

**REPORT ON THE MONTPELLIER SEMINAR ON
"THE FUTURE OF AGRICULTURE IN
SAHELIAN COUNTRIES"**

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PREFACE

The following report was written by John H. Eriksen of Ithaca International Limited, 707 Cayuga Heights Road, Ithaca, New York. It is submitted in completion of the Terms of Reference under AID Contract No. AFR-0510-0-00-0038-00 dated 9 July 1990. The consultant attended the sessions of the Montpellier seminar and interviewed participants during the period 11-15 September 1990. The report was written during the period 16-30 September 1990.

The consultant wishes to express his appreciation to those seminar participants who were kind enough to share their ideas and impressions with him during and after the seminar. He assumes responsibility for any errors in misinterpretations of the formal presentations at the seminar, the remarks of the panel discussants, and/or contents of informal discussions and interactions with participants.

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THE MONTPELLIER SEMINAR REPORT
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I. SYNOPSIS OF SEMINAR PROCEEDINGS

The terms of reference under which this report was to be written stated that the intention of this section was to synthesize the information presented at the seminar and to try to identify the source(s) of key disagreements between the North American and European points of view. Given the course and contents of the seminar in Montpellier, these tasks have proven difficult for two reasons. First, the seminar had eleven major presentations on rather disparate topics, with formal responses by discussants and, in some cases, questions and comments from the general audience. This considerable body of information proved difficult to sort and synthesize. Second, the seminar sessions and corridor discussions were characterized more by their amicability and apparent convergence on the main ideas, than by any major disagreements between participants.

To accomplish the first task and at the same time do justice to the contents of the different seminar presentations, I have summarized the individual presentations in the next section. To attack the second task, this first section is devoted to isolating what were the main themes and findings of the seminar.

One of the main themes of the seminar revolved around contrasting approaches to development which have prevailed in the Sahel since the earliest days of the French colonial period. Giri characterized these as the Baron Roger -- i.e. state interventionist -- approach versus the Governor Protet -- i.e. laissez-faire -- approach. He related how the alternative approaches had been variously applied by governments -- colonial and independent -- through almost two centuries of "development effort" with differing degrees of success. And, he summarized by pointing out the deficiencies of sole dependence on either of these ideological approaches to Sahelian problems.

Griffon of CIRAD carried this theme further in his concluding remarks when he observed that the sense of the seminar was that the participants had arrived at the end of certainties about the efficacy of one or the other approach to Sahelian development. The complexity of the situation, he said, dictated a need for pragmatism and flexibility in approaching the problems. Acceptance by participants of this theme of greater modesty in the face of complex problems and more reliance on empirical analysis, rather than ideology, in seeking solutions, was perhaps the single most important outcome of the seminar.

The theme was reflected in several of the individual presentations. Egg and Igue observed in their presentation on regional markets that it was time to broaden the concept of the "espace regional" to focus not on creation of a protected regional market per se but on how disparities and distortions in trade and other policies between states could be resolved to promote freer and more efficient markets. A corollary to this was that greater stress in analysis and planning should

be placed on exploiting the opportunities for mutually beneficial trade presented by regional markets in West Africa. And, finally, the authors continued the themes presented at the Lome seminar in 1989: that a series of de facto regional -- and largely parallel -- markets already existed within West Africa; that they were organized and managed by effective networks of private entrepreneurs and traders, who were often oriented toward capitalizing on intraregional disparities and distortions introduced by governments; and that the major obstacle to improving the functioning of these markets was the inability or unwillingness of governments in the region to start the process of removing barriers and disparities to trade and harmonizing their approaches to agricultural and commercial policies.

The second theme at the seminar was the apparent inevitability of CFA franc devaluation(s) as a necessary --if regrettable -- instrument in the macroeconomic adjustment process. Devaluation was discussed openly and without rancour. While it could not be said that any consensus was reached on the issue, there appeared to be a perceptible shifting away from reiteration of the theoretical merits and demerits of devaluation as policy instrument in the abstract to more serious empirical analyses of the possible effects of devaluation(s) on the Sahelian countries -- and, in this case, specifically on agriculture in the Sahel. With discussion was coupled in several instances with tacit admissions that the "second-best" measures adopted by francophone governments in West Africa to control their real exchange rates without devaluation either had already failed or were unlikely to be sustainable beyond the near term.

There seemed to be general agreement among the participants that the French "filiere" approach provided a good analytical base for study of agricultural constraints and supply response for the major export -- and import substitution -- commodities. That is, the approach forced one to consider the complex interactions between different levels of a given agro-industrial commodity network and this increased knowledge of the total process assisted greatly in identifying and prioritizing interventions to stimulate growth.

There was a good deal of discussion on the effectiveness of agricultural producer price incentives as the principal means of promoting agricultural supply responses -- in aggregate and by individual commodity. The general consensus appeared to be that, while favorable producer prices are a necessary condition for growth in agricultural output, they are not a sufficient condition. Several participants related instances where the potential benefits from improved agricultural pricing policies had been diminished or negated entirely by contradictory government policies in other areas or by the actions of market intermediaries.

Participants stressed repeatedly the need for balance approach to Sahelian agricultural development. That is, accelerated sector development in context of a sound macroeconomic climate, adequate price incentives for farmers, and producer access to new crop and livestock technologies, necessary inputs, stable markets, and essential agricultural support services.

Role of risk in diminishing agricultural supply response(s) under Sahelian conditions was the subject of one session -- and was cited as a constraint in several others. Participants discussed several different types of risk faced by farmers and market agents. Among these were the

variability in outcomes for technical packages, the variability in prices for agricultural inputs and commodities in local markets, the financial risks embodied in using new technologies under Sahelian conditions of low and variable rainfall, the market risks of operating in environments where contracts are not respected and injured parties have limited or no effective recourse to the judicial system. These sessions introduced the general perception that various types of risk had to be explicitly recognized and analyzed in planning agricultural research and development efforts in the Sahel.

Delgado presented an interesting survey on the recent evolution of comparative advantage and domestic resource costs for several major export commodities in the Sahel. By decomposing and analyzing the evolution of the components of domestic resource cost calculations over the 1970s and 1980s, he showed that these individual major components affected the competitiveness of Sahelian export commodities -- cotton, groundnuts and live cattle -- in quite different ways during the two periods. Overvalued exchange rates and the rising opportunity costs for domestic resources used in Sahelian agricultural production and export marketing were seen to have played large roles in the declines in export competitiveness for cotton and live cattle and the variable in the competitiveness of groundnuts in the 1980s.

A second point in this presentation was that Sahelian governments have generally been unable to control domestic prices for cereals and, since cereals are such important wage goods in all Sahelian economies, governments do not have the ability to closely control effective wage rates. This implies that governments will have substantial difficulties in trying to control their real exchange rates by resort to wage and price policies alone, in the absence of currency devaluation.

Delgado's third point was that the need to restrain growth in the costs of agricultural labor, coupled with the potential cross-effects of increased Sahelian cereals production on livestock enterprises, demands that domestic cereals prices be kept relatively low and that the means be found for increasing factor productivities in both cereals and export crop production.

The problem of increasing demographic pressures on Sahelian resources was raised in several contexts during the seminar. Faye pointed out that rapidly growing population pressures on finite crop and grazing land resources in the Sahel had increased the need to develop different approaches to land ownership, tenure and management. Policies must be put in place to provide incentives for private investment -- individual and group -- in land resources, while protecting the rights of disadvantaged groups within villages. Moreover, while the prevailing policies of state ownership and management of natural resources in the Sahel have not succeeded in either protecting those resources from overexploitation or providing incentives for sustainable development by local populations, complete privatization of ownership by individuals has other deficiencies. Therefore, some mixed system of government, village and individual ownership and tenure must be tailored to specific Sahelian situations.

The need for greater decentralization of public responsibilities and resources, coupled with the need to stimulate genuine local development dynamics, was discussed. Mercoiret isolated several key factors which lead toward creation of a genuine local dynamic. They included:

1. The existence of a "espace d'initiative";
2. The lack of top down approaches in development;
3. The existence of high stakes in the technical and economic sense for local groups;
4. The existence of local leaders; and
5. The existence of external stimuli for development.

In sum, then, the Montpellier seminar made progress in orienting future efforts in the direction of more empirical, less ideological, approaches to Sahelian agricultural development. It also made progress in recognizing the need for more integrated approaches to research which would better utilize the contributions of economists, agronomists, ecologists, and social scientists in jointly attacking key problems. The seminar participants also felt that a great deal more work was needed to improve effective communications between researchers and decision-makers, particularly in instances when research findings and recommendations were being presented and their implications for development policy discussed.

Hanrahan provided a most useful summation in stating that more work by all disciplines was needed to:

1. Define effective agricultural strategies for Sahelian situations;
2. Redefine the effective role of the Sahelian state in development;
3. Broaden the concept of the "espace regional";
4. Forecast the probable impacts of CFA franc devaluation(s) for specific Sahelian countries; and
5. Facilitate regional harmonization of agricultural and commercial policies between countries in different West Africa markets.

II. ISSUES PRESENTED AND DISCUSSED DURING THE MONTPELLIER SEMINAR

A. The Effects of the Politics of Structural Adjustment on Agricultural Development.

The discussion of the politics of structural adjustment was initiated by Dr. Jacques Giri of SEED who provided an historical perspective of the underlying development strategies which have been operative in the Sahel over time. He illustrated these strategies by contrasting the approaches of two of the earliest actors in Sahelian development. He contended that the approach of Baron Roger -- the governor of the Senegal colony in the 1820s -- typified the dominant development philosophy throughout the colonial experience and through most of the post-independence period.

This approach stressed determined efforts to "projectize" external assistance starting with the first attempt to introduce new crops and improved cultural methods in production of cotton and indigo in Senegal. In reviewing the failure of this early approach, Giri extracted from what was perhaps the earliest evaluation of a Sahelian project certain themes which were to be repeated over and over again in the future -- i.e. excessive external expenditures which yielded few tangible results; introduction of new crops and agricultural techniques without sufficient on-site experimentation; a lack of persistence by the innovators; the failure to take Sahelian climatic conditions into account in planning; and the "lack of motivation" imputed to local farmers.

Giri then contrasted Baron Roger's approach with that of Governor Protet in 1847. Under this governor, emphasis was placed on fostering an indigenous response to production of groundnut products by providing access to international markets and financing development of modest local infrastructure needed to evacuate the groundnut crop from Senegal and Gambia.

The contention in presenting these contrasting approaches was that, while the first was "un excellent moyen de depenser beaucoup d'argent pour peu de resultats", the latter, while being less costly and yielding better results, also had certain limitations. Giri stated that the Protet approach was flawed in that it resulted in a temporary period of relative prosperity but did not change the underlying structure of production or yield productivity increases. He saw that, while groundnut production increased significantly, farmer productivity remained unchanged, the inherent productivity of the land was undermined, and, as old fields declined in fertility, a pattern of increasing production through the expedient of expanding the hectarage under cultivation was set in place.

