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**Policy Relevant Research on the Food
and Agricultural System in Senegal**

by

**Mark Newman, Eric Crawford and
Jacques Faye**

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SPECIAL NOTE FOR ISRA-MSU REPRINTS

In 1982 the faculty and staff of the Department of Agricultural Economics at Michigan State University (MSU) began the first phase of a planned 10 to 15 year project to collaborate with the Senegal Agricultural Research Institute (ISRA, Institut Sénégalais de Recherches Agricoles) in the reorganization and reorientation of its research programs. The Senegal Agricultural Research and Planning Project (Contract 685-0223-C-00-1064-00), has been financed by the U.S. Agency for International Development, Dakar, Senegal.

As part of this project MSU managed the Master's degree programs for 21 ISRA scientists at 10 U.S. universities in 10 different fields, including agricultural economics, agricultural engineering, soil science, animal science, rural sociology, biometrics and computer science. Ten MSU researchers, on long-term assignment with ISRA's Department of Production Systems Research (PSR, Département de Recherches sur les Systèmes de Production et le Transfert de Technologies en Milieu Rural) or with the Macro-Economic Analysis Bureau (BAME, Bureau d'Analyses Macro-Economiques) have undertaken research in collaboration with ISRA scientists on the distribution of agricultural inputs, cereals marketing, food security, farm-level production strategies and agricultural research and extension. MSU faculty have also advised junior ISRA scientists on research in the areas of animal traction, livestock systems and farmer groups.

Additional MSU faculty members from the Department of Agricultural Economics, Sociology, Animal Science and the College of Veterinary Medicine have served as short-term consultants and professional advisors to several ISRA research programs.

The project has organized several short-term, in-country training programs in farming systems research, agronomic research at the farm-level and field-level livestock research. Special training and assistance has also been provided to expand the use of micro-computers in agricultural research, to improve English language skills, and to establish a documentation and publications program for PSR Department and BAME researchers.

Research publications from this collaborative project have been available only in French. Consequently, their distribution has been limited principally to West Africa.

In order to make relevant information available to a broader international audience, MSU and ISRA agreed in 1986 to publish selected reports as joint ISRA-MSU International Development Paper Reprints. These reports provide data and insights on critical issues in agricultural development which are common throughout Africa and the Third World. Most of the reprints in this series have been professionally edited for clarity; maps, figures and tables have been redrawn according to a standard format. All reprints are available in both French and English. A list of available reprints is provided at the end of this report. Readers interested in topics covered in the reports are encouraged to submit comments directly to the respective authors, or to Dr. R. James Bingen, Associate Director, Senegal Agricultural Research and Planning Project, Department of Agricultural Economics, Michigan State University, East Lansing, MI 48824-1039.

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**POLICY RELEVANT RESEARCH ON THE FOOD
AND AGRICULTURAL SYSTEM IN SENEGAL**

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Mark Newman, Eric Crawford and Jacques Faye

1987

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**POLICY RELEVANT RESEARCH ON THE FOOD AND
AGRICULTURAL SYSTEM IN SENEGAL**

ISRA MACROECONOMIC ANALYSIS PROGRAM 1984-1986*

Mark NEWMAN, Eric CRAWFORD, Jacques FAYE

July, 1984

I. INTRODUCTION

As part of the reorganization of Senegal's Agricultural Research Institute (ISRA) under the IDA/Government of Senegal Agricultural Research Project,¹ the Macroeconomic Analysis Bureau (BAME) was created in September 1982, with responsibility to carry out research on policy, prices, marketing and trade in the agricultural sector. The BAME is specifically assigned to:

1. Study the adequacy of farmer and herder incentives through income distribution studies, periodic reviews of input and output pricing, and through historical studies of elasticities;
2. Undertake marketing research on export and domestic crops and on possible new crops;
3. Evaluate the efficiency of marketing channels and determine appropriate margins.²

The rationale for setting up an agricultural policy research bureau directly responsible to the Director General of ISRA has been questioned. While the effectiveness and ability to assure access to decision-makers were given as reasons to place the BAME in the Ministry of Planning or the Ministry of Rural Development, two other factors were central in the decision to retain the BAME within ISRA:

*Not for citation without permission.

¹Project and Credit Agreement No. 1176 SE.

²World Bank. Senegal Agricultural Research Project Staff Appraisal No. 3073 SE August 19, 1981, p. 12.

1. A concern for a flexible administrative working environment that would attract and retain qualified personnel;³
2. The importance of close collaboration with ISRA's field research scientists to define and evaluate food and agricultural policy options.

Several proposals to link several government agencies with BAME activities in order to take advantage of mutual interests and expertise, and to assure access to government decision-makers are discussed below.

Since ONCAD was abolished in 1980 and the "Programme Agricole" suspended under "Plan de Réajustement" there has been a continuing debate over agricultural policies and the institutional system that should be set up or developed to implement them. This debate continues despite the important decision of the important interministerial council meeting in March-May, 1984 concerning the New Agricultural Policy (NPA). These decisions must be translated into concrete actions, policy options identified and implementation of the NPA evaluated. This will require the collection and analysis of a broad range of data and information, and as a research and policy analysis bureau, the BAME should be able contribute to this process.

Since its creation, BAME researchers have focused on defining a detailed plan of work for the period 1984/1986. Several BAME research programs that were already underway in ISRA (the socio-economics of traditional fishing, vegetable marketing in the Dakar and Casamance Regions), have continued, and researchers have started to compile bibliographies and undertake literature reviews.

International consultants assisted in identifying key research directions and the general approach for the BAME (Peterson, 1982; Crawford, 1982; Newman, 1983).⁴ A series of discussions with representatives from numerous governmental and international organizations in Senegal were also undertaken. On the basis of these missions and discussions a BAME proposed plan of work (BAME, Dec. 1983) was prepared, discussed in detail within ISRA and approved by ISRA's Scientific and Technical Committee. The

³Within the Senegalese governmental structure, ISRA is classified as an EPIC, or a Commercial and Industrial Public Institution thereby giving it a certain budgetary autonomy that is unavailable to other public institutions. The "Statut de Chercheur" or regulations concerning a researcher's status, currently under consideration would provide incentives to highly productive researchers.

⁴These consultant missions were part of the program under the ISRA/MSU/USAID Senegal Agricultural Research and Planning Project.

Plan of Work was subsequently distributed to interested government agencies and to certain foreign technical assistance organizations. Two separate meetings were organized by the Ministry of Scientific Research and Technology (MRST) in order to take full advantage of governmental and donor agency comments.⁵

Key issues raised in these discussions included:

1. Precise ranking of research priorities;
2. A clearer and realistic work plan, including a time table and specific technical and financial information;
3. An applied research orientation with adequate responsiveness to user needs;
4. The effective participation by governmental agencies in research program design and evaluation, and in some cases collaboration in research activities; and,
5. The creation of a "Consultative Scientific and Technical Committee" including representatives of the Ministry of Planning and Cooperation (MPC) and the Ministry of Rural Development (MDR) to provide guidance and evaluate research results.⁶

This paper represents the redesigned BAME Plan of Work for 1984/1986 and should serve as a starting point for the evaluation of BAME accomplishments. This presentation is organized as follows:

1. Section II presents key issues and central objectives of food and agricultural policy in light of the New Agricultural Policy (NPA) as discussed during the Interministerial Council Meetings of March, April and May, 1984;
2. Section III discusses the orientation and methodological approach of BAME research;
3. Section IV summarizes specific research programs including objectives, proposed procedures and expected outputs.

