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PROPOSAL

Agricultural Development in Senegal:
Perspectives, Risks, and Production Strategies

Woodrow Wilson School
Princeton University
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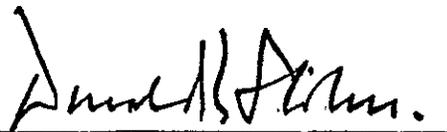
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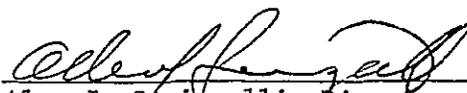
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Henry Bienen, Director
Research Program in Development Studies
Woodrow Wilson School
Princeton University



Donald E. Stokes, Dean
Woodrow Wilson School of Public and
International Affairs
Princeton University



Alan J. Sinigalli, Director
Office of Research and Project Administration
Princeton University

TABLE OF CONTENTS

	<u>Page</u>
I. Introduction	1
II. Institutional Aspects of the Development and Implementation of Agricultural Strategy	4
A. Draw lessons from the four major phases of rural growth strategies to date	5
B. An assessment of the goals of institutional actors	6
C. Target groups and levels	6
D. Instruments	7
E. Performance goals	9
III. Uncertainty and an Economic Strategy for Senegal	10
1. The Problem	10
2. Scope of the Analysis	10
3. Theoretical Research	11
4. Empirical Research	15
IV. Personnel	17
V. Output	19
VI. Budgets	21
VII. Curriculum Vitae	27

I. Introduction

Senegal has come to a critical juncture in its economic and political life. As the AID Country Development Strategy Statement for FY 1983 and the various papers done for the Joint Assessment of U.S. Assistance Programs in Senegal all make clear, new directions have to be undertaken in economic policy and administrative structures. A new political leadership is in place and significant reforms are already underway. USAID is also reformulating its activities in Senegal, building on the Joint Assessment evaluations.

Princeton University's Research Program in Development Studies believes that it can make a significant input to the study of agricultural development strategies in Senegal. We have already carried out four major country studies in the political economy of income distribution in Mexico, Egypt, Nigeria and Turkey. The Director of RPDS, Henry Bienen, has been involved in the Joint Assessment exercise. Above all, RPDS has already developed a proposal on the political and economic risks in export orientation, choice of technology, and capital sources, which is before the International Economics Division of the Department of Agriculture. This involves study of a number of problems which are relevant to Senegal's own development strategies. (USAID Senegal and the Senegal desk, USAID Washington, have copies.)

The comparative advantages and costs of producing traditional food stuffs for the domestic market, especially millet, compared to producing food crops such as rice -- which are now taking up significant foreign exchange through importation is a terribly important policy issue for Senegal. Similarly, how much revenue can be raised from increasing groundnut

production and thus providing funds for foreign exchange involves an analysis of the costs and benefits of reaching food self-sufficiency through trade. So does the question of diversifying into new exports of either agricultural commodities or manufactures.

These issues have been central to our own concern with analyzing the interrelated aspects of production, storage, transportation and marketing price and trade policies. As our proposal on agricultural development strategies notes:

While the prospects for rural reform strategies cannot easily be generalized to developing countries as a whole and while strategies must be country-specific in order to take account of critical political and cultural, as well as economic variables, we can, at a high level of generality, characterize the options available for countries in terms of a limited number of key (and unresolved) issues:

(1) the extent to which development should focus on the cultivation of export crops rather than on expanding sources of food for domestic consumption;

(2) the extent to which the finance and ownership of productive resources should involve foreign and/or public sources rather than the maintenance of small, largely self-financing farms; and the role of large-scale private farms versus medium or small-scale private farms;

(3) the role of the public sector in providing goods to the rural sector;

(4) the extent to which the public and/or foreign investors should be involved in the domestic pricing and overseas marketing of agricultural commodities;

(5) the rate at which new agricultural technologies should be introduced into the agricultural sector and the form of these technologies.