This failure to increase unit productivities in returns to either labor or land progressed to the point where Porteres in 1952 classified Senegalese agriculture as a "systeme de production d'agriculture de rapine". It led to a stagnation in labor productivity at a time when population pressures on the land were beginning to increase dramatically and introduced factors leading directly to the decline in competitiveness of groundnut production evident in the 1980s. By the end of the colonial period, the mediocre results of the existing agricultural policies were evident. Neither the export and food crop sub-sectors were characterized by increasing labor productivities and

crop yields were not improving.

Giri went on to say that independence brought few essential changes in agricultural policies. He contended that Hart, in his book Agricultural Policies in West Africa, was essentially correct in stating that the main result of agricultural policy-making after 1960 was that "decolonization has rearranged some of the actors and redistributed some of the benefits" without changing the underlying structure. The new governments replaced European commercial agencies with national offices charged not only with public marketing but also with responsibilities in supervising and directing farmers.

These public agencies to justify their involvement in rural development glorified a spirit of communal action as the "African way of development" in opposition to the Western bias toward individualism. But, Giri states, the underlying policies in Sahelian agricultural development did not change. Great stress was still placed on export crops, which yielded both foreign exchange earnings and local tax receipts, to the detriment of food crops. And, the approach of Baron Roger was never more honored than during the post-independence period when, with external donor assistance, a growing portion of available resources was devoted to development of costly infrastructure projects -- particularly irrigated perimeters -- and attempts of graft modern agricultural techniques into local systems of production.

Giri cited the development of the Office du Niger was an instructive example of a situation where changes in the language of development did little to affect a fundamental reorientation in development policies. He stated that "les formules d'incantation changent, mais les methodes de coercion pour obliger les producteurs a se plier aux imperatifs de l'entreprise ne le cedent en rien aux methodes coloniales et les resultats ne sont pas beaucoup plus concluants".

Giri then contended that the only exception to this general pattern of agricultural stagnation was the development of the Sahelian cotton industry. In this case, research efforts provided the base for introduction of new cotton varieties and cultural methods which were well adapted to Sahelian conditions. Moreover, an efficient organization was put in place to provide necessary inputs and to explain to farmers how to use them. And these factors, combined with access to a growing international market, combined to foster farmer adoption of a new production system.

Giri concluded his summary of early post-independence period by noting that demographic pressures and the growing rural exodus made it increasingly evident that Sahelian agriculture would have to adapt to the changing conditions. If it did not, then the experience with cotton development would remain "un ilot dans un ocean ou la productivite du travail agricole est quasi-stagnante, ou la fertilite des terres ne s'ameliore pas et a au contraire de plus en plus tendance a se degrader".

Finally, in reviewing the period since the major drought of the early 1970s, Giri pointed out the rapid changes in development strategy on the part of both Sahelian governments and external donor agencies. During the 1970s, after short-term relief efforts gave way to longer term development considerations, concentration was focussed on existing systems for crop and

livestock which were alleged to be incapable of adapting themselves to changed conditions. Great stress was placed by governments and donors on introducing farmers to more efficient cultural practices to raise yields and increase unit productivities to ensure food self-sufficiency and general economic growth. The underlying assumption was that massive new -- and, largely, public -- investments in agricultural research, extension and complementary infrastructure were all that was needed to affect the necessary increases in agricultural production.

Sahelian farmers and livestock producers were seen as fundamentally no different from their counterparts in other parts of the world in that they would accept agricultural innovations they deemed to be in their interest. Moreover, the prevailing attitude was that Sahelian governments had not given rural development activities sufficiently high priority in the areas of investment, pricing policy or farmer support services. Far from questioning the involvement of public agencies in rural development, most development strategies for the region assumed that governments had to become more deeply involved, albeit with resort to an improved set of sectoral policies and greatly increased external donor support.

In sum, then, Giri observed that the hand of Baron Roger was never more in evidence than in the 1970s. External aid to the Sahelian countries increased rapidly and the number of projects grew commensurately. The development of irrigated agriculture continued to be the "enfant chéri" of the donor agencies as it had been during the colonial period and investments in the sub-sector exceeded those on all of agricultural development activities combined. And, during the decade, Giri states that it was "plus difficile de faire évoluer les politiques que de multiplier les projets".

In the early 1980s, however, there emerged a feeling among donors that Sahelian agricultural production systems had been very slow in responding to the intense efforts of the past ten years and the productivities were still very low. Statistics showed that the region was moving farther from -- rather than toward -- the goal of food self-sufficiency and that degradation of the natural resource base was accelerating. And, finally, collective donor experience showed that, even where individual projects were deemed successful, they were generally too small and isolated to have any real impacts on the general Sahelian situation.

Amid this general discouragement and disillusionment with Sahelian development, a new strategic element -- structural adjustment -- was introduced. The Sahelian structural adjustment programs, according to Giri, were put in place to reestablish macroeconomic equilibria and to recreate favorable conditions for economic growth. The disequilibria were attributed to economic distortions introduced by the Sahelian governments themselves. The solution adopted was to eliminate the distortions through elimination of monopolies given to parastatal marketing agencies, discontinuation of official price fixing by governments, and liberalization of input and commodity markets. This was, in sum, according to Giri, an attempt to recreate the conditions advocated by Governor Protet in his approach to Sahelian development.

Over the decade, many of the distortions which were the target of structural adjustment programs have been eliminated. Monopolies have disappeared. Official prices have given way to prices

determined in open markets. And, private traders have been allowed to play a more important role in Sahelian markets. Giri contends, however, that, at least until now, one has not seen any impacts of structural adjustment on farmer adoption of new agricultural techniques or on productivities in the sector. He states that numerous studies have clearly shown that soil degradation is still a reality, that extensification of crop culture is still the rule in most of the Sahel, and that even animal traction where adopted has not led to the expected improvements in labor productivities. He concludes that "pour autant qu'on le sache, on ne voit pas que la liberalisation ait provoqué l'inflexion de ces tendances inquiétantes" and that "au fur et à mesure que le temps passe, il devient clair que la liberalisation n'a pas été suffisante".

In giving his opinion that structural adjustment programs have had only partial success in improving the economic environment in which Sahelian farmers must operate, Giri further stated that the alternative proposals of the late 1980s to redress the differences between Sahelian and international markets by creating a "espace régional" or devaluing the CFA Franc have thus far met with even less success. He attributed this lack of success in the first instance not only to the fact that protectionism runs counter to the prevailing liberal doctrine of the major donors but more importantly to a lack of political will among the involved West African governments. With respect to devaluation, Giri concluded that "l'idée de dévaluation du Franc CFA n'a pas eu plus de succès, se heurtant à la fois à l'opposition de tous ceux pour qui la parité du Franc CFA a été fixée pour l'éternité par Dieu le Père lui-même et au manque d'enthousiasme de élites sahéliennes".

In summarizing his historical perspective, Giri concluded that fundamental changes are needed in the Sahel to create an improved environment for agricultural development. Whereas the approaches of the past have oscillated between the technocratic approach of Baron Roger and the more liberal *laissez-faire* approach of Governor Protet, both approaches have been essentially imposed from outside the Sahel. He is of the opinion that "à ce jour, ils n'y sont pas parvenus et comme on a encore rarement vu une société humaine céder à une révolution imposée du dehors, il paraît douteux qu'ils y parviennent" and he asks the questions "La révolution peut-elle venir d'ailleurs que des sociétés sahéliennes elles-mêmes?" and "Quand adviendra cette révolution et quand sera-t-il possible de mettre en place un cadre où les producteurs puissent à la fois spontanément répondre à la demande du marché (l'approche du Gouverneur Protet) et adopter des techniques plus performantes (l'approche du Baron Roger)?"

The second paper on the effects of structural adjustment programs on Sahelian agriculture was presented by Drs. Patrick and Sylviane Guillaumont of CERDI. The authors prefaced their discussion of the topic by saying that it had proven difficult to isolate and measure the impacts of structural adjustment on agriculture because agricultural sectors in African countries, more so than other sectors, are subject to the effects of many exogenous factors and because the lag times between initiation of incentive measures and a supply response from farmers can be rather long.

To illustrate this point, the Guillaumonts reviewed average growth rates in agriculture (value-added and per capita food production) -- for several groups of African countries. They found that, while average agricultural growth rates in African countries in the 1980s were generally

lower than the average for all developing countries, within Africa the sectoral growth rates of Sahelian countries were better than those attained in the 1970s and better than the average for all Africa countries. When the authors compared the performances of African countries with structural adjustment programs of longer than three years with African countries with either no programs or programs of less than three years, they found that, because the figures could not be purged to eliminate the effects of exogenous factors, they did not provide a statistical basis for any conclusions. The authors, therefore, concluded that, based upon these statistics, one could not reject the hypothesis that structural adjustment policies had favored agricultural growth in African countries.

The Guillaumonts pointed out in their paper that structural adjustment in theory consists of two principal elements: reduction in a balance of payments deficit at the same growth rate or increase in a growth rate commensurate with a certain balance of payments deficit. Neither change can be obtained without modifying a country's production structure to favor export and/or import substitution goods. The changes in a market economy are obtained through increases in the competitiveness of these goods and this, in turn, is accomplished either by changing the relative prices of the goods in question or by increasing the productivity of the factors of production involved in producing the goods. Each of these factors (relative prices and productivity) has important implications for agriculture.

Increases in the relative prices for commodities in international trade is a priori favorable for domestic agriculture to the extent that the country in question produces large quantities of the commodity. In the case of the Sahelian countries, this applies not only to cash crops like cotton and groundnuts but to other crops: rice, maize, millet, sorghum and cowpeas. To the extent that structural adjustment programs succeed in changing relative prices for these commodities vis-a-vis other goods and services, it would constitute a reversal of the previous trend in deteriorating terms of trade for agriculture and mitigate against the pronounced urban bias of development in certain countries.

If structural adjustment programs manage to increase relative prices for agricultural products, then, in order to measure program effectiveness, one must know what are the effects of these changes on agricultural production -- and this has been the subject of many debates. The authors drew several conclusions from theory. First, the long-run supply elasticities for agricultural commodities are higher than those in the short-run, particularly for perennial crops but also for irrigated crops, where specific investments in infrastructure may be necessary. Second, in the short-run, supply elasticities for individual commodities will be higher than the aggregate supply elasticity since increases in supply of one commodity can arise from shifts out of production of other commodities. The aggregate supply response, on the other hand, is constrained by the overall availability of the factors of production and, if these are fully utilized, growth in aggregate supply can only come about through increases in factor productivity.