⁵The first meeting attending included governmental representatives from ISRA, PR/BOM, MPC, MDR, MCOM, MDIA, MRST, DAT, CSA, CPSP, Dir. de la Statistique, STN, SODESP, University of Dakar, ORSTOM, CSCE. Those attending the second meeting intended for representatives of donor agencies includes: Representatives of FAO, CCCE, USAID, German Fed. Rep. Embassy, MRST, MPC. The World Bank sent written comments.

⁶Representatives of MPC and MDR followed up on their oral comments at the meeting with a written note.

A timetable for research programs from 1984 to 1986 and a list of proposed working papers to be produced by each program are included as appendices.

II. TWO MAJOR OBJECTIVES OF SENEGAL'S NEW AGRICULTURAL POLICY

The evolution of Senegal's agricultural policy was discussed in an earlier BAME document (BAME, December 1983). Agricultural policy in Senegal has been a subject of considerable discussion recently, for several reasons:

1. The current economic crisis necessitates a careful evaluation of the costs and benefits of alternative agricultural policies;
2. Domestic cereals production during the disastrous 1983/84 agricultural season, following a decade of highly variable output, is expected to cover only 32% of the country's total cereals needs (estimated at 1,242 million metric tons) and;
3. With a population expected to approach 10 million by the year 2000 Senegal's cereals needs are expected to increase by almost 65% (to 2,043 million metric tons), thereby placing increased demands on agricultural input distribution, production, marketing and product distribution.

Four Interministerial Council meetings recently defined the components of New Agricultural Policy: presentation of NPA (March 26, 1984); the Caisse Nationale de Credit Agricole (CNCA), or the Agricultural Credit Bank (April 6, 1984); The Implementation of the New Agricultural Policy (April 16, 1984); and the Role of the Cooperative Movement (May 24, 1984).

The new policy is consistent with objectives of the VIe Plan and there is a strong emphasis on increasing farmer self-reliance (responsabilisation). The government's role is to be reduced to that of a catalyst or of providing incentives (NPA, p. 12).

Most major recent policy documents and discussions⁷ have focused on a set of priority concerns that require more in-depth analysis in order to facilitate informed decision-making. The central themes include:

1. Price Policy - the definition of a price policy that is consistent with the goals of national food self-sufficiency, food security (with accompanying nutritional and welfare implications) for the rural sector as well as urban consumers, and

⁷The VIe Plan Quadriennal de Développement Economique et Social, 1981/1985, the Plan d'Investissement Alimentaire 1977/1985, the Journées Nationales de Reflexion sur la Production Agricole et la Strategie Alimentaire 1983, the Plan Indicatif de la Recherche, and government statements in 1983 meetings with AID donors.

reduced costs of state intervention in the market. There is a limited understanding of supply and demand response to price and income elasticities. This understanding is important to the pursuit of government goals to increase domestic cereals production and consumption and to reduce rice and wheat imports.

2. Reform of the Regional Development Agencies - by reducing their intervention costs while improving their support for responsabilisation paysanne. The implementation of this reform requires an analysis of the options and tradeoffs concerning the appropriate functions and standards of performance of the RDAs.
3. Cooperatives - are to be reorganized to assume a larger role in grain marketing and input distribution. The successful implementation of this role will also require an analysis of the options and tradeoffs concerning the cooperatives' roles and support required to perform these roles.
4. Agricultural Credit - the development of a system that makes the necessary resources available to finance agricultural development while assuring debt reimbursement and long-term solvency of the credit system. The role of savings and methods of offering crop insurance and credit require analysis.
5. Seeds, Fertilizer, Agricultural Equipment and other Inputs - Assuring the timely availability of adequate and appropriate supplies of improved seeds, fertilizer and equipment. Analysis is needed of alternative distribution systems and related policies concerning pricing, licensing, etc.
6. Technical Recommendations - to assure that recommendations are both technically and economically sound concerning crop and variety selection, crop rotation, fertilizer use, mechanization, etc. This implies an improved understanding of actual costs of production by existing farming systems as well as an evaluation of alternatives.
7. Marketing - to assure outlets for agricultural products and supplies to consumers that satisfy policy objectives with respect to prices, quantities, timing, place and form. The improved understanding of the actual organization, operation and performance of the marketing system is an essential input into the evaluation of the roles for public, parastatal and private sectors (including cooperatives) in the agricultural marketing system.
8. Rural Constraints - identifying and decreasing farm level constraints on the achievement of national policy objectives, including constraints on rural

non-farm employment generation that have implications for migration and demands for government services in urban and rural areas.

9. Agricultural Statistics - an assessment of the quality and use of available agricultural statistics. The availability of viable and timely data on "what is" critical to the management and evaluation of the programs designed to achieve the governments agricultural policy goals.

The New Agricultural Policy presents a four part program to address the central themes listed above. Two parts of the program deal with institutions, cooperatives and RDAs. The others address input supply and storage. Specifically, they are:

1. Cooperative Reform and Revitalization. The notion of community solidarity is used as a critical element to assure production, consumption, savings and credit activities by "integrated cooperatives (and village sections)" that are subject to limited state intervention and that are responsible for a wide range of functions and products;
2. Extension and RDAs. The regional development agencies are to be reoriented and reorganized through a severe reduction in their personnel levels and redefinition of their mission; a limited and competent field staff is expected to respond to farmer requests for technical assistance rather than providing broad based extension of centrally determined technical recommendations. The ultimate goal is to disengage the government from agricultural production programs.
3. Inputs. The NPA encourages the improved supply of factors of production (fertilizer, seed and equipment) to the rural population through more adequate financing and more efficient management.
4. Stocks and Storage. Losses during production and post-harvest storage are to be controlled through improved pest control and stock protection measures.

Under the new policy, the process of responsabilisation or self-reliant development will focus on producers both as individuals and as member of village cooperatives. The cooperatives are to take over an increasing share of responsibilities that have historically been assumed by the government. Essential to the success of this initiative, according to the NPA, are: access to credit and assurance of debt repayment to the CNCA; assurance that a market for local cereals provides a permanent outlet to stimulate increased production; and the use of stocks to regulate cereals availability. Other elements of the new policy call for increased industrial transformation of local cereals and the achievement of 75% food self-sufficiency by the year 2000.

III. ORIENTATION AND METHODOLOGY OF BAME RESEARCH

The central objective of the BAME research program is to improve the knowledge base available for those responsible for guiding and managing Senegal's food and agricultural system toward desired policy objectives. Such knowledge is as important to effective policy making as political and economic power.

3.1 Principal Research Themes

The research program will emphasize specific descriptive and diagnostic studies and identify and evaluate policy options and tradeoffs. The program is organized along three themes:

1. The Economics of Agricultural Production, including the distribution and use of inputs and the adoption of improved technologies. Studies in this area will focus on the cost and returns of alternative farming systems and the economics of input distribution;
2. Marketing, including the organization, operation and performance of specific commodity subsectors, with attention to both domestic and international markets for food and agricultural products. Programs in this area focus on grain, livestock, fish and vegetable marketing on a regional and national basis;
3. The Food Security Situation, including supply and demand, balances, strategies for achieving food security, national food stocks, analysis of consumer demand, etc.