The context for Senegal, as for most developing countries, is one where trade issues loom very large. Indeed, for Senegal, issues of trade and regional and international development are closely linked because: 1) Senegal remains in the franc zone, and 2) important new development projects involve cooperation with Mali and Mauritania in the OMVS. The issue of joint development of the Senegal River Basin involves coordinating price and tariff policies with neighboring countries. Since capital investments are going to be undertaken which will have effects on at least three countries, the costs and benefits of OMVS projects must be weighed in the regional context.

We feel we have a very strong comparative advantage in building on work done at Princeton and elsewhere on models of risk and opportunity through which to consider problems of trade, investment, agricultural strategies. Moreover, our own comparative advantage at Princeton has been to work on issues that lend themselves to joint efforts by economists and political scientists. Analysis of the development and implementation of agricultural strategies requires sensitivity to political and administrative concerns as well as to economic development and trade issues.

These issues could not be more relevant to Senegal. Senegal's Plan de Redressment has the two major objectives of: 1) bringing about increased financial rigor in management of the economy as a basis for increased growth; 2) decentralizing decision-making within the economy which entails the progressive disengagement of the government from many of the kinds of activities in which it has been involved in the rural sector.¹

¹ See Donald Brown, "Senegal's Plan de Redressment," Dakar, October 15, 1980.

Senegal is now engaged in a far reaching and consequential attempt to alter its administrative structures operating in the rural areas. These have been some of the most elaborate and developed, although surely not efficient and productive, set of administrative structures in Africa. Yet there is a widespread recognition within Senegal, among Senegalese policy makers, donors, and producers, that fundamental alterations in responsibility for farm inputs, credit and seed, and marketing will have to take place. Any discussion of food self-sufficiency and greater productivity in the rural sector must take account of the questions of decontrol and commercialization in Senegal's rural sector. Thus to the analyses of risk, private initiatives, both domestic and foreign, and trade issues must be added an analysis of the potential for reform of the administrative structures for rural development and agricultural growth in Senegal. Again we believe we are well placed to carry out such studies through our interdisciplinary team at Princeton and in collaboration with Senegalese scholars and officials.

II. Institutional Aspects of the Development and Implementation of Agricultural Strategy.

When nations, LDCs or others, announce development strategies, set priorities, and allocate investments, it is only natural that dominant policy makers try to propagate an image of unanimity and immutability. But these policy packages are the result more of bargaining among institutional and less formal interests than of consensus, and as such tend to be fragile. As the economic situation they claim to address changes, for good or ill, the policies are changed or scrapped.

It is important in the case of Senegal to have a clear picture of the institutional balance of forces that leads to policy design for the rural areas. To come up with that picture would require some or all of

the following steps listed in Sections A through E.

A. Draw lessons from the four major phases of rural growth strategies to date:

1. 1959-62 -- the socialist-oriented strategies of rural transformation, aimed as much at equity as at increased production. Why was this judged a failure? What conclusions were drawn from it? What institutional actors felt that it was not mistaken?

2. 1962-72 -- the productionist phase with an emphasis on efficiency and the regrouping of the agricultural sector into large administrative and production units. What, other than the Sahelian drought, called this approach into question?

3. 1972-79 -- an effort was made through the Administrative Reform of 1971 to return some administrative and political power to regional and sub-regional units. In terms of production and standards of living, however, the situation continued to deteriorate. Was it a question of local leadership at the level of the commune rurale not understanding the powers at their disposal, or of over-zealous sous-prefets unable to work with local groups in a cooperative spirit? (Geller's work will be useful here)

4. 1979 -- the Plan de Redressment contains policies that would hasten decentralisation, reorganizing and revitalizing the coops, overhauling large intermediate institutions such as the RDAs and ONCAD, and working primarily with small groupes de producteurs. Is this a return in part to the philosophy of the 1959-62 period? Is it the first step in the retreat of the public authorities from the agricultural sector?