To foster sectoral growth, structural adjustment programs must work to raise relative prices through elimination of price distortions and to affect increases in factor productivity. The authors argued that agriculture, more than the other sectors, in developing countries is limited by the

availability of factors of production -- i.e. land and/or labor. Therefore, increases in factor productivity are even more necessary if one is to raise production levels. Increases in relative prices for agricultural commodities, if they increase enterprise profitability, provide the incentive for technical progress. However, the actual effects of favorable prices on productivity will vary because they depend not only on the behavior of farmers themselves but on government policies.

The authors contended that many factors determine growth in agricultural productivity including: health and education infrastructure in rural areas; agronomic research; agricultural extension; the state of road and communications networks; agricultural infrastructure; access to credit; etc.. For this reason, one is likely to see lags and variations in supply response(s) to the initiatives under structural adjustment. They also pointed out that productivity in agriculture can be influenced by the effects of structural adjustment on other sectors of an economy -- i.e. in lowering the costs of agricultural inputs or consumer goods, in reducing costs in agro-industrial processing and/or marketing.

In brief, then, structural adjustment in theory should favor agricultural development if it raises prices for agricultural commodities relative to other goods and services and affects increases in the productivities of factors used in agricultural production, processing and marketing. On the other hand, success in structural adjustment is defined as pursuing both of the objectives simultaneously while maintaining a country-specific macroeconomic equilibrium and this often involves difficult tradeoffs.

In this regard, the authors contended that structural adjustment programs involve a wide variety of policy instruments which differ between countries and also with respect to their relative emphases of reestablishing macroeconomic equilibria, correcting price distortions, and increasing factor productivities. The subsequent tradeoffs are not easy to sort out and can be favorable or unfavorable to agriculture.

Among the principal policy instruments used in African programs are devaluation to maintain parity, partial or complete price liberalization, and programs to reduce budgetary deficits through reductions in public expenditures and/or programs to increase public revenues. The authors, therefore, reviewed the possible impacts on agriculture in using these three policy instruments.

Devaluation has been used frequently as a policy instrument in structural programs, the exceptions being in the Franc zone countries and Liberia. It is generally considered to be an essential policy instrument because it permits adjustment in the relationships between tradeable and non-tradeable goods -- i.e. in the real exchange rate. Devaluation is aimed at increasing the profitability -- and, therefore, the quantity -- of export goods. It also affects the profitability of import-substitute goods.

The authors observed, however, that the theoretical benefits of devaluation are not necessarily always realized in agricultural production because:

1. The increases in prices for agricultural commodities are not always passed on to the producers because they are diverted by governments or market intermediaries; and/or
2. Increases in domestic inflation negate the benefits of the devaluation.

In addition, the authors pointed out that clear differences between countries using the devaluation instrument in structural adjustment and others are not easily observable. This is so in some cases -- e.g. Ghana, Guinea, Guinea-Bissau and Tanzania -- because of the complicating effects of strong parallel markets in situations of high inflation and strict currency controls. The Guillaumonts contended that the choice is also difficult with respect to the Franc zone countries because they have not experienced strong appreciations in their real exchange rates even without devaluation. This is so because they have benefited indirectly from the devaluation of the French Franc vis-a-vis other major world currencies and directly from domestic deflationary policies. In this, they have succeeded, according to the authors, in actually lowering their real exchange rates by keeping inflation in domestic prices lower than that in the rest of the world.

In this respect, there are important differences in the impacts of agriculture between the African countries experiencing devaluation and inflation and those with no nominal devaluation but with deflationary policies which lower the real exchange rate. In the former, the impacts of inflation are dangerous for two reasons. First, the savings of agricultural producers held as money are eroded by inflation. And, second, inflation creates a climate of uncertainty which works against innovation. In the latter, the impacts of not devaluing the currency have been to force the involved governments to lower taxes on export commodities -- i.e. cotton and groundnuts -- and to seek productivity increases through cost reductions in parastatal agro-industries -- i.e. cost reductions in transport, marketing and processing.

In general terms, the authors concluded that structural adjustment using devaluation as a policy instrument tends to have impacts primarily through its effects on real agricultural prices; whereas structural adjustment without devaluation can have impacts primarily through affecting changes in factor productivities within a commodity network -- i.e. filiere.

Structural adjustment programs in most of Africa have attempted to liberalize agricultural markets and prices to some extent. These efforts have been oriented primarily at removing price distortions as a factor affecting market performance. The authors stated that liberalization efforts had been most rigorously pursued with respect to food crops but they also said it was unfortunately difficult to determine the real impacts of such efforts, particularly in the Sahelian countries. This was the case because, while production of food crops increased significantly in the Sahel in the 1980s, it was difficult to isolate the effects of structural adjustment from those related to improved climatic conditions and, moreover, good price information was not available from all markets.

With respect to export crops, the Guillaumonts contended that the question of how to stabilize prices remains open, given the doubts raised by the poor performance of caisses de stabilisation

and marketing boards in the past. They believed that instability in prices for export commodities would without doubt act as a brake on innovation and investment. There was the feeling that some system was needed to introduce a certain level of stability in producer prices without completely severing the linkage between these prices and world market commodity prices. And, that this had to be accomplished by placing such a system outside the reach and influence of the government financial agencies.

Finally, structural adjustment implies in most cases a reduction of budget deficits. Increasing government revenues to resolve this problem has proven difficult in most African cases because the easiest target -- i.e. increasing taxation on traded goods -- is deemed in structural adjustment terms to be a major source of economic inefficiency. In those countries where devaluation has been a policy instrument, ex poste increases in taxation on exports and imports has tended to negate some of the expected benefits. This has also been true where fraud and other informal activities which raise transaction costs have not been rigorously controlled by governments.

Since most African governments have been less than successful in raising revenues, the authors saw structural adjustment efforts as devoted mainly to reducing public expenditures. The impacts of these cost cutting measures have not always been equally distributed. They stated that, because it was often politically easier to accomplish, capital investment budgets were often cut more deeply than recurrent cost budgets and, especially, budgets for personnel. In this regard, they believed that budgetary expenditures in agriculture had been particularly affected in that needed investments in infrastructure were often deferred and budgets for key support services, exclusive of personnel costs per se, were cut to the point where the services in question could no longer function effectively.

In sum, then, the authors concluded that in theory structural adjustment policies were favorable to agriculture in that they were aimed at providing price incentives and increases in productivity. The actuality, however, the benefits of structural adjustment could not always been easily identified because:

1. Agricultural enterprises in Africa have been affected by other exogenous factors -- i.e. changing climatic and world market conditions;
2. There are necessary lags between the initiation of structural adjustment policies and supply responses -- either on a commodity basis or in the aggregate; and
3. Country-specific adjustment programs use different combinations of policy instruments and these imply different emphases and tradeoffs between reestablishment of macroeconomic equilibria, changes in relative prices, and increases in factor productivities. In some cases, these tradeoffs have not always had optimal results for the development of African agriculture.

B. What Forms of Agricultural Production Have a Future in the Sahel? Under What Conditions?

The principal contribution on this topic was a paper presented by Dr. Christopher Delgado of IFPRI. The author started his discussion by observing that, in the second half of the 1980s, a widespread consensus had developed among Sahelian governments and external observers that growth strategies in the region needed to involve a revitalization of smallholder agriculture. This was necessary both to improve the well-being of those segments of the population most at risk and to provide the widespread growth patterns necessary to sustain the development process in the overall economy.

However, according to Delgado, the consensus breaks down once one goes beyond broad conditions for revitalizing agriculture. On the one hand, some analysts argue that the focus of development policy with respect to smallholder agriculture should be limited to creating the conditions necessary to the functioning of free input and output markets. In this view, no effort should be made to "pick the winners" with respect to commodities, technologies or regions.

A second group expresses the view that, while macroeconomic reforms are essential, there is also a compelling need in agriculture under African conditions to set priorities by crop, by region and by function. In this case, stress is placed on the central role of processes that cut unit costs of production -- i.e. technological change, infrastructure creation, and the development of institutions. These processes are seen as public goods in the early stages of development. Put another way, the necessary massive response of private investment in smallholder agriculture in response to favorable price incentives will be considerably speeded up by prior investment in key public goods.

Revitalizing Sahelian agricultural development will require, in Delgado's opinion, a vision of where public investment should be concentrated to facilitate the response of producers to alleviate the constraint on growth and food security of foreign exchange shortage. For this purpose, revitalization requires a set of commodity priorities for production-oriented investment and institutional commitment, based on an informed view of likely developments in all relevant commodity markets and in domestic production conditions.

In his paper, therefore, the author attempted to lay out a case for a specific list of commodity priorities for a major push to revitalize Sahelian smallholder agriculture, in the context of anticipated favorable reforms of the macroeconomic environment in the region, which might provide the preconditions for a positive growth strategy.

Based on a review of trends in Sahelian agriculture over the last twenty years, Delgado came to four sets of conclusions.

First, with respect to production performance, only rice and maize among the cereals seem to have done reasonably well, probably due to crop intensification efforts. However, at 3 to 5 percent of total cropped area in the region, neither crop can be the primary basis for a major

development strategy to revitalize Sahelian agriculture within any reasonable time period, even if improvements are useful at the margin. Moreover, cotton also seems to have done well in at least two countries -- i.e. Mali and Burkina Faso. Given the important share of cotton in the past growth of foreign exchange earnings, growth strategies need to consider the future potential for this crop. Similarly, although the recent performance of groundnuts has not been encouraging, he concluded that their great importance to several Sahelian countries -- particularly Senegal, Gambia and Burkina Faso -- mandates a closer look at why the crop has not been doing well.

Second, with respect to factor productivities, he concludes that the issue needs to be looked at much more closely using intensive -- and, necessarily, expensive -- primary data sets. Secondary data from Senegal suggest that the growth rates observed for crop yields and aggregate production in the late 1980s are based primarily on better rainfall. Use of purchased inputs has fallen, as has output per worker in agriculture.

Third, with respect to shifting consumption patterns, there is a clear shift away from what can be produced locally at competitive costs toward different commodities -- i.e. rice and wheat -- that can be imported cheaply. This implies more attention to policies for tradeable cereals -- rice, wheat and maize -- that may not have mattered very much when they constituted only 1 to 2 percent of cereals consumption, but which have greater fiscal and economic impacts when they are more than 30 percent of consumption, as they currently are in two Sahelian countries and soon will be in others.

Fourth, with respect to the prospects for traditional exports -- i.e. groundnuts, cotton and cattle -- it seems more crucial than ever to assess what is happening to Sahelian comparative advantage in exporting these commodities and why.

After review of the trends, Delgado turned to the question of what is driving comparative advantage for the traditional Sahelian exports. To address this question, the author presented his findings with respect to the evolution of the components in domestic resource cost calculations in a partial equilibrium context. This was to determine how, in isolation, these components might have affected comparative advantage over time for specific Sahelian commodities. His examples were cotton in Mali, groundnuts in Senegal, and live cattle in Burkina Faso.