The studies under each research theme have started by reviewing past research and describing "what is". This will be followed by the appraisal of performance, the diagnosis of constraints and the evaluation of policy options in a broad food systems context.

3.2 Policy Analysis in a Food and Agricultural System Context

Policy choices are made in a dynamic environment where both the intended and unintended consequences of individual choices are affected by interdependence in the food and agricultural system. Hence, to evaluate the options and potential impacts flowing from a policy choice, (vis-a-vis inputs, technical advice, prices, organization of markets, consumption choices, etc.), it is important to identify and evaluate the links among food system participants. These participants include input distributors, producers, assemblers, those involved in product transformation, wholesalers, retailers, consumers and domestic and international policy makers. Input supply procedures, production

choices, marketing options and price for one commodity often have a major impact on the supply and demand for other commodities. Links between micro-level participants and overall macroeconomic performance are also very important to understand.

The activities of food system participants who perform different functions are linked both vertically and horizontally. This affects the degree to which intended policy signals lead to desired performance. For example, if valid information on prices and production and marketing costs in different locations is freely available, producers, traders and consumers (and policy makers) may be expected to make different decisions than if such information is costly to acquire and of questionable validity. The absence of easy access to information on prices and product availability imposes risks on all market participants, and producers may make different production and marketing decisions than they would if this information was easily available. Traders and consumers may also make decisions concerning purchases and sales that differ from those that they would make if they had good information. As a result, certain market participants may find it in their interest to collaborate in order to assure access to information of known quality up and down the vertical production, marketing, and consumption chains. Overall, differential access to information will have varying consequences for different groups within the society in terms of short-term costs and returns as well as food availability, nutrition, income and overall welfare. Research can provide policy makers with the information necessary to assess options and tradeoffs, only by recognizing the interdependent nature of Senegal's food and agricultural system.

3.2.1 A Matrix of Senegal's Food and Agricultural System

Interrelationships among functions and products in Senegal's food and agriculture system can be seen from the matrix presented in Figure 1. The matrix is a useful device for researchers, research administrators and policy makers, since it highlights all possible areas for research and places research that is actually undertaken in a broader context.

The rows of the matrix identify inputs and functions that are dealt with by at least some participants in the food system in some manner. Beginning with production inputs, the functions include extension, production transformation, storage and transport; the process of exchange through purchases, sales and other transactions and financing coordinating functions such as pricing, information, grades and standards and regulation; and consumption. The columns list food and agricultural products of policy relevance in Senegal, including cereals and oilseeds, fruits and vegetables, livestock, fish and animal products. Coordination functions are also presented. Each box on the matrix represents

Inputs and Functions	Products													Coordination Functions	
	Millet	Sorghum	Rice	Maize	Wheat	Groundnuts	Vegetables	Fruits	Cotton	Sugar	Livestock	Fish	Other Oils		Wood
Inputs															
Extension															
Production															
Transformation															
Storage															
Transportation															
Buying, Selling Other Transactions															
Financing															
Coordination Functions Price Information Quality Regulations Property Rights Exchange															

6

FIGURE 1
MATRIX OF SENEGAL'S FOOD AND AGRICULTURAL SYSTEM

a particular function and product or other coordinating function, and as such represents a potential area for research. A complete understanding of Senegal's food and agricultural system would require information in each box, obviously a very long term research goal.

The matrix is also useful for understanding the context within which policy options need to be evaluated. It is often proposed, for example, that input distribution or marketing costs can be reduced by eliminating intermediaries. As the matrix illustrates, however, certain functions must be performed by someone in order to provide products at the time and in the place and form desired. Thus, the critical policy issue is to identify the most efficient and effective means of performing the necessary functions that may be carried out by different agents, and not to focus on eliminating intermediaries.

In order to understand how BAME researchers will move from this broad food systems framework to specific studies that are useful to decision-makers, the following sections discuss the concept of subsector studies, the food accounting matrix as a methodological tool, and approaches to policy relevant research.

3.2.2 Subsector Studies

Individual BAME programs are organized along commodity lines that focus on individual subsectors (filières). According to Shaffer (1970), a subsector is defined as any meaningful grouping of economic activities that are linked vertically and horizontally through market relationships; Lauret (1983) similarly defines a filière. Vertical aspects include linkages among the distribution of inputs, production, assembly of products, processing, storage, exchange and consumption. Horizontal aspects involve linkages at a given stage in the system, for example competition among wholesalers. A subsector study describes and analyzes the actual functions performed in the production, physical handling and transfer of ownership of a commodity. Costs, margins and flows associated with these functions and the institutional environment in which those activities take place are considered. Alternatives for organizing the subsector are also to be evaluated.

Individual BAME studies will focus on the actual and potential performance of specific physical, facilitating and coordinating functions by specific market participants and intermediaries. The programs in each thematic area will also consider interdependencies among commodities, market participants and functions as well as behavioral incentives for individual participants and their implications for food system performance. Coordination among individual programs and operations will be directed toward facilitating an understanding of the organization, operation and performance of

the overall Senegalese food agricultural system. (Other aspects of the subsector study approach are discussed in BAME, December 1982; and Newman, Ndoye, Faye, May, 1984)

3.2.3 The Food Accounting Matrix

The food accounting matrix methodology is an extension of input-output modeling that permits the organization of information on the structure and operation of the food system. It can thus serve to link the results of subsector studies with macroeconomic outcomes.

Use of the food accounting matrix as a descriptive framework is planned as part of the research program on the food security situation. Other uses of the methodology were discussed in BAME, December 1983.

3.3 A Research Program Relevant for Policy Analysis

One of the objectives of creating the BAME is to reinforce the capacity of the Government of Senegal to evaluate policy options and tradeoffs. This task will be approached through: descriptive and diagnostic studies, evaluations of policy options and tradeoffs; a combination of short-term research output and investment in knowledge base needed for the long-term and provision of opportunities for Senegalese researchers to gain professional experience in undertaking policy-relevant research.

There are numerous studies of various elements of the Senegalese food and agriculture system that provide useful information for policy analysis. However, many studies emphasize very detailed descriptions of small parts of the system through detailed data collection in small numerous short-term studies (3 weeks to 3 months), often financed by donor agencies and designed to provide detailed evaluations for production and marketing projects. These documents also serve as a useful starting point for more in-depth analysis despite the limitations of short consultancy reports as a basis for policy decisions. In fact, the capacity of short-term consultants and evaluation missions to provide valuable insights is closely linked to the quality of on-going data collection and analysis within Senegal. For this reason among others, it is important to use Senegal's resources to build a long-term national research base and analytical capability.

The studies proposed by the BAME will make use of past research where available. They will also rely on the results of informal and formal surveys to describe and evaluate the organization, operation and performance of the food system and its components. This will contribute to an understanding of "what is", a diagnosis of constraints, and the

identification of opportunities for change. Other BAME research will be directed at evaluating alternative solutions to problems and at predicting policy outcomes relative to policy-makers conception of what should be (performance objectives). Any project directed at changing a long-term knowledge base also needs a mechanism to make research results available in the short-term. This not only provides feedback to researchers on the relevance of their research to policy discussions, but also makes research results available to policymakers in a timely fashion.

To respond to both short and long-term needs, two types of publications are planned:

1. Working papers that discuss issues or present initial research findings, and are distributed on an unofficial and provisional basis in order to stimulate discussion; and
2. Research reports and policy papers that will be more substantial and finished documents and which have been formally reviewed and officially cleared by ISRA.

