mechanisms for this study will be reconsidered once the feasibility for millet processing has been established and food industries demonstrate their interest in exploiting the industrial applications of this research.

3.2 Relationship to GOS and USAID Strategy

USAID and the Government of Senegal continue to maintain a high priority on increased consumption of locally produced cereals grains including millet and the reduction of imported food grains. USAID believes that the techniques for millet transformation developed during the course of this project also have potential applicability to other countries where millet is a major staple food.

3.3 Project Elements

The funds provided as part of this project extension will finance the following items:

1. The provision of the technical assistance advisor through the end of the project and the technical backstop of the TA firm.
2. The purchase of equipment for the weaning food and couscous product development activities.

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12

3. The substudies of millet availability, financial analysis and industrial constraints.

4. The sponsorship of a seminar at the end of the project to present the findings to industry, GOS officials and potential investors.

4.0 Financial Aspects

4.1 Expenditures and Additional Funding Requirements

Authorized budgets and expenditures for bilateral and Title III local currency funded components are given in Annex 4, Tables 1 and 2. The additional bilateral and Title III funding requirements along with proposed modifications in which elements will be funded from bilateral funds versus Title III local currency are presented in Tables 4 and 5 below.

Table 4
Authorized Bilateral Budget, Proposed Increase
and Total Life of Project Dollar Funding (\$1,000)

| <u>Budget Item</u> | <u>Authorized Budget</u> | <u>Proposed Increase</u> | <u>Total LOP Funding</u> |
|--|--------------------------|--------------------------|--------------------------|
| 1. Technical Assistance | 416 (a) | 227 (b) | 643 |
| 2. Equipment | 84 | 50 (c) | 134 |
| 3. Studies on millet availability, financial analysis and industrial constraints | 0 | 87 (d) | 87 |
| 4. Seminar to present findings to food industries, potential investors and GOS officials | 0 | 10 | 10 |
| SUB-TOTAL | <u>500</u> | <u>374</u> | <u>874</u> |
| 5. Contingency (7%)(e) | 0 | 26 | 26 |
| TOTAL | <u>500</u> | <u>400</u> | <u>900</u> |

(a) Authorized budget corresponds to amounts in Technical Assistance Contract and includes consultants and resident advisor costs.

(b) Calculation of proposed funding increase for TA is given in Annex 4 table 3.

(c) These funds will be used to purchase a flour mill required for the couscous and weaning food product development work.

(d) All substudies originally budgeted under Title III funds with the exception of product development and marketing will be funded from dollar funds to enable the selection of a contractor who has the required qualifications to produce a quality study.

(e) Contingency calculated only on proposed LOP funding increase.

Table J
**Authorized Title III Budget, Proposed Change and
 Total Life of Project Local Currency Funding (1,000 FCFA)**

| <u>Budget Item</u> | <u>Authorized Budget</u> | <u>Proposed Change</u> | <u>Total LOP</u> |
|------------------------------|------------------------------|----------------------------|----------------------|
| Local Contracts | 77,000 | -37,000 (a) | 40,000 |
| Raw Materials | 16,500 | +30,500 | 47,000 |
| Resident Advisor | 24,000 | -11,500 | 12,500 |
| Consultants | 4,500 | +2,100 | 6,600 |
| Equipment/Investments | 29,000 | +11,000 | 40,000 |
| Personnel (ITA) | 19,900 | +34,700 | 54,600 |
| Travel | 3,000 | +2,000 | 5,000 |
| Documentation | 500 | +0 | 500 |
| Fuel, Vehicle Repair | 6,500 | +400 | 6,900 |
| Office Supplies | <u>2,000</u> | <u>+2,800</u> | <u>4,800</u> |
| SUB-TOTAL | 192,900 | +35,000 | 217,900 |
| Contingency/Inflation | <u>17,420</u> | <u>+13,086</u> | <u>30,506 (b)</u> |
| TOTAL | 200,320 | +48,086 | 248,406 |

Title III LOP funding requirements are rounded to 248,500,000 FCFA. The increase in the Title III budget is 48,180,000 FCFA.