B. An assessment of the goals of institutional actors

At the broadest level outside observers have difficulty in seizing the true direction of the government since 1978/80. Don Brown posits that the Plan de Redressment calls for "the progressive disengagement of the government from the economy, particularly in the rural sector." Geller presents a very different view: "Most GOS cadres are anti-business, especially commerce. Their attitudes are not likely to change. Hence, there is little likelihood of "unleashing" free market forces in the near future. Government regulation is thus going to remain a feature of Senegal's economic institutional structures for quite some time."

It is probable that current plans will bring about a regrouping of governmental efforts rather than a retreat. The crux of the matter lies in elaborating a strategy for regrouping, and the strategy for that regrouping will be the result of intense bargaining among institutional actors, including the ruling party and the Brotherhoods.

It will be essential, therefore, to map these interests and detail their images of past problems, successes and failures, and their remedies for the future. An attempt must be made to assess their relative weights in the bargaining process.

C. Target Groups and Levels

Institutional actors will have preferences for aiming at specific groups as the best operating units in effecting policy goals, and will select the instruments of intervention according to the nature of the group or level.

There appears to be some preference, perhaps only rhetorical, for small clusters of cultivators, below the commune level. These are referred to vaguely as groupes de producteurs, or, in the case of the OMVS PID, hydraulic

units. How in fact are these groups likely to be composed? There will of course be marked differences by region and by the nature of rural production: Cassamance rice cultivators, peanut farmers, cattle raisers, participants in newly-irrigated perimeters in the Fleuve, etc. Target groups and policy instruments will and should vary according to these regional and production characteristics.

Beyond such variations, however, is the question of whether or not the groupes de producteurs will be anything more than a mask for the local notables that Carvin and others feel most benefitted from the 1971 administrative reform. This question must be understood both for its equity implications and because other proposed policies may in fact enhance the power of local notables.

Thus it will be important to understand if the government wants to work with existing interests and local power structures (for example the OMVS PID talks of encouraging clan/village/cooperative participation) or if it will seek to erode or break them up. If the latter, the question then is, how?

D. Instruments.

There is not yet a consensus among Senegalese planners on the best instruments, administrative or other, for implementing policy. There will probably continue to be a great deal of tinkering with the system. Other components of this proposal will deal with the economic implications of these instruments; this component intends only to address some of their political implications.

1. Pricing and marketing. There will continue to be strong public participation in both processes although market forces and the private sector are slated to play a growing role. What will be the impact of that course? For example, how will the two-track pricing system whereby the government sets prices for export crops and allows the market to determine the price of local food crops impact on various segments of the society? Will there be a flight from export crops? Will the government have to "indenture" peanut growers to their crop? What will rapidly rising food prices mean for the urban poor? If the pricing of inputs, including eventually fertilizers, is to be left to the market, who will be able to afford the inputs? What interests will supply them? As more marketing functions devolve upon the private sector, who will assume them? These questions should be linked to those in Section C. We shall seek not so much to answer them as to ascertain how Senegalese policy-makers assess them.

2. Credit. How will the terms, volume, and private/public mix of agricultural credit be determined? What will be the leading criteria for public credit and who will be able to meet them?

3. Institutional levels. Where will financial resources and extension efforts be directed? -- to groupes de producteurs? cooperatives? CERPs?, communes rurales? RDAs? Will the sous-prefet continue to be the linchpin between policy from Dakar and local implementation?

4. Performance criteria. There is an unmistakable emphasis, flowing from the overall economic crisis, upon efficiency and orthodox cost-benefit criteria in assessing investments and project performance. The government may enter into performance contracts with parastatal organisms such as the RDAs, and it is claimed that investments of any magnitude (\$500,000+) will be subject to strict cost-benefit analysis. Can these concerns be made

compatible with concerns for equity and the greater involvement of small underfinanced producers in the development effort?