In terms of the competitiveness -- i.e. the ability to make money at current prices and costs -- of Malian cotton during the 1970s, rising world cotton prices (10.6 percent per year) and a depreciating nominal exchange rate (- 2.3 percent per year) led to a 3.3 percent annual growth in Malian surplus of the gross value of cotton sales in domestic currency over the cost of procuring cotton from farmers (which was growing at an annual rate of 9.6 percent). However, this surplus was significantly offset by sharply rising transport and imported input costs. The impact of changes in transport and input costs by themselves, given their share in CIF production costs and the depreciating nominal exchange rate, was probably to decrease financial profitability of the sub-sector by 7 to 8 percent annually. Combined with the net positive effects of the other factors, the end result was probably a net overall decline in financial profitability of about 4 percent per year during the 1970s. Since some of this was absorbed in increased input costs to

farmers, the net decline in the government's profit from cotton was even less, and was manageable given the large profit margin early in the decade.

From the Malian farmer's viewpoint, cotton production was also acceptable. While domestic producer prices were increasing at the same rate as the consumer price index, productivity was increasing at 4.7 percent annually and government subsidies were helping to contain the rise in the costs of purchased inputs.

In the 1980s, however, events were disastrous for the financial profitability of the sub-sector. Falling world cotton prices (- 1.4 percent), appreciating nominal exchange rates (2.2 percent), and rising domestic procurement prices for cotton led to an 8.6 percent annual decrease in the gross surplus of the cotton sub-sector (in CFA francs). This could not be offset by declining world input and transport costs in U.S. dollar terms evaluated in CFA francs at an appreciating exchange rate, even if the benefits of the declining costs had been fully passed on to the sub-sector.

From the farmer's viewpoint, rising producer prices in the 1980s (5 percent annually) and productivity (2.2 percent) barely offset rises in the consumer price index (7.4 percent). Furthermore, input subsidies were now being reduced in Mali in an effort to restore profitability to the sub-sector, which meant that farm-level financial profitability was in fact decreasing relative to the consumer price index.

In terms of Malian comparative advantage -- i.e. the potential for profitability if feasible world reference prices and costs prevailed -- in cotton, the picture is similar but the relative importance of the underlying components is different. During the 1970s, the favorable impact on comparative advantage of rising world prices (10 percent per year), increasing farm productivity (5 percent) and the depreciating real exchange rate (1 percent) appears to have been more than offset by the unfavorable impact on comparative advantage of increases in input and transport costs (10 percent) and the rising opportunity cost of farm resources (10 percent).

During the 1980s, on the other hand, the favorable impact on comparative advantage of increasing productivity (2 percent) and lower world input and transport costs (2 percent) were swamped, according to Delgado, by the unfavorable impact on comparative advantage of declining world cotton prices (2 percent), an appreciating real exchange rate (4 percent) and the rising opportunity cost of farm resources (7 percent). These results suggest that Malian comparative advantage in cotton was declining slightly in the 1970s (4 percent annually) whereas it was declining at a faster annual rate (9 percent) in the 1980s.

What is perhaps more interesting is the finding that the rising opportunity cost of farm resources -- i.e. labor, land, etc. -- was equally as responsible as rising world input and transport costs in decreasing comparative advantage for cotton in Mali in the 1970s. In the 1980s, however, appreciation of the real exchange rate had twice the direct negative effect on the domestic resource cost calculation as declining world cotton prices. More importantly, the opportunity costs of farm resources had more than three times the negative impact of declining world prices.

With respect to the competitiveness of groundnuts in Senegal in the 1970s, Delgado found that the net effect of higher world prices for groundnut oil (12.2 percent per year) was more than offset in CFA franc terms by growth in domestic procurement prices (10.5 percent) and depreciation in the nominal exchange rate (2.3 percent). When the estimated unfavorable impact of higher transport and input costs in nominal CFA francs is added (8 percent), Delgado concluded that the financial profitability of the Senegalese groundnut sub-sector fell considerably during the 1970s.

During the 1980s, the net effect on sub-sector financial profitability of falling world prices (3.3 percent per year), rising domestic procurement prices (6.3 percent) and an appreciating nominal exchange rate (2.2 percent) was a slight annual increase in surplus (1.8 percent). Any benefit passed on to the sub-sector from decreased world input and transport costs in nominal CFA franc terms (- 5 percent per year) would have added to this surplus. Thus there appears to have been more scope for financial profitability in Senegalese groundnuts at the end of the 1980s than was the case at the beginning.

From the farmer's viewpoint, in the 1970s the net positive effect on financial returns of an 11 percent annual combined growth in domestic procurement prices and productivity was more than offset by an 11.6 percent annual growth in the consumer price index. This unfavorable effect was exacerbated to the extent that any part of the rise in true input costs was passed on to farmers. During the 1980s, however, the combined favorable effect of procurement price and productivity increases (12.5 percent per year) exceeded the unfavorable impact of a rising consumer price index (7.1 percent). Although the value of world prices of inputs in nominal CFA francs was decreasing (5 percent), this was not passed on to producers, who in fact were facing a lowering of the considerable subsidies that they had previously enjoyed. Furthermore, quantitative restrictions on the availability of inputs in this period limited the ability of producers to benefit from the changing conditions.

Delgado found that the comparative advantage of Senegalese groundnuts may have decreased in the 1970s by 5 percent annually and that they continued to decline in the 1980s but at a slower rate (1 percent). In the 1970s, the favorable impact of higher world groundnut oil prices was exactly offset by the higher opportunity cost of farm resources. Then, the unfavorable impact of higher input and transport costs swamped the favorable but small impact of productivity gains and a depreciating real exchange rate. In the 1980s, the unfavorable impact of falling world prices was just offset by the favorable impact of falling transport and input costs. However, the major favorable impact of rising productivity was more than offset by major increases in the opportunity cost of farm resources.

In analyzing the regional trade in live cattle between Burkina Faso and Cote d'Ivoire, Delgado concluded that both the financial profitability and the comparative advantage of Burkinabe cattle exports decline significantly over the past twenty years. During the 1970s, there was a differential in growth of beef prices in Abidjan and Ouagadougou (1.1 percent per year) which was favorable to cattle producers in Burkina Faso. However, rising transport costs may have negated any advantage in financial profitability. During the 1980s, beef prices in Abidjan

increased by 2 percent annually whereas those in Ouagadougou fell at a 1 percent annual rate. However, any improvement in financial profitability that this growing differential might have offered was swamped by the 8.7 percent annual rise in railway freight costs. Moreover, the 7 percent annual rise in the consumer price index in the 1970s and the 4 percent annual rise in the 1980s shows that real beef prices per kilogram in Burkina Faso rose by 3 percent annual in the 1970s but fell by 5 percent per year in the 1980s.

In terms of comparative advantage, the favorable effect of growth in Abidjan beef prices in the 1970s was countered by growth in the opportunity cost of Burkina Faso farm resources, escalating railroad freight rates and an appreciating real exchange rate between Burkina Faso and Cote d'Ivoire. The lack of growth in current prices in the 1980s -- i.e. the decline in real prices due to dumping by extra-African beef exporters -- therefore failed to compensate for major increases in freight costs, the rising opportunity cost of farm resources and an appreciating real exchange rate.

Drawing on these examples, Delgado concluded that over the 1970s, the comparative advantage of Mali in cotton and Senegal in groundnuts decreased modestly, whereas that of Burkina Faso in cattle exports decreased strongly. During the 1980, however, the comparative advantage of Mali in cotton appears to have decreased twice as rapidly as in the 1970s whereas the comparative advantage of Senegal in groundnuts remained essentially unchanged and that of Burkina Faso in cattle exports continued to decline sharply.

Delgado's major conclusion in analyzing the components of the comparative advantage for commodities in the Sahel is that any choices between and prioritization of commodities in the context of revitalizing Sahelian agriculture need to entertain considerations that go beyond world price projections for specific commodities translated into CFA francs at nominal exchange rates. The key variable to examine in Delgado's judgement is the evolution of the opportunity cost of farm resources used to produce a unit of tradeable agricultural output. Under Sahelian conditions, this will be a function primarily of two factors: the productivity of farm labor in producing tradeables (the higher the better) and the cost of labor in terms of tradeables (the lower the better).

Delgado also argued that, while world prices for export commodities and inputs mattered to the evolution of comparative advantage in the Sahel during the last two decades, factors and events which shaped Sahelian agricultural productivity, transport cost and, most importantly, the opportunity cost of labor were at least as important to comparative advantage.

After a brief review of world and regional market prospects for traditional Sahelian exports, Delgado came to the following conclusions. With respect to cotton, there appears to be some disagreement as to prospects for the cotton prices by 1995. One informed observer estimates that the real 1995 price for cotton in the world market is likely to be even lower than the 25 to 30 percent decline against the average real price from 1976 to 1988 forecast by the World Bank. On the other hand, the cotton parastatals of major producers in the Sahel in 1990 are operating at a profit for the first time in five years under a currently high world price. Finally, he stated

that the quality of CFA franc zone cotton has been an issue and that continued work in this area will be needed.

Delgado reported a strong consensus that world demand for vegetable oils will be strong for the foreseeable future. However, the implications of this for Sahelian groundnut oil appear to depend on three things. First, there is the question of the ability of Sahelian producers to differentiate their product on a quality basis as a preferred monounsaturated oil. Second, the ability of the Asian palm oil producers to expand production (which appears likely). And, third, the health of the livestock market seems especially critical, as world demand for oilseed cake is soaring and palm oil growth does not increase cake supply, as is the case with increased soybean and groundnut production.

With respect to livestock potential, Delgado sees an extraordinary market potential in Cote d'Ivoire with an expansion in meat consumption as income growth resumes. The fact that Ghana and Nigeria are reemerging on solid economic growth track will only serve to strengthen demand prospects.

On the supply side, in the case of both dairy and other types of livestock development, the principal constraint has always been an adequate supply of low cost high energy feeds. Delgado concluded, however, that new cereals technologies for sorghum and maize offer hope for breaking this constraint but only if cereal prices are allowed to fall. Increased livestock exports from the Sahel -- especially small ruminants, poultry and eggs -- would also probably increase demand for groundnut by-products significantly.

In this regard, groundnut hay and cake may represent up to 50 percent of the CIF value of groundnut production. Since these by-products are bulky and thus costly to transport, they enjoy a high degree of natural protection. This implies, according to Delgado, that a resurgence of both livestock exports and domestic dairy production would increase the comparative advantage of Sahelian groundnut production, especially in countries where the latter is a less important share of total production than is the case in Senegal and Gambia.

Much of Delgado's preceding analysis showed that the opportunity cost of farm resources in terms of foreign exchange is central to the issue of the Sahel recovering its ability to export and thus to grow in economic terms. From this Delgado concluded that, as long as the comparative advantage of the Sahel remains in agriculture and it requires foreign exchange, there is no way to remain competitive unless something is done about the problem of the opportunity cost of farm resources in terms of tradeables increasing faster than farm productivity in terms of tradeables. He stated that it is the latter that has been the economic villain of recent years.