A proposed list of working papers to be prepared during 1984/1986 is included in Appendix C.

The following section presents BAME personnel, funding, and the objectives, specific operations and implementation plans for the proposed BAME programs.

IV. PROPOSED RESEARCH PROGRAM

Before presenting the elements of the proposed BAME research program, this section describes the personnel currently available to the BAME and highlights several activities to be undertaken.

4.1 BAME Personnel

The BAME's Senegalese research staff includes the director and researchers in the following programs: Socioeconomics of Fish Production and Marketing (2); Vegetable Marketing (1); Livestock Marketing (1); and Cereals Marketing (1). Another researcher will join the BAME after completing M.S. training in the U.S. in early 1985. There are also two temporary researchers, one assisting with the marketing research program and the other with the economics of agricultural production and food security programs.

Expatriate technical assistance includes two agricultural economists provided by Michigan State University under the USAID Agricultural Research and Planning Project; one agricultural economist provided by SECID under the USAID Lower Casamance

Project; and a fisheries economist and geographer provided by ORSTROM. In addition, three research associates are being provided under the MSU/USAID project in the areas of cereals marketing, distribution and use of agricultural inputs, and food security.

4.2 Funding

Funding for the BAME research program for 1984/85 is being provided by assistance from USAID,⁸ a loan from the IDA,⁹ technical assistance personnel from France, contributions from Senegal's national budget, and several research agreements.¹⁰ For 1986, funding is partially assured and reasonable hope exists for obtaining the rest. Beyond 1986 the limited number of permanent national research personnel should permit any necessary program adjustments without too much difficulty.

4.3 Implementation Approach

During meetings within ISRA and with other government organizations, clear agreement was reached on the importance of coordinating the proposed research with related activities of other organizations. This will minimize overlap between the BAME's programs and others. It will also open up the possibility of collaboration between BAME researchers and those working on similar problems in other agencies.

4.3.1 Avoiding Duplication of Effort

As noted in the original version of the BAME research plan, each major research program will begin with a review of the literature in the subject area concerned. This allows researchers to take advantage of the findings of previous research and to orient their own research into areas needing further attention. This also minimizes the possibility of duplication of research activities.

4.3.2 A Consultative Committee on Agricultural Policy Research

In order to improve and assure links with other government agencies concerned with agricultural policy, a Consultative Committee on Agricultural Policy Research will:

⁸USAID-GOS Projects 685-0203 (Lower Casamance), 685-0223 (Agricultural Research and Planning) and Title III PL 480.

⁹IBRD-GOS Credit Agreement 1176 SE.

¹⁰IDRC, MIR-FRANCE

1. Discuss proposals for new research programs;
2. Evaluate the progress of current programs and research results, and;
3. Formulate recommendations for food and agricultural policy on the basis of research findings.

Several issues concerning the status of the committee are outstanding:

1. The committee's role vis-a-vis ISRA's Scientific and Technical Committee (STC). This committee could be specialized subcommittee of the STC, either sending its findings and recommendations to the STC, to both STC and ministries concerned, or directly to the ministries concerned. In the latter case, it would be useful to have the committee coordinate all research on agricultural policy carried out in Senegal.
2. In order to give the Committee sufficient stature it might be necessary to have its member appointed by the Ministry of Scientific Research.
3. The composition of the committee could include representatives from: the Ministries of Rural Development, Plan and Cooperation (Direction of Planning, Scientific Research (DRAAI), Finance (Direction of Forecasting), Commerce, President's Office (Bureau of Organization and Methods), Price Stabilization Fund (CPSP); Food Security Commisariat (CSA); SONAR; School of Law and Economics (University of Dakar); Director General of ISRA and BAME Director.

4.3.3 Contributing to Improved Agricultural Statistics

Accurate and complete agricultural statistics must be available if the BAME research programs or any other form of policy analysis are to provide valid results. Although the improvement of official agricultural statistics falls outside the resources and mandate of the BAME, the consultative committee could create a working group to deal with this question. This group, comprised of representatives from government and non-government agencies, could identify areas in which improved statistics are most needed to support sound policy analysis, examine data collection methodologies and examine options for achieving desired improvements. The group will also facilitate the exchange of existing information among researcher and other users.

4.3.4 Research Collaboration and Internships

The BAME is quite open to exploring all avenues of collaboration with other researchers and research organizations. This might take the form of:

1. Joint research programs involving a variety of financial arrangements;

2. Hosting personnel from other organizations on a part-time or fixed-term basis;
3. Offering internships with access to BAME resources for carrying out well-defined short-term studies. This will not only help speed-up implementation of the BAME research program, but also provide a learning experience to the interns that should contribute to their future professional involvement in research and development programs. To date, interns from the Food Technology Institute (ITA) and the University of Dakar have participated in this program.
4. Within the limits of available time and to the extent that is consistent with overall BAME objectives, specific contract research and studies could be undertaken.

4.4 Research Programs

The following summaries present the major objectives, activities and expected outputs of the research programs. The programs are divided under three themes: Economics of Production; Marketing; and Food Security Situation.

4.4.1 Economics of Production

4.4.1.1 Economics of Agricultural Production

Evaluating options in agricultural policy depends in large part on the knowledge of costs and revenues of agricultural production and the use of the most appropriate technology. It is necessary to have constant access to such information, given the fluctuations over time of prices on the international market, the tendencies that influence the level of technology and environmental conditions. Although certain aspects of agricultural policy must be considered on the national and regional levels, it is, nevertheless, essential to have data from the local level, from producers and other economic agents. Three activities are planned:

1. A bibliographic review of studies on costs and revenues of agricultural activities according to the type of activity and level of production. (A working paper is planned by the end of 1984).
2. Budgets for agricultural activities and priority systems of production. A standard format will be presented and proposed budgets will be developed in collaboration with the farming systems team. This should be completed in 1985.

3. An evaluation of alternative solutions concerning agricultural policy and technical innovations. Quantitative computerized modeling may be used in this process.

A working paper on the linkages between BAME researchers and the farming systems team is foreseen for the end of 1984. The identification and evaluation of priority problems will be done in 1985, and final report is planned by the beginning of 1986.

4.4.1.2 The Study of Input Distribution and Use in the Sine-Saloum

Providing producers with inputs is of vital importance. There are, however, difficulties which often limit the availability and efficiency of input use for peasant farmers. The government is also in the process of re-examining the system of input distribution to the rural population. Thus, better knowledge of the structure and cost of input distribution systems and their use by the producers is required. The Sine-Saloum was retained as a study area because:

1. This region plays an important role in the agricultural activity of Senegal.
2. Improvement in agricultural productivity in Sine-Saloum depends, in large measure, on the structures and policies concerning inputs; and
3. Close links between this study and others already in progress concerning the production systems and marketing of grain will permit an examination of important aspects of the problem at different levels.

In this study, the accent will be placed on fertilizers (as inputs) and seeds (corn, millet and peanuts). Other inputs and crops will be considered according to their importance. The structure and operation of input distribution will be studied from fabrication (local or imported) to their use by the producer in Sine-Saloum. The proposed activities are:

1. A bibliographic review of studies on the distribution and use of inputs in Senegal. (Working paper towards the end of 1984).
2. A descriptive/diagnostic study of input supply to producers (Working paper in early 1985).
3. Economic analysis of the use of inputs at the production level including the efficiency of input use and decisions by producers concerning the methods of input use. (Surveys planned for 1984/1985). (Working Paper for mid-1985).
4. Evaluation of possible options concerning the distribution method and prices of inputs. (Final report before the end of 1985).