E. Performance Goals.

The most difficult task facing the Senegalese Government will be in reconciling several fully legitimate but potentially incompatible goals:

1. increased agricultural production -- what cultivators or agents (state farms? foreign agribusiness?) are most suited to bring this about now? What will be the cost to the less-suited?

2. increased exports of agricultural products -- what price incentives must be introduced to promote such exports and what are the trade-offs in terms of local food production?

3. reduction of imports of agricultural products -- is this to take place largely through increased rice production and the vulgarisation of millet consumption?

4. making subsistence agriculture more viable -- can this be done short of subsidizing a sector characterized by low productivity?

5. servicing the needs of urban populations for cheap food -- what is the degree of political risk involved in not servicing these needs?

To reiterate the basic strategy involved in this component of the project -- it is not to produce answers to the questions posed, but rather to develop a detailed picture of the institutional actors that will produce answers of their own and to ascertain what they believe the relevant factors are in setting priorities. Finally, an estimate of their relative weights in the policy process will be made.

We now turn to the economic analysis component of our study where questions noted above will be analyzed with regard to production choices in the context of trade and risks.

III. Uncertainty and an Economic Strategy for Senegal

1. The Problem

The dominant sector in the Senegalese economy, agriculture, is exposed to large uncertainties from several sources. First, extreme variability in climatological conditions from year to year make the output of crops highly variable (see, for instance, Niane, 1980). Second, world price fluctuations create uncertainty about the terms at which the export crop, peanuts, can be traded for foodgrains and other imports. Recognition of the uncertain nature of the Senegalese economic environment raises questions about implications for economic policy.

2. Scope of the Analysis

An understanding of the implications of different types of uncertainty for Senegalese economic policies requires both theoretical and empirical research.

The theory of decision-making under uncertainty is not so well developed as to provide immediate answers to many questions raised by the Senegalese situation. Crucially important to making any theoretical research enlightening for decision makers will be the strategy choice of assumptions appropriate to Senegalese conditions. The development of this theory can be informed by the work of other analysts who have previously described the economy. A selection of the works cited in Kostinko and Dione (1980)

will be particularly valuable in this regard. An outline of proposed areas for theoretical investigation is contained in the next section of this proposal.

Informed policy making, however, requires more than a highlighting of relevant issues at the theoretical level. Knowledge of the actual magnitudes of different phenomena and of the quantitative impacts of different policies is also needed. The empirical work necessary to provide this information is limited by the data available on the past operation of the Senegalese economy. At this stage it is too early to know how far this type of empirical work can be pursued. A proper inventory of Senegalese data resources is extremely time consuming and can only be undertaken in Senegal after discussions with Senegalese researchers and government officials. In Section 4 we outline a number of possible empirical projects, their data requirements, and comment on their probable feasibility. We are confident that some significant empirical research is possible.

3. Theoretical Research

Uncertainty is an especially important problem in Senegal due to the absence of well developed capital markets in which individual farmers can diversify risk. With no opportunities to buy insurance, producers are likely to choose their techniques and affect the allocation of resources in such a way as to lessen their exposure to risk. Thus, the classical arguments for free trade may fail to hold in the absence of well-functioning markets to share risk (see Helpman and Razin, 1979).

Several policies have been proposed to allow Senegal to deal with the problems associated with instability. First, it has been suggested that Senegal follow a policy of import substitution aimed at achieving self-sufficiency in food. We propose to investigate the issue of optimal trade policy in an environment without risk-sharing markets. In a

country like Senegal commercial policy can be used to provide insurance to producers who otherwise are exposed a great deal of risk. The cost of such a policy are the usual ones; interference with production incentives causes a misallocation of resources. There are different short-run and long-run potentialities for commercial policy as insurance. In the short-run, commercial policy affects only the allocation of mobile resources, such as labor (see Eaton, 1979). In the long-run the allocation of land to the various crops can be affected as well. The optimal degree of import substitution may also depend on the relative contributions of terms-of-trade variability and weather variability to overall uncertainty, as the former exposes consumers as well as producers to risk, whereas the latter does not.