It is clear, according to the author, that a devaluation of the real exchange rate is required for all Sahelian agricultural exporters. However, this cannot by itself solve the problems of revitalizing agriculture. Massive investments must be made in improving productivity of those exports likely to be able to compete.

But even this is not enough, however, in that the Sahel has a curious economic characteristic in international terms relative to other areas. According to Delgado, while the region is necessarily dependent on agricultural exports, the principal factor in production of these exports is smallholder labor. The domestic cost of labor in turn is highly correlated with a wage-good that is not traded internationally -- i.e. Sahelian wage rates tend to be correlated with the average product of labor in the production of millet and white sorghum. In addition, the price for maize is closely correlated with the prices for millet and white sorghum.

The implication of this is that unpredictable supply outcomes for the traditional foodgrains are central to determining the CFA franc cost of labor. Since Sahelian countries are pricetakers internationally for their exports and imports, lack of control over the domestic cost of labor means that it would be very difficult for governments to manage their real exchange rates, even if they had full control over the conventional instruments of fiscal and monetary policy, which they do not given their commitments to the conditions of the CFA franc zone monetary union.

On the other hand, increases in productivity for traditional foodgrains may provide governments with even greater scope for restoring competitiveness than improvements in the yields of the cash crops themselves. This is so because, with the price inelasticity of demand for traditional foodgrains and the wide band between their export and import parity prices, large increases in productivity for foodgrains would probably be translated rather quickly into falling prices for these grains and reduced acreages planted, without reductions in total supply. This would, in effect, free resources -- i.e. labor and land -- for producing other goods for which export markets exist.

For both human food and feed, then, cheaper coarse grains have a central role to play in strategies for growth and food security. Delgado saw it as essential, therefore, to continue efforts to increase the productivity of labor in the rainfed cereals sub-sector. This conclusion is reinforced, rather than hindered, by the existence of viable export markets for non-cereals because of the linkages through the cost of labor.

In sum, then, Delgado argued that a relatively small set of commodity priorities is required for revitalizing the growth process in Sahelian agriculture. This does not deny the importance of capitalizing on specific opportunities for non-traditional exports, but rather cautions against expecting that one can ignore the traditional exports and still arrive at an acceptable growth strategy.

In the Delgado strategy, the centerpiece should be a concentration on policies that seek to lower the costs of production of tradeables relative to the returns from exportables. The strategy requires, in addition to a sound macroeconomic environment, investments that seek to decrease the unit costs of production of the principal cereals cum wage-goods, principally millet, sorghum and maize. The primary intervention in this regard would be agricultural research but adequate input supply and extension systems are also needed.

Reducing real labor costs may also require reducing unit costs in the distribution of cereals to

major points of consumption. In the Sahelian context, where transport costs to major markets and local costs of production may be roughly equal as components in consumer prices, reductions in unit transport costs may be just as critical as reductions in unit costs of production.

C. Is the Adjustment of Exchange Rates a Means to Encourage Local Production?

The principal contribution on this topic was presented by Dr. Marc Raffinot of the Université Paris IX Dauphine. The object of the presentation was to analyze -- theoretically and empirically -- the impacts of currency devaluation on different components of African agricultural systems.

From theory, the author made several key points:

1. In analyzing the impacts of a devaluation in the developing world, one cannot always assume that the country in question fits the "small country" scenario -- i.e. it is a price taker because changes in volume of its exports have no effects on world market prices.
2. A devaluation does not necessarily result in an immediate increase in export volume in response to increased importer demand. In the case of agricultural commodities, unless a country has stocks on hand, one must wait at least until the next harvest after the implications of the devaluation on profitability have been fully integrated in producers' allocative decisions.
3. A devaluation usually has effects in the medium term after price adjustment between tradeable and non-tradeable goods has occurred. Only then, if producers act "rationally", will the relative price changes engender a supply response in terms of quantities produced -- or, at least, areas cultivated. Moreover, the direction of the supply response should favor export commodities over those produced for the domestic market. It is this effect, plus the decline in demand for imported commodities in the face of higher prices, which works to reestablish an equilibrium in the balance of payments.
4. The response of producers to a devaluation, therefore, plays a crucial role in any analysis. However, one is faced with two different options in devaluing. If one seeks to maximize total receipts, the producer prices for export commodities must be set as close to the world market price as possible. On the other hand, if one wishes to maximize government revenues from a devaluation through a marketing board arrangement, then the most "rational" producer price from the government's perspective will be somewhat lower and the precise level will depend on the supply elasticity for the commodity.

5. Although devaluation affects export commodities primarily, it can also affect food crops if local commodities and imported commodities are substitute products and if producers respond "rationally" to the new incentives. However, one should realize that the effects of devaluation on food security can be severe for certain populations, particularly urban consumers who spend large portions of their income of food.
6. The incentives provided by devaluation may not be operationalized in terms of increased competitiveness in some smallholder agricultural situations because the concept of production costs is not understood in precise terms. Producer income appears in these cases as a residual, composed partially from direct autoconsumption. While entrance into cash economies means that more smallholder producers make allocative decisions based on their estimates of the opportunity costs for their available resources, particularly labor, the concept of costs of production is still not fully understood everywhere.

The critical linkage, then, is that between devaluation and producer prices for agricultural commodities. And, in turn, the effects of these price changes on producer supply response. The underlying assumption is that changes in relative prices are the principal factor inducing a supply response. However, there is a considerable body of econometric analysis that shows that short-term supply elasticities with respect to price for exportable agricultural commodities are positive but very weak; although long-term supply elasticities are higher. Moreover, in the case of individual commodities, it is not always evident that the supply response is not coming at the expense of other crops.

In sum, the author concluded that one could expect the impacts of devaluation to be highly variable in different countries. The intensity and distribution over time of supply responses will differ with annual and perennial crops. And, in the latter case, one must distinguish between short-term supply responses originating from better management of existing plantations and longer-term ones resulting from new plantings.

Raffinot then proceeded to review the results of two studies on the impacts of devaluations in African countries with respect to the objectives of increasing supplies of agricultural export commodities and, to a lesser extent, on increasing supplies of import substitution commodities. He prefaced his review by saying that analyses of this type are difficult methodologically because it is very hard to isolate the effects of devaluation per se in situations where a number of factors are operating simultaneously. This, he explained, was why one found that studies on the same country situation often came to very different conclusions.

The author's comments were confined to two studies by Jacquemot and Assidon (1988) and by Diakovvas and Kirkpatrick (1990). He presented the following key findings:

1. The Jacquemot and Assidon study, which analyzed the relationship between growth in exports and depreciation in the exchange rate vis-a-vis the DTS for fifteen African countries, found that only four of the fifteen showed positive and statistically significant supply responses when analyses used quarterly, seasonally-adjusted data and five showed significant but irregular responses. When a quarterly time series of non-seasonally adjusted data was used, eight countries showed positive and significant supply responses and two showed significant but irregular response patterns.
2. The Diakovvas and Kirkpatrick study, which analyzed the relationship between growth in agricultural exports and declining real exchange rates in 28 countries over the period from 1974 to 1987, found that a positive relationship existed in only nineteen (68 percent) of the cases and that the finding was significant at the 90 percent level in only twelve cases. This finding is weakened further, according to the author, if one eliminates the CFA franc zone countries from consideration.

It appears that, in the period 1975-1987, very few African countries increased their volumes of agricultural exports at rates greater than five percent per year. Only Congo, Gabon, Malawi and Swaziland accomplished this growth and, in the latter two countries, agricultural exports are very marginal. In all of these countries, the real exchange rates declined.

In the six African countries having growth in agricultural exports at annual rates less than five percent, one found two countries with rising real exchange rates. Moreover, among ten countries where growth in agricultural exports declined by up to five percent annually, six had declining real exchange rates. And, finally, in the seven cases where growth in agricultural exports declined by more than five percent annually, four had declining real exchange rates.

Diakovvas and Kirkpatrick, therefore, concluded that the results obtained in their study did not support the hypothesis that real exchange rate changes play a significant role in increasing supply responses in export crops in sub-Saharan Africa.

3. Both of these studies, according to Raffinot, may overestimate the actual effects of devaluation on export growth in that they are based on official values for exports. This may distort the findings in two ways. First, the value of exports in parallel market channels may be lower than in official ones. And, second, some of the "growth" in exports after devaluation may simply be reflective of greater flows of export commodities through official channels.

In reflecting on the lower than expected impacts of devaluations on growth in agricultural exports, Raffinot suggested the following explanatory factors:

1. The impacts of devaluation were masked by the fact that the devaluations took place during a period of declining prices for agricultural commodities in world markets.
2. The "small country" assumption does not hold in all cases and, therefore, increases in exports of certain commodities do affect declines in world price levels and provoke retaliation by competitors.
3. Devaluation only opens the possibility of increases in producer prices. In actuality, producers often do not have either the necessary information or the negotiating power to actually capture the full benefits of a devaluation. In these cases, large shares of the benefits of devaluation may, in fact, be captured by marketing boards and other agencies acting on behalf of governments, not producers, or by private market intermediaries.
4. The benefits of devaluation can be masked if a large percentage of the difference between the world price and the producer price for a commodity is reflective of transport and processing costs and if this percentage rises with devaluation due to higher costs for essential imports.
5. The gains from a devaluation can be negated by countervailing government taxation and/or other policies -- e.g. eliminating subsidies on agricultural inputs and/or credit.
6. Producers may find that they either do not have access new technologies needed to increase production or do not have the means to adopt them, even where price incentives are favorable. In addition, institutional support -- i.e. research and extension agencies, agro-industrial processing networks -- may be disorganized and ineffective in fostering growth.
7. The direct incentives from devaluation in terms of increased producer prices may be negated by the rising costs of consumer goods demanded by rural families.

With respect to the specific situation of the CFA franc zone countries, Raffinot observed that one can see the symptoms of an overvalued exchange rate in all of these countries and, particularly, with regard to their agricultural sectors. He stated that agricultural export commodities from CFA franc zone countries are in competition with those of non-franc zone African countries, where devaluations have already occurred. The reductions in the relative costs of commodities from non-franc zone African countries have had very significant effects on trade flows. In this regard, the reversal of the pattern of exchanges between Nigeria and its franc zone neighbors is most spectacular. In addition, since a large percentage of intra-African trade passes through unofficial channels, when exchange rate parities become highly distorted, there are likely to be budgetary consequences -- i.e. losses -- for governments who try to maintain both overvalued exchange rates and programs that guarantee producer prices for export commodities. For

countries in West Africa with non-convertible currencies, the attractiveness of capitalizing on these distortions is a dual one. First, it is the windfall profits to be made on the distortions per se. Second, there is the added benefit of obtaining these payments in a convertible currency.