(a) Remaining substudies with the exception of the product development and marketing studies will be funded under the bilateral budget. Therefore, this line item has been decreased.

(b) 7% contingency and 7% inflation based on total LOP funding requirement.

The Government of Senegal contribution during the period October 1, 1984 thru May 31, 1986 includes the local currency from Title III and in-kind costs (i.e. personnel not funded by Title III; office and laboratory facilities; equipment; overhead costs including utilities, telephone and maintenance). In-kind costs during the project extension are estimated at the equivalent of \$118,000. The total GOS contribution of in-kind costs for the project is estimated at the equivalent of \$305,000.

14

Table 6
**Current Funding Level, Proposed Increase
 and Life of Project Funding by Source (\$1,000)**

| <u>Funding Source</u> | <u>Current Funding</u> | <u>Proposed Increase</u> | <u>LOP Funding</u> |
|-----------------------|--------------------------------|-------------------------------|-------------------------------|
| USAID Bilateral | 500 | 400 | 900 |
| GOS Title III (a) | 572 (200.32 million CFA) | 138 (48.18 million CFA) | 710 (248.5 million CFA) |
| GOS In-Kind | 187 | 118 | 305 |

(a) Title III funds were converted to their dollar equivalent at an exchange rate of 350 FCFA/dollar. The exchange rate has varied greatly during the life of the project from approximately 275 to 475 CFA/dollar.

15

4.2 Benefits to be derived from Provision of Additional Funding

The extension of this project and provision of additional funding will allow for the completion of the substudies leading to a comprehensive feasibility study for the establishment of a millet-based food industry in Senegal and the presentation of findings to food industries, potential investors and GOS officials. The chart shown below outlines the progress to date and the activities/events which will occur during the extension period.

| Substudy | Progress | Planned |
|---------------------------------|--|---|
| Food habits and attitudes | Study cancelled based on availability of recent studies. Information verified with household marketing studies. | None |
| Food product development | Processing techniques developed and refined for flour, cracked grain and semolina. Processing techniques developed for weaning food, couscous and bakery products. Successful tests conducted on shelf-life of products and nutritional aspects of weaning food. | Further refine processing techniques for couscous and weaning food. |
| Food product marketing | -Initial consumer reaction tests conducted on all prototype food products. Household marketing tests carried out for flour, cracked grain and semolina. -Conduct marketing tests for couscous and weaning food at international trade fair. | -Carry out marketing tests at retail market level for all prototype products. Identify packaging requirements and marketing strategy. |
| Millet Availability | Study conducted but judged to be of unacceptable quality. | Carry out additional study. |
| Financial Analysis of industry | None | Carry out study. |
| Industrial Constraints | None | Carry out study. |
| Comprehensive Feasibility Study | Information obtained from product development and marketing studies. | Carry out study when all substudies are complete. Present findings to industry, investors and GOS officials |

16

The project paper discusses the social and economic benefits to be derived from attracting a millet processing industry to Senegal. The social analysis is still valid. A revised economic analysis is presented in Annex 2 based on the increased funding requirements. This analysis, which shows substantial potential gains as a result of this project, looks at only the benefits to be obtained from a reduction in importation of cereals grains by expanding the demand for millet food products. Many other benefits will be derived from this project, including strengthening ITA's capability as a research institute, enhancing nutritional status, and potential positive impact in the agricultural sector. Many of the benefits will apply to other countries where millet is an important staple food.

4.3 Procurement Implementation and Payment Method

| <u>Item</u> | <u>Method of Implementation</u> | <u>Method of Payment</u> | <u>Amount (\$000)</u> |
|----------------------|---|--------------------------|---------------------------|
| Technical Assistance | AID/W contract with TA firm | USAID Direct | 227 |
| Equipment | Purchased by TA firm | USAID Direct | 50 |
| Studies | AID Direct Contract with IQC firm or PSC | USAID Direct | 87 |
| Seminar | USAID issued purchase orders and invitational travel orders | USAID Direct | 10 |
| Contingency (7%) | | | <u>26</u> |
| TOTAL | | | 400 |

4.4 Justification of Payment Methods

Technical Assistance: Long and short-term technical assistance will be provided by Experience Incorporated which has the current TA contract. The project manager will directly review all vouchers and supporting documentation and provide administrative approval prior to payment.