4.4.1.3 Oceanic Resources

4.4.1.3.1 Macro-Economic Analysis of Traditional Fisheries

This research program, begun in 1980, gives us the basic socio-economic data necessary to assist rational planning and management of the fishing industry. The studies include a twice yearly census of the number of boats (pirogues) and year-long monitoring of a sample of fishing units.

The census permits following the migratory practices of the fishermen and measuring the level of activity of the group as a whole. The regularity of the census provides important data on evolutionary tendencies and allows an evaluation employment generation in this sector. A list of fishing villages is kept up-to-date, including information on the infrastructure at each unloading point. This assists planners and policy makers in evaluating prospective projects, and to follow changes to the installation of new infrastructure.

With the annual follow-up of fishing units, more precise knowledge of employment, fishing methods, costs of production, and fisherman income and the division of value added between industrial and traditional fisherman is obtained. It will eventually be possible to develop budgets for traditional fishing enterprises that can be kept up-to-date.

4.4.1.3.2 Historical and Sociological Aspects of Fishing

The main objective in the first phase of this sociological study of traditional fisheries, is to create an inventory of historical transformations, current conditions and the participating social groups in the sector. An in-depth study of the historical aspects seems necessary in order to define conditions under which this sector may evolve.

4.4.2 Marketing

4.4.2.1 Grain Marketing in the Peanut Basin and National Grain Marketing Policy

The pursuit of national food self-sufficiency and agricultural development objectives requires the ability to identify and evaluate grain policy options. This necessitates improved broader knowledge of the actual conditions and the organization, operation, and performance of grain marketing sub sectors. The effects of different options on these sub-sectors also requires study. Studies of the peanut basin and national

policy will be closely linked with regional studies of the grains sub-sectors in the Casamance and Senegal River Valley.

ISRA has already conducted several socio-economic studies of grain marketing including:

- a) Grain marketing at Thyse-Kaymor-Sonkorong (Sine-Saloum), (BA, 1982); and,
- b) The LAT-CRIZA study "Systems of Production-Consumption; Actual and Potential Tradeoffs at the Farm Level in Senegal", which collected detailed information on nutrition, income and costs in 40 compound in three villages (Got, Ndiamsil and Koumbidia). These surveys were conducted by the BAME in co-operation with GERDAT.

In addition, as part of Title III-financed "Agricultural Policy" Studies, ISRA conducted inquiries at the production level and SONED studies grain markets and worked with model of agricultural prices.

The current program will (1) improve understanding of the actual state of knowledge on the organization, operation and performance of grain markets in Senegal, particularly in the peanut basin; (2) improve knowledge of the roles and operation of participants in the sub-sector from producers to local consumers and international markets; (3) estimate flows, costs and margins; (4) analyze the economic impact of proposed policy options concerning, for example, the organization of grain marketing, the role of village co-operatives, agricultural prices, etc. The planned activities and results are:

1. A bibliographic review of studies on Senegalese grain marketing. (Bibliography, May, 1984. Review of literature, late 1984).
2. Formal and informal surveys on the organization, operation and performance of the grain sub-sector, principally in the peanut basin, supplementary analysis of data from the LAT/CRIZA study and agricultural policy studies on grain transactions (mid-1984);
3. Periodic studies on marketing, transport, storage, processing, financing, regulation, etc.;
4. An overall national synthesis study on grain marketing (sub-sector) and an evaluation of organizational options for the subsectors and options in grains policy. (Working Paper for 1985).

4.4.2.2 Grain Marketing in the Casamance

The Casamance is often described as the "bread-basket" of Senegal. Regional self sufficiency in rice and rice exports to other regions in Senegal are two prime objectives of the national plan.

The scarcity of Casamance rice on the national market is often explained in terms of absence of price stimulation, the absence of marketing system for the product, insufficient stocks at the farm level, and the high rate of rice consumption by the local population (who have a marked preference for rice over other grains). This study was begun in order to determine the problems linked with production, distribution and consumption of grain in Casamance. The planned activities are:

1. A study of the quantity of grain stored at the farm-level. A report on the storage of grain at the farm-level in the Middle and Lower Casamance is foreseen for the end of 1984.
2. Analysis of official and traditional marketing channels for grain; in the Lower and Middle Casamance and the role played by participants in the marketing of grain products. The report will be available toward the end of 1984.
3. Analysis of consumer preferences for different grains and the effect of these preferences on grain production in Lower and Middle Casamance. A report will be available towards the end of 1984.

4.4.2.3 Grain Marketing in the Senegal River Valley

With projected increases in irrigated land in the Fleuve region, annual production is expected to reach 150,000 metric tons of paddy rice by 1990. This could lead to the marketing of close to 100,000 metric tons per year, contributing substantially to the achievement of government self-sufficiency and food security objective. The marketing study includes the following activities:

1. A bibliographic review of the grain subsector in the Fleuve region.
2. Preliminary descriptive and diagnostic analysis of the organization, operation and performance of subsector.
3. An in-depth study of subsector organization, operation and performance, both present and future, with emphasis on processing, transport, storage and financing.

4.4.2.4 Livestock and Meat Marketing in the Sylvo-Pastoral Zone and Towards Dakar

Given the growing importance of livestock production and the limited number of studies done in this area, a new research program on livestock and meat marketing was begun in 1984. The activities planned include a review of literature concerning meat and livestock marketing in Senegal. This will serve as a base for preliminary diagnostic study on the organization, operation and performance of livestock, meat and other related product markets. It will also contribute to the definition of a more precise program for future studies.

4.4.2.5 Systems of Production and Distribution in the Casamance Fishing Industry

The study, begun in November 1983, has four main objectives;

1. To conduct a socio-economic inventory of fishing activities in the Casamance;
2. To learn the dynamics of the system of production and distribution in this sector. Special emphasis will be placed on understanding different strategies contributing to the diversity of fishing activity in the region.
3. To supply basic data to authorities for the preparation of development projects.
4. To predict change within the Casamance fishing subsector and evaluate options for responding to it.

4.4.2.6 Marketing of Fish and Fish Products

4.4.2.6.1 Monitoring and Price Analysis

In order to make good use of biologists' estimates of fish production, a solid knowledge of prices is needed by planners and economists. This research operation consists of daily price reporting at unloading zones along the coast (Mbour, Joal, Kayar, St-Louis and Hann) and wholesale and retail prices on the market at Gueule Tapee (Dakar); price information and seasonal variation will also be studied.

4.4.2.6.2 Fish Marketing in the Interior of Senegal

This study will focus on the organization of marketing channels with emphasis on markets, price mechanisms, consumer preferences, absorption capacities of interior markets, and conditions of access to these markets for fish wholesalers. The study of interior markets complements studies of fish marketing that focus on the sale of fresh fish in Senegal and the socio-economic aspects linked to fish marketing.

Study results can complement biological data and serve as useful inputs for planning. A combination of inventories of fishing boats and infrastructure, price data at unloading points and interior markets can all contribute to broad-based analysis of the potential impacts of alternative policies on different participants in the fisheries subsector.