Integration into international capital markets offers a vehicle for the provision of the required diversification of risk. One way in which Senegal could achieve such integration is by encouraging foreign direct investment in Senegalese agro-business. It may be possible to analyze the gains to host countries from direct investment when domestic risk-sharing markets are absent. In such cases the return to foreign capital will represent both the physical productivity of the factor invested and the amount of risk that is borne by foreigners. This may yield larger than normal gains to the host country, since foreigners with their well-developed capital markets are sure to have a comparative advantage in risk-bearing.

A related opportunity for smoothing year-to-year variability in the economic situation of Senegal is to provide by financial borrowing from the Eurodollar market. Eaton and Gersovitz (1980, 1981a, and 1981b) have undertaken considerable research at both the theoretical and empirical level into certain aspects of this type of problem. Further theoretical

research seems justified by the particular question of resource allocation between crops and sectors suggested by the Senegalese case.

Another option available to Senegal is to develop a buffer stock program. This program could be an integrated one implying cooperation with some of its neighbor countries. One question that may then be posed is: which set of countries would form the optimal group for such a buffer stock. This question bears some similarity to earlier ones posed in the international economics literature concerning optimal currency areas and optimal customs union size. In this case an important consideration seems to be the correlation of the weather patterns across countries, as well as the correlation of world prices for the major export crops of the various countries. Regional buffer stocks may provide a useful institution for a group of LDC's to supply insurance for each other.

The riskiness of economic activity in Senegal may have important implications for different types of investment projects. For example, irrigation works affect not only the average level of output, but also its variability. Similarly, transportation improvements have an important role to play in a situation where different regions of a country may alternately be in surplus and deficit with other regions. The profitability of processing agricultural output for export may also be affected by conditions of riskiness.

An unorthodox proposal to deal with risk is to set up an international insurance scheme. It may be difficult to insure output because monitoring procedures would be required to ensure that they do not systematically reduce inputs and then claim a shortfall due to bad weather. However, it should be possible to insure weather directly. For instance, an international insurance company like Lloyd's could promise to pay certain amounts to Senegal depending on the level of rainfall as measured over

a certain period at a certain place. In return, Senegal would pay an insurance premium. We propose to investigate the feasibility of this program.

Several of the preceding proposals may depend on the nature of Senegal's relationship with its neighbors. For instance, tariff policies which might otherwise be attractive in dealing with uncertainty may become unusable if crops can be smuggled in and out of Senegal from neighbouring countries. The economists involved in the project will leave to the political scientists the analysis of the political determinants of this cooperation. However, the economic analysis can provide valuable insights into the types of cooperation required and the associated gains, and we intend to explore these issues.

The large projects proposed for OMVS development make all the more essential consideration of cooperative arrangements with Senegal's neighbors.

A final important set of issues to consider in the context of all of the above proposals is the interaction of risk and the design of these proposals with the organization of agriculture. There may already be traditional institutional arrangements in Senegal which mitigate the effects of risk. For instance, Moslem brotherhoods are organizations which involve the coordination of individual producers. Rural families may have members in urban areas who can participate in the pooling of income generated outside agriculture. Analysis is needed to see how these traditional organizations have altered the nature of risk in Senegal and how best to design national programs to complement these institutions.

4. Empirical Research

In the context of this research proposal, two types of data sets are valuable, each providing a different perspective on the behavior of the economy and allowing projections of the response to policies.

Aggregate data can be used to build a small model of the operation of the economy as a whole. This model would be similar in conception and size to, but quite different in formulation from, the first macro-econometric models of the U.S. Production in the groundnut, rice, millet/sorghum and non-agricultural sectors would be related to the use of inputs (land, labor, capital, fertilizers, water and meteorological conditions) in these sectors. The demand for the output of these sectors and imports depends on prices, incomes and other variables such as population and its composition. The effect of various price controls and possible black market operations would require special attention given the past history of Senegalese agricultural policy. These relationships would be estimated using annual time series data at least as far back as independence. Many of these time series are easily available in the U.S., others should be obtainable in Senegal.