Equipment: The technical assistance firm will be authorized to purchase equipment needed under the project. The project manager will review these expenditures as part of the voucher submission by the TA firm.

Studies: USAID will issue contracts with IQC firms or individuals to carry out the various studies in this project. The TA firm, ITA and USAID will review all proposals submitted, jointly select a contractor and agree on the amount of funds which can be expended for a given study. USAID will use the direct method of payment for these studies. The project manager will review all vouchers and supporting documentation and provide administrative approval prior to payment.

Seminar: Costs associated with sponsoring a seminar to present the findings of this project to appropriate GOS officials, companies and agencies will be funded under a direct payment procedure. Allowable costs will be defined in an implementation letter. The project manager will review all vouchers and supporting documentation and provide administrative approval prior to payment.

The USAID/Senegal Regional Controller has reviewed the procurement implementation plan and method of payment and is in concurrence.

4.5 121d Determination and Audit Coverage Consideration

The Millet Transformation project was granted a negative FAA 121d determination by AFR/SWA. No bilateral funds will be handled by the host government under the project extension. Therefore no further 121d certification is required.

Expenditures under the technical assistance contract are subject to audit by the DCAA or other federal auditors. Other bilateral funded expenditures are subject to audit by the IG based in Senegal. No specific audit is programmed as part of the project extension.

The PL 480 local currency management commission will conduct a routine Government of Senegal audit prior to final disbursement.

5.0 Project Implementation Plan

The following implementation plan is proposed:

- | | |
|----------------|---|
| November 1984 | <ul style="list-style-type: none"> -Continue food product development activities on secondary transformed products -Complete analysis of household marketing survey for primary transformed products -Purchase millet and packaging materials for marketing substudies -Order remaining equipment |
| December 1984 | <ul style="list-style-type: none"> -Obtain AID/W approval of PP supplement -Sign grant agreement amendment for bilateral and Title III funding increase -Extend technical assistance contract -Evaluate consumer reaction to secondary products at international trade fair |
| January 1985 | <ul style="list-style-type: none"> -Install and test equipment for couscous and weaning food -Finalize report on household market tests for primary products |
| February 1985 | <ul style="list-style-type: none"> -Conduct market tests for primary transformed products |
| April 1985 | <ul style="list-style-type: none"> -Finalize report on market tests for primary transformed products -Prepare TOR and RFP for millet availability substudy |
| June 1985 | <ul style="list-style-type: none"> -Prepare TOR and RFP for financial analysis substudy -Select firm for millet availability substudy -Prepare TOR and RFP for substudy on industrial constraints |
| July 1985 | <ul style="list-style-type: none"> -Initiate millet availability substudy -Begin test marketing for secondary transformed products -Select firm for financial analysis substudy -Select firm for substudy on industrial constraints |
| September 1985 | <ul style="list-style-type: none"> -Finalize millet availability substudy -Analyze results of test marketing for secondary transformed products -Initiate financial analysis substudy -Initiate substudy on industrial constraints |
| October 1985 | <ul style="list-style-type: none"> -Finalize report on market tests for secondary transformed products -Finalize financial analysis substudy |

December 1985

- Begin preparation of overall feasibility report
- Finalize report on product marketing

February 1986

- Present draft of overall feasibility report to USAID and GOS

March-May 1986

- Prepare final overall feasibility report and hold seminars/meetings with industry representatives, potential investors, GOS officials and donor agencies to present the findings

May 1986

- Conduct final project evaluation

70

ANNEX 1 - PROJECT DATA

| | |
|------------------------------------|-----------------------|
| Project Number | 685-0250 |
| Project Title | Millet Transformation |
| Date Project Authorized | July 31, 1981 |
| Date Original Agreement | September 22, 1981 |
| Original PACD | September 30, 1984 |
| Amended PACD | March 31, 1985 |
| LOP Bilateral Funding | \$ 500,000 |
| Title III Funding (initial) | 130,320,000 FCFA |
| Title III Funding (first revision) | 200,320,000 FCFA |
| Proposed New PACD | May 31, 1986 |
| Proposed LOP Bilateral Funding | \$ 900,000 |
| Proposed LOP Title III Funding | 248,500,000 FCFA |

ANNEX 2 - ECONOMIC ANALYSIS FOR THE PP SUPPLEMENT OF THE MILLET TRANSFORMATION PROJECT

Section IV B of the Millet Transformation PP notes that it is not possible to undertake a standard cost benefit analysis of this project since it is a research and development effort and it is therefore impossible to predict to what extent research will achieve the desired result.