Raffinot stated that the traditional argument that currency parities can be maintained by means other than devaluation -- i.e. export subsidies, higher tariffs on imports, etc. -- while correct on paper, has practical weaknesses. The major ones being that, since such systems create opportunities for economic rents, they engender higher levels of corruption and also lead to lower government receipts in official commercial channels when parallel markets develop.

He concluded that the only valid element in the argument was that not adopting devaluation has forced franc zone governments to seek means of reducing costs in the existing export crop "filieres". But, even here, the author contended that such changes would have been easier to accomplish in the context of devaluation than outside it. And, in any case, most of the cost reductions were in fact forced on the governments in question by the donors and with the intervention of technical assistance personnel.

Raffinot also observed that the situation of the Sahelian countries, with their open economies, has been particularly affected the trade policies of industrialized countries -- particularly those in the European Community -- in that Sahelian commodities -- i.e. meat, milk and cereals -- have been forced to compete against extra-African commodities which were "dumped" in West African markets -- coastal and Sahelian.

It appeared to the author that the expected positive effects from devaluation on agricultural supply response were not always clearly evident in Africa. But, he observed, that is not to say that devaluations do not have beneficial effects on other segments of the national economy -- notably on public finances. The elements which determine whether or not agricultural supply responses improve do not always lie within the price and exchange rate systems, but any positive changes in these systems will always contribute to improving the prospects for agricultural growth.

Devaluation, the author stated, is never an optimal policy in that it is always a recognition of an economy's failure to fully exploit national factors of production vis-a-vis world markets under the existing exchange rate. Such action is sometimes necessary, but it is never desirable, particularly if success is not guaranteed. However, in the franc zone, the maintenance of present parities imposes a heavy constraint on agricultural production and translates into all sorts of parallel market phenomena. Devaluation, therefore, appears to be one of the only weapons left to governments to avoid the complete undermining of existing export crop "filieres".

D. Do Anti-Risk Strategies Limit Producers' Productivity?

The basis for discussion of this topic was a presentation by Dr. Jean-Marc Boussard of INRA/SER/Ivry. The author started his presentation with the contention that elementary economic theory supposes a "certain future" and that, of all the hypotheses made by economists, this one is least justified. The behavior of economic agents when the future is not sure is entirely different than it is under the assumed condition. For this reason, economic theories which depend which the assumption of a certain future are likely to prove inadequate when confronted by the realities of economic life. For these reasons, the author believed that consideration of the effects of risk and uncertainty were relevant to economic analyses.

His essential conclusion was that, in all cases, risk leads farmers to reduce their specialization in production of any one crop and to diversify their production over several different enterprises. Boussard contended that most persons considered the reduction of technical risks in agriculture, particularly those related to climate, to be very important in the Sahel. However, in his opinion, these risks are far from the only risks faced by farmers and may not even be the most important.

For this reason, the author presented his evaluation of the factors affecting agricultural supply response. His alternative theory of supply response revolved around four major ideas:

1. Changes in production of a crop are not determined by its profitability vis-a-vis alternative crops but by the structure of fixed factors commanded by the farmer.
2. The only way to modify the structure of fixed factors is by the slow accumulation of capital, which itself is dependent upon savings and access to credit. For this reason, changes in agricultural supply response are slow to evolve and do not always follow the directions indicated by variations in prices, particularly with respect to the most recent prices.
3. In open markets, changes in supply are constrained by fluctuations and instability caused, not only by weather, but by the structure of the markets themselves.
4. The result for farmers is great difficulty in forming expectations of the future in the face of the risks. As a result, agricultural supply is diminished and the economy is poorer for it.

Boussard made the point that a factor is fixed only in that its marginal product is less than its purchase price but higher than its salvage value. As a result, changes in either prices or availability of other factors have the effect of modifying the fixed or variable character of a factor of production. When a fixed factor becomes variable, then one has the structural change which engenders changes in volume and nature of agricultural supply.

He pointed out that savings and capital accumulation in agriculture are dependent upon the size of previous crop sales and the prices received when the sales were made. This, in turn, is why

growth in agricultural production and changes in agricultural price levels are related. This dependence of agricultural production on agricultural prices, however, is not the normal, short term opportunity cost relationship postulated by many economists, but a longer term one in which favorable and unfavorable prices affect modifications in the structure of fixed assets over time. And, these changes in turn are the driving force behind changes in agricultural supply response.

Boussard observed, however, that this relationship may be stronger in developed country agriculture than in the Sahel because it is not rare for farmers in African countries to use any profits from their agricultural enterprises to invest in non-agricultural enterprises. As a consequence, the directions of agricultural supply response to changing prices are incredibly difficult to predict and vary greatly over time.

In many markets, price fluctuations observed are structural in nature and are not based primarily on fluctuations in weather. This is not to say that weather fluctuations are not very important to Sahelian farmers, but only these fluctuations compound and accentuate those already inherent in open markets. He stated that more open markets in the international sense should be less subject to price fluctuations originating with local weather changes because supply and price levels vary much less on world markets than in local ones. However, economic decisions by farmers are usually based on their appraisals of expected prices and local conditions, even though those conditions may be judged of no importance when viewed from a world perspective. This is why "perverse" responses are sometimes observed from price changes.

The author then observed that, based on these findings, it is vain to want to regulate agricultural supply response solely through price manipulations. While farmers are doubtless aware of and respond to such manipulations, their reactions are slow and not always in the expected direction. The same findings suggest, however, that there are other determinants of supply response to work with, notably in reducing the variability in farmer revenues from a given crop. Boussard suggested that the risk and uncertainty imposed by such factors have been shown in economic modeling exercises to reduce the gross value of production by 30 to 50 percent. It is not out of the question, therefore, to say that risk and uncertainty could lead to losses in productivity of up to 50 percent in African situations and that a major part of this loss is due to variability in agricultural prices, which are at least partially under government control.

Boussard cautioned that efforts to stabilize prices, however, must be studied and planned carefully because stabilization is not a panacea which always permits agricultural output to expand in response to the needs of a population. He pointed out three limitations on such policies. First, the failure by farmers to reinvest the profits from greater stability in agriculture. Second, the possibility of countervailing actions by governments to reduce the flow of benefits to farmers. And, third, technical demand/supply conditions which lead farmers to overproduce in the face of government stability programs.

E. Do Current International Trade Conditions Undermine the Future of Sahelian Production?

The principal contribution on this topic was a paper presented by Drs. Johny Egg of INRA/ENSAM and John Igue of the Universite du Benin. The paper was the latest in a series of contributions by the two authors in the context of the continuing debate on the benefits and costs of regional protection for cereals in West Africa -- i.e. the creation of "espaces regionaux" -- which was initiated at the CILSS/Club du Sahel seminar in Mindelo in 1986.

After reviewing the state of the debate since 1986 and pointing out that the participants have arrived at an impasse, the authors presented the major findings of their research since 1987. These were that:

1. Interregional exchanges of goods are important in West Africa even if the major portion of them are not recorded by customs authorities;
2. Regional trade in imported cereals -- i.e. rice and wheat flour -- is more important than trade in local cereals due to the strategies for reexportation of these cereals adopted by many countries. In addition, trade in imported foodstuffs -- notably cereals and meat -- are competing with local commodities both at the production level and in local trade;
3. The disparities in economic policies between West African states -- notably monetary and trade protection policies -- determine in large part the direction and volume of interregional trade flows; and
4. Given the interregional commercial networks and the organization of trade in border areas, a regional commercial market already exists in fact.

Egg and Igue state that their results have been the subject of different interpretations. For some, the evidence of numerous cases of reexportation of imported goods within the region -- which defeat national trade policies, contribute to the growth in the volume of imported cereals, and substitute for a local cereals trade -- reinforces the need for regional agricultural protection. For others, the demonstrated capacity of traders to play on and benefit from the disparities in the commercial policies between individual states -- often in concert with government officials -- is proof that efforts at regional protection will fail or will only introduce additional distortions into regional markets. The de facto regional integration of trade in West Africa appears to decision-makers to create an opportunity for further market liberalization through the removal of tariff and non-tariff barriers between states to stimulate exchanges and to make "official" current trade flows. For some, the liberalization of trade in West Africa is seen as the first step in opening international markets. For others, it is the basis for constituting a regional and protected market.

The authors noted that these different interpretations and emphases have not blocked the development of a general consensus on the importance to be accorded to interregional trade.

They went on to say that to develop such trade relationships one must recognize existing complementarities between Sahelian and coastal economies and reflect on how these can be further developed in the future. One must attempt to find what are the comparative advantages of each country within the region and how they might be developed to raise production and improve food security.

This new approach, adopted in Lome in 1989, has, in the opinion of the authors, broadened the perspectives of the debate on external trade for the Sahelian countries and modified the manner in which one approaches the problem of the competitiveness of Sahelian agriculture. The idea now is to research regional comparative advantages in West Africa before searching for more hypothetical advantages in world markets. When one proceeds in this manner, Egg and Igue contended that it was probable that certain production enterprises, which have shown no absolute comparative advantage with reference to world markets, would show advantages in a regional context.

They state that, if one adds to this that the protectionists and the liberals are in agreement on the necessity of restructuring cereal "filieres" to improve their competitiveness and adopt policies to stabilize prices and revenues, then one could think that agreement on a policy of protection will be easier to reach. In this sense, protection becomes a means of achieving liberalized regional markets. Temporary and gradual measures of protection could accompany the disengagement of the states and also combat strategies of "dumping".

This approach, the authors contended, enlarges the scope for economic research because:

1. Studies of individual commodity networks must now be extended into neighboring countries, something which has not yet been done, except in the case of studies on trade in kola nuts and livestock products;
2. Comparative studies must be started for Sahelian countries in the CFA franc zone and coastal countries outside it;
3. It implies a coming together of research approaches. In this, the study of border and interregional exchanges has shown that they entail factors of different orders of magnitude: comparative costs of production play a large role but other factors like the attractiveness of obtaining a convertible currency for traders in countries with non-convertible currencies and the availability of desirable counter-trade goods also play important parts in regional markets.

Thus, the authors concluded that there are a number of factors to study in determining the competitiveness of a particular commodity in specific regional markets. In the situation where research efforts can be integrated, this approach is clearly more realistic than one that looks only at the competitiveness of a commodity vis-a-vis the world market. The authors advocated this regional approach because: first, it takes into consideration realities ignored until now in national policy-making, even though these realities are central to the behavior of market intermediaries;

and, second, it puts the debate on protection and comparative advantage on a more realistic basis and should result in more tangible proposals.

The authors went on to point out that the concept and reality of the "nation-state" in West Africa does not always provide the most appropriate structure for dealing with economic development problems. For a long time, the newly independent nation-states in West Africa tried to put in place development programs, notably in agriculture, which could generate the means to cover their recurrent operations, finance development activities and start a process of industrialization. Unfortunately, with few exceptions, these efforts reflected false hopes and served to reveal for most countries only their economic weaknesses.