Using this aggregate model, estimates can be made of the costs of different types of uncertainty. It will also be possible to evaluate a number of policy experiments suggested by the theoretical research described in Section 3.

While the aggregate model is important in indicating gross magnitudes, it can say little about the finer detail of economic behavior. To what extent do different areas of the country suffer the effects of uncertainty with different intensity? In particular, how does the experience of irrigated areas contrast with that of unirrigated areas? How does the

experience of areas with poor transportation contrast with that of more accessible areas? What are the magnitude of the implied returns to investments in irrigation and transportation? How have traditional organizations been able to cope with risk?

These are some of the questions which can only be answered using detailed micro surveys providing information on individual farms and farm families. This type of data may be available for some regions of the country in special studies such as evaluations done by ENEA in its beneficiary survey and from USAID's small irrigated systems. A national agricultural census may soon be completed which could be of great help. We are dependent on others for these data and can only know about availability after discussions in Senegal with appropriate people and in discussions with colleagues at Purdue, Michigan State and other U.S. institutions that have received USAID support for work on Senegal.

IV. Personnel

The Research Program in Development Studies has a team of political scientists and economists who have carried out their own extensive work on problems of economic and political development and trade in many developing countries. Professor Henry Bienen, Director of RPDS, has worked for many years in Kenya, Tanzania, Uganda, and Nigeria. He participated in the Joint Assessment for USAID, Dakar. Professor John Waterbury has worked in Morocco and Egypt and has excellent French and Arabic. Professor Waterbury hopes to spend the year in Senegal from September 1981 - June 1982. Professor Mark Gersovitz has worked in Zaire, Nigeria and Mexico. He was born in Montreal and is French speaking. Professor Joseph Stiglitz worked in Kenya. He is a prominent economic theorist and student of economic development.

Professor John Lewis, former USAID Director in India, former Dean of the Woodrow Wilson School and presently head of the Development Assistance Committee of OECD will return to Princeton in August, 1981. He will be an invaluable participant in our work. Professor Gene Grossman and Professor John Eaton are economists who have done important work on trade and risk.

There will also be at the Woodrow Wilson School a significant number of regular staff and visitors with strong interest in development and agricultural strategies. A great resource is Sir W. A. Lewis, Nobel winner in economics, who is a constant participant in our seminars and intellectual work.

Professors Bienen and Waterbury will have large responsibility for political and institutional analysis and the economists will be responsible for economic analysis. But we have found a great deal of interdisciplinary

effort has gone on in our past empirical work on income distribution in Turkey, Egypt, Mexico and Nigeria. The large income distribution projects, funded by USAID, show that RPDS can produce high quality policy-relevant research under difficult conditions. The studies were collaborative efforts with large groups of scholars from Turkey, Nigeria, Mexico and Egypt. We have every confidence that we have a group that can work productively in Senegal, in harmony with Senegalese institutions and scholars.

V. Output

Our intention is to produce a set of papers, and possibly a book, that will make major contributions to the scholarly literature on development strategies and on Senegal. Above all, we intend to produce policy relevant work for thinking about the critical problems and options for Senegal over the next decade. This work should be policy relevant for Senegalese policy makers as well as USAID and other US Government officials. We would expect a wide reading from academics worldwide as has been the case with our other work.

We stand ready, as we did during our income distribution projects, to make work available to Senegalese and U.S. analysts as we go along. We will hold meetings in Dakar and Washington, if desirable, to make our progress known to the policy community.

We will also be happy to make work known to international agencies such as the IBRD, IMF, various development banks and donor institutions. Other academics can, of course, have access to our work where appropriate.

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