One can assume that the research will lead to applicable results and see then what would be the benefit to cost ratios. There are several benefits that can be expected from this project (see project paper) but the most easily measurable one is the impact on balance of payment that would be obtained if Senegalese were shifting part of their rice consumption to processed millet. We will therefore limit our cost/benefit analysis to the foreign exchange savings generated by this project, from the point of view of the country as a whole. On the benefit side we find the reduction in rice consumption and therefore in rice imports.

On the cost side, we must take into consideration the impact of an increase in millet production on peanut production: since the land available for cultivation is a limited resource, an increase in millet production can be obtained from two sources:

- an increase in the productivity of millet fields.
- an increase in land area devoted to millet production with a resultant decrease in the areas planted with peanuts.

Another cost to be taken into consideration is the foreign exchange cost of the investment in a millet transformation factory.

Major Assumptions:

- The assumption of 50,000 T millet processed per year will be maintained, but the production unit will reach that level in 5 years as follows:

| <u>Year</u> | <u>Production</u> |
|-------------|-------------------|
| 1 | 10,000 |
| 2 | 20,000 |
| 3 | 30,000 |
| 4 | 40,000 |
| 5 | 50,000 |

22

After that period, production will remain stable at 50,000 tons per year.

- The costs and benefits will be computed on a 10 year period.
- 2/3 of the increase in millet production will come from a shift from peanuts to millet, 1/3 will come from increase in productivity.
- If additional tonnage of millet for cash sales have to be produced, this will be done with more intensive farming technique than that used for millet at present time. In particular fertilizer will be applied. The average millet yield over the last five years has been 472 kg per ha. We will assume that fertilizers increase the yield by 50% to 708 kg per ha.
- The FOB price of peanut oil is estimated to be \$ 750/ton.
- The CIF price of 100% broken rice is \$ 250/ton.
- The foreign exchange cost of the millet transformation factory is estimated at \$2 million, which will be spent in year 1.
- We will assume that the increased foreign exchange spending in terms of fertilizer is marginal compared to the other costs and benefits.

Detail of the Computation:

a) Cost:

- 10,000 additional tons of millet produced represent 14,124 hectares planted with an assumed yield of 708 kg per ha.
- 2/3 of this area is obtained by a reduction in the areas planted in peanuts i.e. 9,322 hectares.
- 9,322 ha of peanuts represent 6,702 tons of peanuts if we take the average yield over the last 5 years (719 kg/ha).
- We assume that 75% of the production of peanut is transformed into oil:
 $6,702 \text{ t} \times 75\% = 5,026 \text{ t}$.
- 1 ton of peanuts in shell gives 340 kg of crude oil, therefore the loss in oil production generated by an additional millet production of 10,000 tons is 1,709 tons.
- At \$ 750 per ton FOB the loss can be evaluated at \$ 1,281,750.

b) Benefit:

- 10,000 tons of millet represents about 7,500 tons of semolina.
- 1 kilo of millet semolina represents 320 calories, 1 kilo of broken rice is 356 calories (based on "Food composition table for use in Africa" a research project sponsored jointly by FAO and US Department of Health, Education and Welfare, 1968). Therefore, if we take only this criterium of comparison of both products, 1 kilo of millet semolina is equal to about $\frac{320}{356}$ kilo of rice i.e. 0.899 kilo of rice
- Therefore 7,500 tons of millet semolina have the same nutritive value as 6,742 tons of rice.
- If one ton of 100% broken rice is valued at \$ 250, the benefits in terms of balance of payment savings generated by producing 10,000 tons of millet is $6,742 \times 250 = \$ 1,685,500$.