These failures have over time have promoted the organization of informal trade networks between populations which explicitly operate outside the constraints of government policies and supervision. The intensification of these informal exchanges across state borders has, in some sense, compensated for the deficiencies of government efforts and eased the effects of economic crisis. They have also contributed to reinforcing de facto regional integration in West Africa. The dynamism displayed by these informal trade networks stands in dramatic contrast to the listlessness of many of the national and regional organizations created by West African states.

The authors noted that the effects of an absence of effective regional cooperation in agricultural development are clearly felt in West Africa today. National programs for development of export crops are often in competition with one another and, in the case of programs for food security, each country has tended to make investments which are duplicative with its neighbors and uncoordinated regionally. Food policies defined in a national context have not allow populations to benefit from agro-ecological complementarities in West Africa.

In sum, then, Egg and Igue concluded from their work on regional exchange networks that agricultural trade in West Africa is not structured around states and, even less, around the existing official regional trade organizations they have created. It is structured on the basis of mutual advantage between populations and sub-regions, irrespective of national borders.

The authors concluded by saying that the regional market in West Africa is well organized and managed by African traders who market both local and imported commodities. Commercial networks extend from the Sahelian countries to the coast, with important exchange sites in border areas. These regional networks are the reality for agriculture in West Africa and, until now, states in the region in formulating and executing their policies have been operating outside the realities of this regional situation. And, in this respect, Egg and Igue found it difficult to envision an integration in development processes without true regional integration based on interregional complementarities and the potential of different agro-ecological zones.

At the same time, they noted that West Africa is not by any means a single unified regional market. It is more a series of sub-markets organized as trade circuits. There are, for example, the western sub-market area comprising Senegal, Gambia, Guinea Bissau, Guinea, western Mali and Mauritania; the sub-market comprising Nigeria and its immediate neighbors; and the sub-

market comprising the coastal countries of the Gulf of Guinea, southern Mali and Burkina Faso.

F. Does the Widening of Markets Permit the Balancing of Production Variances?

The author -- Dr. Josue Dione of PRISAS/Institut du Sahel in Bamako -- responded to the question of whether or not widening regional markets in West Africa would stabilize the market conditions faced by Sahelians by resort to a review of recent literature on the subject. In doing so, Dione hoped to extract key findings bearing on the question.

In this regard, the author observed that the call for a protected regional cereals market, first heard in 1986 at the Mindelo seminar, expressed the idea that regionalization of the market would have the advantage of reducing instability in cereals supply between sub-regions. This belief in the stabilizing effect of intraregional trade is expressed in several recent studies (Badiane, 1988; Badiane, 1989).

The primary source of enthusiasm for such a policy of market integration was based on the supposition of an unexploited potential for growth in intraregional trade flows. And, in fact, use of a series of quantitative indicators leads one to the conclusion that actual trade flows within West Africa are considerably less than the potential for the region. And, thus, countries could benefit from exploiting latent comparative advantages in an open intraregional market and also stabilize intraregional cereal supply out of variances in national production.

In studying the situation in more depth, however, several studies (Egg and Igue, 1986; Egg, 1989; Igue, 1989; Lambert, 1989; Lambert and Egg, 1989; Some, 1989) concluded that an important intraregional trade in cereals already existed despite the efforts of governments in the region to circumscribe their cereals trade within their own borders. Moreover, this intraregional trade was based upon ethnic group solidarity in trade across borders, the complementarities of agro-ecological zones, and, more importantly, the abilities of traders to exploit disparities in national approaches to pricing and trade policies to their advantage (Egg and Igue, 1986; Igue, 1989; Lambert and Egg, 1989).

Given the frequent changes in national economic policies and the fluctuations in world prices for cereals, some researchers concluded that the actual dynamic in the regional market contributed to maintaining -- and even increasing -- market instability in West Africa by putting countries at a disadvantage vis-a-vis the world market and promoting re-exportation operations. The disparities in national policies, therefore, not only promoted commercial opportunities in the informal markets but created an unfavorable climate for the development of regional agricultural production. (Badiane, 1989) With the growing volumes in trade, it is most important than ever that national agricultural and trade policies be harmonized across the region so as to stabilize and reorient intraregional commerce in a way more favorable for regional development. (Egg, 1989)

The author observed that another group of researchers tended to be less optimistic about the prospects for growth in Sahelian cereals production simply in response to a further integration of regional markets. Shapiro and Berg (1988), for example, put forth several arguments

supporting the position that the competitiveness of cereals production in the Sahel was low primarily because farmers lacked technologies capable of increasing productivities dramatically and consequently costs of production were too high. Martin (1988) concluded that farm supply response(s) to price incentives would be seriously constrained by a variety of factors -- i.e. farmer risk management strategies in the face of climatic factors; the slow rate in development of improved agricultural technologies; lack of capital and adequate infrastructure; the absence of private research organizations. Finally, other researchers asserted that the demand for Sahelian food commodities depended on other factors than the relative prices for cereals per se -- i.e. urbanization, the evolution in the structure of employment, increases in the opportunity costs of work by women in processing local cereals. (Delgado, 1987; Rogers and Lowdermilk, 1988; Reardon, 1989; Reardon, Thiombiano and Delgado, 1989).

Dione went on to say that recent work by Gentil and Ledoux (1988) and Gentil (1989) had refuted many of the arguments presented on the prospects for increased productivity in Sahelian cereals production. The new findings purport to show, first, that cereals production can be increased in the Sahel by:

1. Distribution of short-cycle, drought-resistant varieties of millet and sorghum in zones with less than 600 millimeters of rainfall;
2. Use of fertilizer on sorghum in the zones having more than 600 millimeters of rainfall; and
3. Use of animal traction and fertilizers on maize in the most humid production zones.

Second, important increases in rice production can be obtained efficiently under the following conditions:

1. Reducing investment costs through greater private competition, provision of less technical assistance, and greater farmer participation in management of irrigated perimeters;
2. Application of rehabilitation techniques and less intensive systems of double cropping in existing perimeters;
3. Better exploitation of the potential for rainfed rice in appropriate zones like those in southern Mali.

Third, the effective complementarities between crops brings into doubt the alleged incompatibility between the objectives of simultaneous growth in food self-sufficiency and production of export crops. Fourth, a series of studies by ORSTOM indicate that African farmers are very sensitive to price signals when they have regular access to profitable markets and needed agricultural inputs. Fifth, the hypothesis of structural rigidity and irreversibility of trends in cereals

consumption might not hold in the case where techniques were improved and costs of processed local cereals were lowered for Sahelian consumers.

On the supply side, then, the author summed up by stating that agricultural production in the Sahelian countries appears to be far from leveling off at any immutable production frontier. One is, therefore, encouraged to think that important potential remains to be realized through exploiting latent comparative advantages to promote growth and stabilize regional food production. All information seems to indicate that selection of this regional option will necessitate a series of appropriate actions -- political, institutional and technological -- not only to assure free circulation of goods in the region, but also to stimulate and support regional growth without derailing the local efforts at improving food production and consumption.

The author went on to observe the instability in markets can result from fluctuations in either supply or demand and, most often, from simultaneous changes on both sides of the market equation. On the demand side, Staatz, Dione and Dembele (1989) showed that low salaries, purchasing power and irregular payment of workers in urban areas cause major disturbances in local cereals markets. In rural areas, a number of studies have demonstrated that farmers with net deficit food production situations use alternative sources of income -- i.e. revenues from cash crops, livestock raising, salaried off-farm employment, etc. -- to satisfy family food needs. (Reardon, Matlon and Delgado, 1988; Dione, 1989; Goetz, 1989; Stephen and Mehta, 1989; Staatz, D'Agostino and Sunberg, 1990) The stability of the family consumption in both urban and rural areas depends, therefore, on total family income. Any disruptions or changes in the sources of family income are transmitted rather quickly to cereals markets through changes in effective purchasing power.

Dione pointed out that, since farm families always have interests on both the supply and demand sides of the market equation, the distribution of benefits from market stabilization efforts will be different depending on whether the family is a net supplier or buyer of cereals. The same will be true for countries and different agro-ecological zones within a regional context, as shown by Badiane (1989) for the region and D'Agostino and Staatz (1989) for southern Mali.

In conclusion, the author extracted five major ideas from the existing literature which he believed merited further systematic evaluation.

First, the combination of the strong positive correlation between food consumption and food production and the lower variability in regional cereal supply as compared with national production levels indicates that regional integration in the supply of cereals could contribute to reducing, in certain measure, the instability in food markets in the Sahelian countries. The principal beneficiaries of such an operation would be urban and rural consumers in the net cereals importing countries and the producers in the cereals surplus countries. The net gain in reducing instability in cereals markets would be more important for those countries with the highest interannual variabilities in food production -- i.e. Gambia, Guinea-Bissau, Mauritania, Niger, Senegal and Chad. On the other hand, complete regional integration of markets would tend to introduce more instability into certain national markets, which are presently quite stable -- i.e.

Benin, Cote d'Ivoire and Guinea.

Second, the integration of national cereal supplies would not be sufficient to eliminate all instability in regional food markets. It is therefore important to keep open the possibility of extra-regional trade to absorb any remaining instability in the regional market and to avoid making disadvantageous compromises with the food security of Sahelian populations.

Third, important transnational exchanges of cereals between West African countries have been occurring for a long time despite national efforts to circumscribe markets. Rather than being a reflection of the regional differences in comparative advantage, these exchanges have been reflective of speculative exploitation of economic rents derived from disparities in national agricultural and trade policies. Harmonization of national economic policies on a regional basis, therefore, constitutes a necessary condition for any stabilization and reorientation of intraregional trade toward more efficient exploitation of the dynamics of food production in the Sahel and the rest of West Africa.

Fourth, careful attention needs to be given to examining specific situations that show evidence of major potential for growth in food production and trade by zone in West Africa. Full realization of this potential will come not only with careful adoption of production technologies tailored to different ecological zones and sub-zones but also by adoption of deliberate policies and investments in infrastructure, technologies and institutions for these zones, without derailing local programs.

Finally, the development of Sahelian agriculture is passing through a process of capital formation at the producer level. This process requires a global approach to rural development which transcends the confines of any single crop or commodity. It is necessary above all to identify and promote a group of key food and export crop and livestock enterprises in the context of a dynamic vision of regional comparative advantage, the prospects for effective demand, and the intersectoral synergies capable of engendering sustainable growth in productivity, production and trade. From this viewpoint, stabilization of Sahelian food markets needs in equal portions deliberate actions to raise and stabilize effective demand in the general population and purchasing power among the most disadvantaged segments of that population.