Given the interdependency between traditional and industrial fishing, research will increasingly include the latter as resources become available.

4.4.2.7 Vegetable Marketing

Vegetable production is important for farmer from both nutritional and income perspectives. The main producing areas are the Niayes (Cap-Vert) and the Casamance. The research program includes two operations which have been under way for two years:

1. Studies of marketing and price variation in Casamance;
2. Studies of market organization and price determination in vegetable markets in the Niayes and the Cap Vert Region.

On the basis of extensive surveys conducted in the Casamance, a revised report on vegetable market organization and seasonal price variation will be published towards the end of 1984.

The Niayes project includes data collection on prices and interviews with wholesalers and retailers. A report presenting a typology of vegetable market participants, estimates of costs, margins and price variation is expected in late 1984.

4.4.3 Food Security Situation

Food self-sufficiency, a key objective of Senegal's development policy, requires a better definition and a set of operational goals and strategies. Evaluation of food security options requires more detailed data as well as a methodology capable of encompassing the effects by region and by socio-economic group. This should provide a more adequate method of understanding: (a) food products flows, especially grain, at different levels; and (b) the impact of alternatives government policies on supply and demand of different grains.

The research activities planned are:

1. A bibliographic review of food security situation studies in Senegal and efforts concerning concepts and strategies of food security (Working Paper before mid-1985).

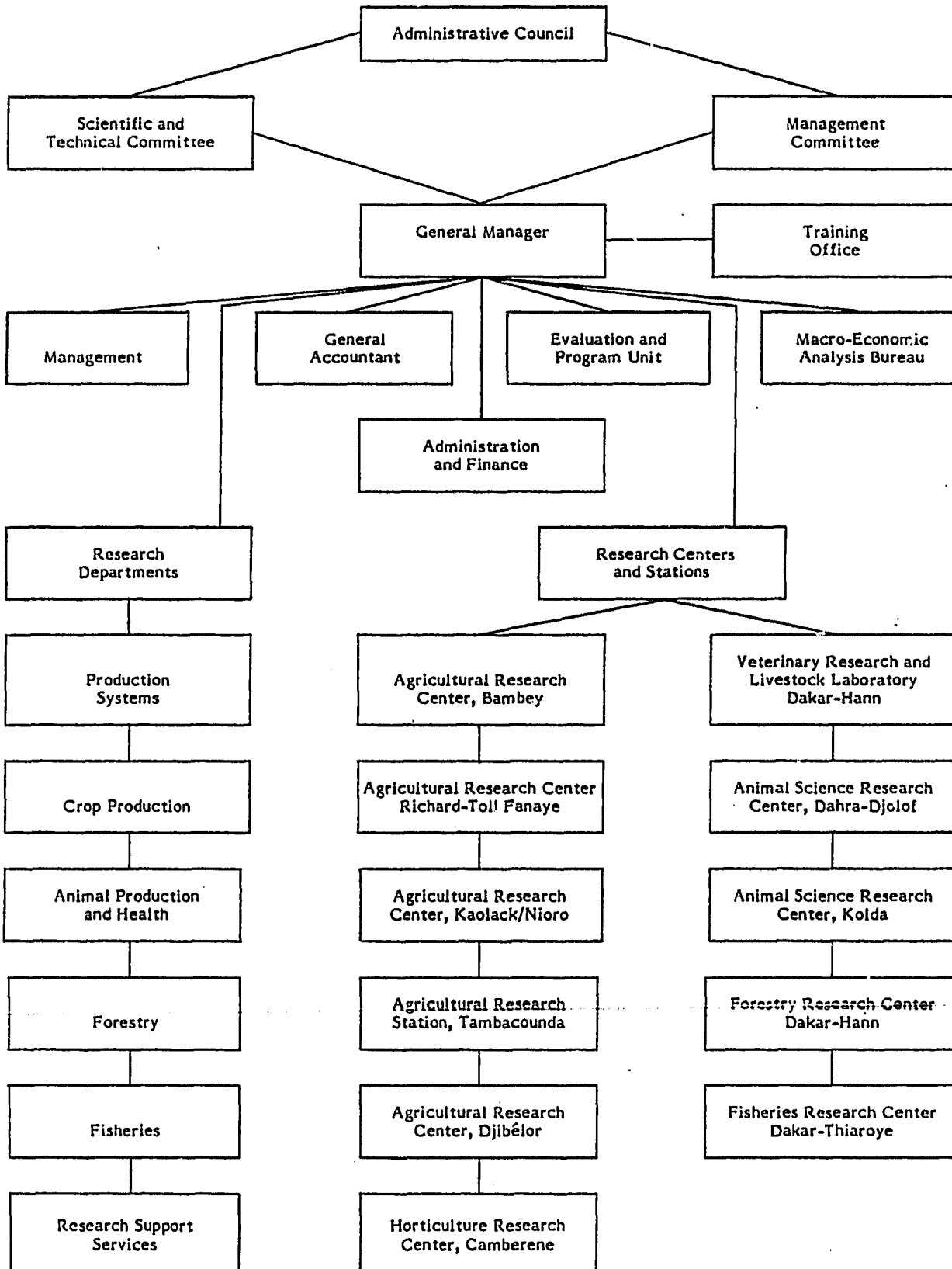
2. Identification of appropriate concepts and strategies of food security in the Senegalese context (Working Paper before mid-1985).
3. Preparation of food situation balance sheets by region and by socio-economic group that will indicate the consumers. (Working Paper for the end of 1985).
4. Evaluation of the impact of possible options on the food situation. (Working paper for beginning of 1986).
5. Identification of future research programs, for example: a study of factors which influence demand for grain. (Proposal before mid-1986).

APPENDIX A
BAME PLAN OF WORK - 1984-1986

PROGRAM/ACTIVITY/OPERATION	1984	1985	1986	RESEARCHERS
1. <u>THE ECONOMICS OF AGRICULTURAL PRODUCTION</u>				
LITERATURE REVIEW	—			MBAYE/CRAWFORD
CROP BUDGETS	—			CRAWFORD/MBAYE
AGRICULTURAL INPUTS	—	—		KELLY/CRAWFORD
AGRICULTURAL POLICY OPTIONS		—	—	CRAWFORD
ANALYSIS OF PRODUCER DECISIONS		.....	.....	(TO BE DEFINED)
MACRO-ECONOMICS OF FISHERIES	1980 →			KEBE
HISTORY AND SOCIOLOGY OF FISHERIES	—			CHAVEAU
SOCIO-ECONOMY OF FISHERIES IN THE LOWER CASAMANCE				DIAW/CORMIER
2. <u>MARKETING STUDIES</u>				
A. <u>CEREALS MARKETING</u>				
LITERATURE REVIEW	—			NEWMAN/SOW/NDOYE
ANALYSIS OF CEREALS EXCHANGES	—	—		NEWMAN/NDOYE
SUB-SECTOR STUDIES - LOWER AND MIDDLE CASAMANCE	—	—		JOLLY
SUB-SECTOR STUDIES - GROUNDNUT BASIN	—			NEWMAN/NDOYE
SUB-SECTOR STUDIES - SENEGAL RIVER VALLEY	—	—		MORRIS
SYNTHESIS - ORGANIZATIONAL AND POLICY OPTIONS		—	—	NEWMAN/NDOYE/SOW
REGIONAL AND INTERNATIONAL MARKETS		.....	.....	NEWMAN
B. <u>FRUIT AND VEGETABLE MARKETING</u>				
PRICE MONITORING - DAKAR	1978 →	—	—	SECK
SUB-SECTOR STUDIES - NIAYES	1982 →			SECK
SUB-SECTOR STUDIES - LOWER CASAMANCE	1983 →			JOLLY
C. <u>MEAT AND LIVESTOCK MARKETING</u>				
LITERATURE REVIEW AND PRELIMINARY STUDIES - FERLO/DAKAR	—			NDIONE
SUB-SECTOR STUDY		.....	.....	(TO BE DEFINED)
D. <u>FISHERIES MARKETING</u>				
PRICE ANALYSIS AND MONITORING	1981 →	—	—	CHABOUD/KEBE
INTERIOR MARKETING	—	—	—	KEBE/CHABOUD
INDUSTRIAL FISHERIES			.....	DEME
3. <u>FOOD SECURITY ANALYSIS</u>				
LITERATURE REVIEW	—			MBAYE/CRAWFORD
ANALYSIS OF CONCEPTS AND STRATEGIES FOR FOOD SECURITY	—	—		CRAWFORD/MARTIN
EVALUATION OF ALTERNATIVE STRATEGIES		—	—	MARTIN/CRAWFORD
FOOD DEMAND AND CONSUMPTION ANALYSES		.....	.....	(TO BE DEFINED)
4. <u>WORKING GROUP - AGRICULTURAL STATISTICS</u>		—	—	NEWMAN/CRAWFORD/SOW
5. <u>CONSULTATIVE COMMITTEE</u>	—	—	—	FAYE