Therefore for each 10,000 additional ton of millet produced the balance of payment saving is: $1,685,500 - 1,281,750 = \$ 403,750$.

If we assume that the production of processed millet will start the year following the end of the project we have the following table of costs and benefits.

| <u>Year</u> | <u>US\$</u> <u>Costs</u> | <u>Benefits</u> |
|-------------|-----------------------------|-----------------|
| 0 | 1,915,000* | 0 |
| 1 | 2,000,000 | 403,750 |
| 2 | | 807,500 |
| 3 | | 1,211,250 |
| 4 | | 1,615,000 |
| 5 | | 2,018,750 |
| 6 | | 2,018,750 |
| 7 | | 2,018,750 |
| 8 | | 2,018,750 |
| 9 | | 2,018,750 |
| 10 | | 2,018,750 |

With these figures the internal rate of return is 32.8 % and the Net Present Value with a discount rate of 12% is \$ 4,466,755. These figures must be taken with extreme care, since as indicated earlier, the probability of success of the research has not been incorporated. The only thing these IRR means is that, should the research lead to the creation of a millet processing unit, with the production hypothesis retained here, from the point of view of the State, and looking at the balance of payments only, it would be a very interesting investment.

* Includes \$710,000 in Title III costs (248.5 million CFA with exchange rate of 350 CFA/dollar) \$900,000 in bilateral funds and \$305,000 in-kind costs provided by GOS.

It should also be noted that at least part of the investment in terms of equipment will still be available for the research by ITA after the end of this project.

74

Life of Project: 1.9 million
From FY 81 to FY 86
Total US Funding 0.9 million
Date Prepared 12/84

Project Title & Number: Millet Transformation Project - 685-0250

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|---|--|--|
| <u>Program or Sector Goal:</u> The broader objective to which this project contributes: | !Measures of Goal Achievement | ! | !Assumptions for Achieving goal targets: |
| Demonstrate that Senegal's balance of payments and food grain production can be potentially improved through substitution of nutritious, acceptable, reasonably priced millet-based foods for some imported rice and wheat foods | !Commitment by qualified investor (s) subject to final feasibility evaluation and GOS permission, to undertake pilot operation of factory (ies) and sale of millet-based foods to be consumed at least partially as replacements for imported rice and wheat | !1. Private financed final feasibility analyses !2. Application to GOS for investment authorization | !An entrepreneur or public enterprise will take up the plan developed through the project and successfully implement it |
| <u>Project Purpose:</u> | !Conditions that will indicate purpose has been achieved: !End of project status: | ! | !Assumptions for achieving purpose: |
| To establish the cultural acceptability technical feasibility and economic viability of producing and selling transformed millet foods so as to enable development of a manufacturing marketing/financial plan to help the Senegalese attract investment capital and induce the production and distribution of transformed millet foods | !Issuance of an integrated package of feasibility studies to acceptable commercial standards demonstrating on the basis of included action programs that millet-based processed foods are technically sound, can be manufactured and sold profitably, and can significantly replace rice and wheat in the diets of the Senegalese | !Review of the studies by a project evaluation team | !The potential market for transformed millet products is of substantial size and can be penetrated to an important degree; (e.g. in the volume equivalent of 10% or more of wheat and rice or up to 50,000 metric tons per year during a period of 10 - 20 years |

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORKLife of Project: 1.9 million
From FY 81 to FY 86
Total US Funding 0.9 million
Date Prepared 12/84

Project Title & Number: Millet Transformation Project - 685-0250

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|--|---|--|
| Outputs: | Magnitude of Outputs | | Assumptions for achieving Outputs: |
| 1. Food habits and attitudes substudy | 1. Study/action program on each of the six cited subjects | Reviewing the studies | Study methodologies are adequate to produce reasonably significant results in admittedly difficult and uncertain areas |
| 2. Action program to determine potential characteristics of one or more transformed millet products and their manufacturing procedures, and validation of marketability | | | |
| 3. Strategies for marketing and distribution of the products | | | |
| 4. Millet availability substudy including procurement strategy | | | |
| 5. Financial analysis substudy | | | |
| 6. Industrial Constraints | | | |
| Inputs: | Implementation Target (Type and Quantity): | | Assumptions providing inputs |
| 1. USAID - Technical Assistance Funding | \$900,000 grant for technical assistance, equipment and materials for ITA, and studies on millet availability, financial analysis and industrial constraints | Grant document and funding disbursement | 1. Availability of AID and GOS funding |
| 2. GOS - PL 480 Title III local costs for procurement of materials and supplies and for study contracts | \$710,000 (248.5 million FCFA at 350 CFA/dollar) local currency costs | PL 480 Title III disbursement records | 2. Availability to attract and hold satisfactory personnel |
| 3. GOS - Product development facilities and personnel and ITA contracting services; ITA overhead expenses | Scientific and Technical personnel and 44 months use of ITA laboratory facilities; \$305,000 direct and indirect costs | ITA accounting records; contracts for studies | |

ANNEX 4

Table 1
 Authorized Budget, Expenditures and Balance as of 9/30/84
 Bilateral Funds (\$)

| Budget Item | Amount Authorized | Expenditures | Balance |
|-----------------------|----------------------|----------------|---------------|
| Salaries | 157,147 | 147,346 | 9,801 |
| Travel/Transportation | 18,600 | 14,912 | 3,688 |
| Per Diem | 22,500 | 14,623 | 7,877 |
| Allowances | 27,700 | 16,333 | 11,367 |
| Equipment/Materials | 83,585 | 60,480 | 23,105 |
| Other Direct Costs | 11,260 | 12,422 | -(1,162) |
| Overhead | 143,708 | 134,576 | 9,132 |
| Fixed Fee | <u>35,500</u> | <u>30,349</u> | <u>5,151</u> |
| TOTAL | 500,000 | 431,041 | 68,959 |

Table 2
 Authorized Budget, Expenditures and Balance as of 9/30/84
 Title III Funds (1,000 FCFA)

| Budget Item | Amount Authorized | Expenditures | Balance |
|-----------------------|----------------------|---------------|----------------|
| Local Contracts | 77,000 | 12,551 | 64,449 |
| Raw Materials | 16,500 | 9,181 | 7,319 |
| Resident Advisor | 24,000 | 6,053 | 17,947 |
| Consultants | 4,500 | 3,629 | 871 |
| Equipment/Investments | 29,000 | 20,410 | 8,590 |
| Personnel (ITA) | 19,900 | 18,298 | 1,602 |
| Travel | 3,000 | 29 | 2,971 |
| Documentation | 500 | 102 | 398 |
| Fuel, vehicle repair | 6,500 | 5,713 | 787 |
| Office Supplies | 2,000 | 2,559 | -(559) |
| Contingency | <u>17,420</u> | <u>9,083</u> | <u>8,337</u> |
| TOTAL | 200,320 | 87,608 | 112,712 |

27

CONTINUATION OF ANNEX 4

Table 3
 Estimated Long-Term Technical Assistance Cost/Year*

| Item | Amount (\$) |
|--|-------------|
| A. Salary | 55,000 |
| B. Transportation (one round-trip from Dakar, Senegal to Washington DC) | 2,000 |
| C. Post Differential (15%) | 8,250 |
| D. Defense Base Insurance (4.64) | 2,552 |
| E. FICA, Medicare (8.40% of \$39,600) | 3,326 |
| F. Overhead (118% of salaries) | 64,900 |
| TOTAL | 136,028 |

(*) Based on the extension of the current TA contract.

Monthly cost = \$136,028 : 12. Requirements equal monthly cost of \$11,336 X 20 months = \$226,713. Rounded up to \$ 227,000. Funds were switched from consultants and related line items under existing TA contract to cover costs of long-term TA from September 30 thru December 31, 1984. This amount will be returned to TA contract for original purpose when project supplement is approved and contract amended. Therefore, the budget calculation for long-term TA is based on a 20 month period (i.e. October 1, 1984 thru May 31, 1986).

Note: housing costs are funded from Title III funds.

Document 0926A

28