NOTE: ASTERISKS INDICATE A POSSIBLE PROGRAM.

APPENDIX B
ISRA ORGANIZATION CHART



APPENDIX C

PROPOSED WORKING PAPERS 1984-1986

I. Economie de la ProductionA. Economie de la Production Agricole

1. Bibliographie annotée des études socio-économiques au niveau exploitation et village. M. Mbaye et E. Crawford. 1984.
2. Compilation préliminaire des informations sur les coûts et revenus des principales spéculations et systèmes de production. M. Mbaye et E. Crawford. 1984.
3. Les articulations entre les programmes de recherche du BAME et du Département Systèmes--Liens "Micro-Macro." E. Crawford. 1986.
4. Evaluation des solutions alternatives concernant la politique agricole et des innovations techniques--Rapport final. E. Crawford. 1986.

B. Etude de la distribution et de l'utilisation des intrants dans le Sine-Saloum

1. Revue bibliographique des études sur la distribution et l'utilisation des intrants agricoles au Sénégal. V. Kelly et M. Mbaye. nd.
2. Description et diagnostic du système de la distribution des intrants au Sénégal. V. Kelly et E. Crawford. 1984.
3. Analyse des décisions des producteurs et de l'économie de l'utilisation des intrants agricoles. V. Kelly et E. Crawford. 1985.
4. Evaluation des options concernant la distribution et le prix des intrants. E. Crawford et V. Kelly. nd.

C. Socio-Economie de la production des produits halieutiques

1. Resultats du recensement du parc piroguier sénégalais. 1984, 1985, 1986.
2. Dictionnaire des points de débarquement du littoral sénégalais. 1984, 1985, 1986.
3. Suivi de 80 unités de pêche: résultats et méthodologie. J. Weber. 1984.
4. Mareyage à partir des grands points de débarquement et arrivages de poisson frais à Gueule Tapée. M. Kebe. 1984.
5. Formes d'exploitation du milieu: communautés humaines et rapports de production dans le secteur de la pêche en Casamance (première approche dans l'étude des systèmes de production). C. Diaw. 1984.
6. Estimation de la valeur ajoutée de la pêche artisanale en 1983. T. Diakhate. 1984.

7. Histoire économique des pêcheries européennes et industrielles au Sénégal jusqu'aux premières années de l'indépendance (essai de comparaison avec la situation contemporaine). Chauvau. 1985.
8. Migrations des pêcheurs en Casamance. C. Diaw et M. C. Cormier. 1985.
9. Systemes d'exploitation continentaux en Casamance: relations avec les autres systèmes d'exploitation du milieu. M. C. Cormier. 1985.
10. Financement de la pêche industrielle sénégalaise. M. Mbambi. 1985.
11. Le financement de la pêche artisanale sénégalaise. A Nguer. 1985.
12. Etude des rapports de production dans le secteur de la pêche. C. Diaw. 1986.
13. Pêche paysanne en Casamance: rapport avec les autres activités rurales. M. C. Cormier. 1986.
14. Mareyage a partir des points de débarquement et arrivages de poissons frais au marché de Gueule Tapée. M. Kebe. 1986.

II. Commercialisation

A. Commercialisation des Céréales

1. Commercialisation des produits agricoles et politique agro-alimentaire: essai bibliographique pour une recherche au Sénégal. P. A. Sow et M. D. Newman. 1984.
2. Recherches sur la commercialisation des céréales du Sénégal. M. D. Newman, O. Ndoye et J. Faye. Mai 1984.
3. Description et diagnostic des sous-secteurs céréaliers régionaux dans (a) le Bassin Arachidier, O. Ndoye et M. D. Newman; (b) la Casamance, C. Jolly; et (c) le Fleuve, M. Morris; et (d) sur Le Plan National, M. D. Newman, P. Sow et O. Ndoye. 1984.
4. Approches à l'étude des marchés, des intermédiaires et des familles: compte-rendu d'un atelier, 1984. Eds. O. Ndoye et M. D. Newman.
5. Situation céréalière en Basse Casamance. C. Jolly, M. Kamuanga, S. Sall et J. Posner. 1984.
6. Evaluation des séries de données statistiques appropriées à l'analyse de la politique agro-alimentaire au Sénégal. A. Sow et M. D. Newman. 1984.
7. La réglementation et l'organisation des marchés céréaliers au Sénégal: Situation actuelle et évolution historique. A. Sow et M. D. Newman. 1984.
8. Le rôle des femmes dans la commercialisation des céréales au Senegal. 1985.

9. Documents sur divers aspects du fonctionnement de la filière: le transport, le financement, la transformation des produits, stockage, etc. 1984-1986.
 10. Documents sur les questions prioritaires concernant les participants au système agro-alimentaire: les grossistes, les détaillants, les coopératives et les sociétés de développement rurales. 1985-1986.
 11. Documents sur le rôle et les options du Sénégal dans les marchés internationaux des oléagineux, des intrants, des céréales, etc. 1984-1986.
 12. Préférences céréalières en Basse et Moyenne Casamance. C. Jolly. 1984.
- B. Commercialisation du bétail et de la viande
1. Description et diagnostic de la filière à partir de la zone Sylvo-pastorale à Dakar. C. M. Ndione. 1984.
 2. Proposition d'un programme de recherche à moyen terme sur la commercialisation du bétail et de la viande.
- C. Commercialisation des légumes
1. Commercialisation des légumes dans la Basse Casamance. C. Jolly. 1984.
 2. Typologie des agents économiques évoluant dans les marchés de détail et impact du transport sur les coûts de commercialisation. Seck. 1984.
 3. Situation du marché de la pomme de terre. Seck. 1984.
 4. Méthodologies et résultats de la collecte des prix au détail. Seck. 1984.
 5. Analyse de l'offre des légumes à Dakar au niveau grossist. Seck. 1984.
 6. Etude économique des semences de pomme de terre produits localement. Seck. 1985.
 7. Détermination des couts de production des produits maraichers dans les Niayes. 1986.
 8. Analyse économique de la rentabilité des produits phytosanitaires dans le maraichage. Seck. 1986.
- D. Commercialisation des produits de la pêche
1. Commercialisation du poisson frais dans les régions intérieures: bilan provisoire. M. Kebe et C. Chaboud. 1984.
 2. Aspects de la commercialisation du poisson transformé au Sénégal. C. Faussey. 1984.
 3. Commercialisation du poisson dans la région de la Casamance. M. Kebe et C. Chaboud. 1984.

4. Analyse des prix au débarquement et sur le marché de Gueule Tapée. C. Chaboud. 1985.
5. Rapports sur l'état d'avancement de l'enquête sur la commercialisation du poisson à l'intérieur du Sénégal. M. Kebe. 1985.
6. Structure des prix au débarquement et sur le marché de Gueule Tapée. C. Chaboud. 1986.
7. Commercialisation du poisson de mer dans les régions intérieures du Sénégal. C. Chaboud et M. Kebe. 1986.

III. Analyses de la Situation Alimentaire

1. Bibliographie annotée des études de la sécurité alimentaire au Sénégal. M. Mbaye, E. Crawford et F. Martin. 1984.
2. Des concepts et stratégies de la sécurité alimentaire appropriés au Sénégal. E. Crawford et F. Martin. nd.
3. Bilan provisoire de la situation alimentaire au Sénégal. F. Martin et E. Crawford. 1985.
4. Evaluation des interventions alternatives sur la situation alimentaire au Sénégal. F. Martin et E. Crawford. nd.
5. Programmes de recherche prioritaire dans le domaine de la sécurité alimentaire au Sénégal. Quelques propositions. F. Martin et E. Crawford. 1986.

BIBLIOGRAPHY

- Ba, Fatou Ndao. "Analyse de la situation céréalière dans l'unité expérimentale de Thyssé-Kaymor-Sonkorong (Sine-Saloum)." Thèse de Masters of Science. Montpellier: Institut Agronomique Méditerranéen, 1982.
- Baris, P. et Ph. Couty. "Prix, marchés et circuits commerciaux africains." Paris: Amira No. 35, 1981.
- Courtant, J. J. et R. D. Hirsh. "Rapport de la Mission de Supervision du Projet FAC/CCCE de Stockage Céréalière et de Diagnostic de la politique céréalière Sénégalaise." France: Ministère des Relations Extérieures, Coopération et Développement; Caisse Centrale de Coopération Economique. Décembre 1982.
- Crawford, E. "Final Report on Consulting Mission." May 31-June 17, 1982, Dakar: Department of Agricultural Economics, Michigan State University/ISRA Projet de Recherche et de Planification Agricole.
- "La faim dans le monde: quelle solutions pour l'Afrique?" Communication de la Commission No. 1: Problématique de la production agro-alimentaire en Afrique." Dakar, Octobre 1983.
- Hay, Roger W. "The food accounting matrix: an analytical device for food planners." Oxford Bulletin of Economics and Statistics, 42 (May, 1980) 97-124.
- Lauret, F. "Sur les Etudes de Filières Agro-Alimentaires." INRA Série Notes et Documents; No. 49, Montpellier: Institut National de la Recherche Agronomique, Janvier 1983.
- Leibenstein, H. General X - Efficiency Theory and Economic Development. London: Oxford University Press, 1978.
- Ndoye, Ousseynou et Mark D. Newman. "Approches à l'Etude des Marchés, des Intermediaires et des Familles: Actes d'un atelier tenu à Kahone, Sénégal," 8-13 Mars 1984. Dakar: ISRA-BAME, Document de travail. A paraître.
- Newman, Mark D. "Mise en place d'un programme de recherche sur la commercialisation et les échanges internationaux au BAME de l'ISRA: rapport de mission de Mars 1983." Dakar: Department of Agricultural Economics, Michigan State University/ISRA Projet Recherche et Planification Agricole, Avril 1983.
- Newman, Mark D., Ousseynou Ndoye, et Jacques Faye. "Recherche sur la commercialisation des céréales au Sénégal." Note préparée pour les séminaires IFPRI, ICRISAT, GERDAT, CIRES, CEDRES sur "The Changing Role of Coarse Grains in SAT West Africa" et CIRES "La commercialisation des produits agricoles." Abidjan, Côte d'Ivoire. Mai 1984.
- Peterson, Wesley. "Rapport de mission - Projet de Recherche et de Planification Agricole, 29 aout-19 Septembre 1982, Dakar: Michigan State University/ISRA Projet Recherche et Planification Agricole.

République du Sénégal. Comité Permanent des Grands Produits Agricoles. Groupe filière céréales. "La filière céréalière: note de situation et propositions d'action." Dakar, Juillet 1983.

_____. Ministère du Développement Rural. "Journées nationales de réflexion sur la production agricole et la stratégie alimentaire du Sénégal - Rapport final." 11 Novembre 1983.

_____. Ministère du Développement Rural. "La nouvelle politique agricole du Gouvernement." Exposée par M. Amadou Bator Diop, Ministre du Développement Rural à l'occasion des réunions de concertation Gouvernement-Bailleurs de fonds sur les sociétés de développement rural. Dakar, 19 Novembre 1983.

_____. Ministère du Développement Rural, Direction Générale de la Production Agricole. Direction des Etudes, des Methodes et du Plan. "Plan d'investissement alimentaire 1977-1985." Dakar, Fevrier 1977.

_____. Ministère du Plan et de la Coopération. Vie Plan Quadriennal de Développement Economique et Social - 1981-1985. Dakar, 1982.

_____. Ministère du Plan et de la Coopération. "Requête d'Aide Alimentaire 1983-1984." Dakar, Décembre 1983.

_____. Ministère de la Recherche Scientifique et Technique, Institut Sénégalais de Recherches Agricole, Bureau d'Analyses Macro-Économiques (BAME). "Recherche sur les Aspects Macro-Economiques de l'Agriculture Sénégalaise: Questions prioritaires et proposition d'un plan de travail." Décembre 1983.

Shaffer, James. "Les mécanismes de formation de prix: quelques problèmes de politique." Aperçu du contexte institutionnel dans Price Processes and the Changing Nature of Food Systems. Documentation for the seminar organized by OECD. Paris: OECD, July 1980.

_____. "On the concept of subsector studies." Technical seminar on Modelling of Food and Agricultural Economics. University of Florida, 1970.

Shaffer, James, E. Crawford, Mark D. Newman, M. Morris, P. A. Sow, O. Ndoye et C. M. Ndione. "Matrice des Fonctions et Produits du Système Agro-Alimentaire Sénégalais." ISRA, BAME, Mars 1984.

Sow, P. A. et Mark D. Newman. "Commercialisation de produits agricoles et politique agro-alimentaire: essai bibliographique pour une recherche au Sénégal." Dakar, ISRA, Bureau d'Analyses Macro-Économiques, Mai 1984.

MSU INTERNATIONAL DEVELOPMENT PAPERS

		<u>Price</u>
IDP No. 1	Carl K. Eicher and Doyle C. Baker, "Research on Agricultural Development in Sub-Saharan Africa: A Critical Survey," 1982 (346 pp.).	\$ 8.00
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