G. Are Agricultural Techniques Adapted to the Challenges of the Sahel Available?

Dr. Peter Calkins from the University of Laval, in presenting the major paper on this topic on behalf of a team of researchers from CIRAD, started his remarks by saying that there are three hypotheses advanced for the limited success in stimulating increased growth in agricultural output in the Sahelian countries. They are:

1. Agricultural research has not provided farmers with the necessary techniques to increase their agricultural production and factor productivities;

2. Economic policies have not permitted adoption of many agricultural technologies which are already available;
3. The integration of the crop and livestock techniques developed to date into existing farming systems has introduced long term negative effects on both the physical resource base and social structures.

In an effort to determine to what extent these hypotheses are valid, the authors presented a response oriented around six key questions:

1. What are the principal challenges for the development of Sahelian agriculture?
2. Do techniques exist which can be judged to be adapted to these challenges in both technical and economic terms?
3. Are these adapted techniques already available for use by farmers?
4. What conditions make an available and adapted technique truly suitable in the sense that it does not contribute to resource degradation?
5. What recommendations can one make with respect to policies to support agricultural development?
6. Taking into account the challenges, the existing findings and gaps in research, and the potential environment impacts, what orientations are necessary for Sahelian agricultural research?

The authors then presented a theoretical framework which included the three hypotheses above in a logical order of presentation and provided a basis for responding to the six questions posed. Their responses were presented at the regional level and at the sub-regional and/or micro-regional level. In this way, they attempted to distinguish between challenges faced by farmers and those at a more general macro-level.

At the macro-level, the authors classified the major constraints in three categories:

1. Constraints imposed by the physical and technical environment;
2. Constraints introduced by the macroeconomic situation and policies in place; and
3. Constraints concerning micro-social structures and production systems.

At the farmer level, the authors classified the principal constraints in several categories:

1. Agricultural Constraints

- a. The seasonal limitations on crop production which cause bottlenecks in cultural activities and mean that food and cash crops are generally produced over only one growing season. In this regard, the shortening of rainfall cycles has increased the challenge of developing appropriate technologies.
- b. Use of inputs in intensification efforts is perilous with existing climatic conditions.
- c. Climatic and soil conditions place limits on the potential for production which constraint the farmer's ability to achieve productivity gains.
- d. Possibilities for diversification are limited.
- e. Diseases and parasites limit both crop and livestock production.
- f. Decreasing fallows and overexploitation of resources have caused declines in the fertility of fields and pastures.

2. Food and Marketing Constraints

- a. The lengthening of the "hungry" period after bad cereal harvests.
- b. The increases in cereal prices in the case of bad harvests.

3. Commercial and Financial Constraints

- a. Declines in the prices received for cash crops and the increasing fragility in the financial position of farm units.
- b. The narrowness of local cereal markets due to weak linkages between rural supply and urban demand in the face of competition from imported cereals.
- c. Declines in cereal prices in years of good harvests due to limited demand in urban areas.
- d. The strictly limited possibilities for capital accumulation and reinvestment by farm units in the face of all the constraints they face. This is particularly so with respect to traction equipment and fertilizers.

4. Social Constraints

- a. Poor management in production systems which forces outmigration by younger adults and creates labor shortages.
- b. The non-adaptation of community structures to new conditions and their weaknesses in dealing with questions of resource management and declining fertility in fields and pastures.

With all these constraints, Sahelian farmers, according to the authors, are preoccupied by the risks they face. These risks take multiple forms in production, marketing, finance and social interactions. The risks pertain in both the short and long-term. In this situation, most farmers accord highest priority to defensive strategies in production enterprises. They look to reconcile these defensive approaches with others that would allow them to move from extensive cultural practices to more intensive ones without incurring great short-term risks. Intensification and specialization -- i.e. offensive -- strategies in production are found only among a minority of producers -- generally those with more resources and/or access to income from non-farm activities. For these reasons, one often observes contradictory strategies among farmers: adoption of practices which yield short-term results while compromising long-term sustainability; fighting for resource access within groups; adoption of tactics which increase disparities among groups.

The authors then presented a long discussion of the implications of this environment for agricultural researchers and illustrated how in certain cases innovations had been developed which were adapted to farmers' needs and constraints. They continued by saying that taking into account certain conditions would help researchers improve adoption of techniques by farmers. These include:

1. The importance of the linkages between technical innovations and complementary organizational and social innovations.
2. The importance of "para-agricultural" activities in determining adoption.
3. Conditions relative to the nature and functioning of development actions -- i.e. extension, agro-industrial, project, etc..
4. Conditions in the specific production environment itself -- i.e. land tenure rights, market availability, access to credit, etc..

The authors' principal conclusions and suggestions for the future were as follows:

1. Conclusions

- a. A number of research results have been useful in, at least, partially addressing the challenges of Sahelian agriculture.

- b. Among these, many have been integrated into existing crop and livestock systems.
- c. Other pertinent technical innovations have not been available to producers for two reasons:
 - They do not marry well with the existing production strategies of farmers or the means they have at their disposal.
 - There are external constraints -- macroeconomic or policy -- on production systems which prevent widespread diffusion of the innovation.
- d. In certain areas, research results are not yet available, particularly with respect to development of physical environments and coherent long-term management of local resources.

2. Suggestions To Increase The Availability of Innovations

- a. Deepen the knowledge of the fundamental mechanisms for intervening in the dynamic evolution of local production systems.
- b. Improve abilities to identify and prioritize constraints so as to better target responses at the sub- and micro-regional levels. This will require more real interdisciplinary work by researchers.
- c. Improve the circulation of information between different partners in the research process -- i.e. researchers, development agents, farmers and decision-makers.
- d. Involve researchers in development actions through participation in monitoring units to better understand farmer reactions and the effects of the innovations presented and to reorient research efforts.
- e. Develop systematic and comparative analyses by innovation and region.
- f. Reconcile issues of long-term resource management with the necessity for short-term profitability in agricultural innovation.
- g. In research and extension efforts at the local level, increase the use of pertinent survey instruments to better understand the functioning of local societies.

- h. Identify and use endogenous organizational and technical innovations in research and extension efforts.
 - i. Favor the emergence of socio-professional groups in rural areas which are capable of explaining to researchers in precise terms the technical needs of farmers, constructively criticizing the work and performance of researchers, and exercising control over development activities.
3. Suggestions With Respect To Agricultural Policy
- a. At the Macro-Level
 - Maintain input policies which provide incentives to farmers.
 - Provide secure markets, especially for cereals.
 - Support agricultural, para-agricultural and extra-agricultural activities which generate incomes for farm families.
 - b. At the Micro-Regional Level
 - Invest in essential infrastructure.
 - Favor the emergence of rural agents to support farmers in all aspects -- i.e. pre-planting, production and post-harvest.
 - Local reflection on the most appropriate systems of land tenure and means to manage resources so as to realize greater investment in essential development activities. In this regard, private land ownership is probably not the most adapted solution when compared with the flexible, collective and traditional land tenure systems developed in the Sahel over time.
 - In the present context, innovation must be accompanied by provision of adequate means to permit greater production.

H. Does Private Control Allow Better Management of Natural Resources?

Dr. Jacques Faye of RESPAO in Ouagadougou presented the principal paper on this topic. He pointed out in his introduction that the discussions of Sahelian land tenure and resource management issues had reached a critical turning-point in 1989 at the regional seminar on resource management in Segou, Mali. Faye said that prior to this seminar when discussions were held on this topic, they always centered on how to get local people to participate in government programs. After the seminar, the discussions were focused on granting autonomy and rights to

local people -- individually or in groups -- to own and manage their own resources in the context of more decentralized governmental administration.

He observed that recent studies on resource management in the Sahel by Rochette (1988), ARD (1989) and Lawry (1989) had clearly shown that management by resource users could not be reduced simply to the installation of new techniques and methods for conservation and improvement of the resource base. To achieve success over time, important changes in institutions had to be made and these changes had to respect the interests of all concerned parties. Among these, changes in the rights of ownership and use of local resources, along the procedures and structures for control and negotiation were essential. One can say that to introduce a lasting system of resource management, it is necessary that those who invest in improvements have a guarantee that they will receive the benefits of such investment and that there will be controls and limits on the profits other resource users can later extract.

The author then reviewed the status of existing legislation and its effects on resource ownership and management in the Sahel. He concluded that state ownership and control of natural resources had not produced the results which many had hoped for initially. This was so because Sahelian governments had generally failed to apply their own laws on resource use, except with respect to forestry resources. Moreover, local populations to fill the void had continued to apply customary rights over resources but in a climate of uncertainty which did not encourage investments in better resource management.

Previous experiences with resource management have shown that attribution of clear ownership/tenure rights and the recognition of the central role of resource users in management provide the major incentive for investment in resource conservation and improvement. However, such major changes in approach will certainly pose new problems and carry risks which must be analyzed carefully.

For the rural population, these changes would bring with them modifications in family and social interactions. Within these groups, competition for control of resources risks becoming even more heated than it is today. The processes of individualization and deterioration in extended family relationships already in progress in rural areas could be further accelerated. Increased competition for resources could translate into a worsening of the position of poor peasants and growing inequality among groups. The author then asked rhetorically: "Do we want to move toward having a class of agricultural laborers without land or an increase in the number of people who migrate from the villages forever?" and "Are we going to exclude women and young adults from access to resource ownership and participation in the management of resources?". He concluded that responses to these questions must ultimately come from the village level but not in situations where traditional leaders and the wealthy members of the village have the opportunity to divert the management of local resources to their personal advantage, while the majority of producers see no benefits to themselves from participation.

Faye observed that making producers responsible for ownership of agricultural resources and explicitly recognizing their rights to manage them will not only entail a massive reorientation in

political thinking by Sahelian governments but will entail substantial financial costs in implementation. The recurrent costs of new institutions would in principle have to be supported by the beneficiaries at the same time they were being asked to make capital investments to improve the local resource base -- investments which will have differing benefits depending on the local situation. The author, therefore, was prompted to ask two questions: "Whether the Sahelian governments would have the resources to assist in financing this transition?" or "Whether external donors were ready to support this effort?". In this context, he observed that, if the Sahelian governments no longer have ownership of the resources in question but they are still expected to make necessary investments in them for the public good, then the financial burden will be very heavy.

Moreover, putting in place new legislation with respect to control and management of natural resources would pose difficult political problems. This would be so because giving rural populations real power over the management of resources would inevitably bring into question the position of the "centralized and omnipotent" Sahelian state. Decentralizing state authority and responsibilities and affecting modifications in its relationships with other development agents will not be easy things to accomplish. Developing clear choices in this regard and demonstrating a strong political will to proceed will be indispensable to the transfer of resource ownership and tenure rights to users and in ceding to them responsibility for resource management.

I. Is the Emergence of Local Dynamics a Response to a True Disengagement of the State?

Dr. Marie-Rose Mercoiret of DSA-CIRAD presented the principal paper on this topic. This long paper analyzed the evolution of efforts to permit and stimulate the emergence of dynamic local groups and institutions in the Sahel which would take responsibility for governance of development as the Sahelian governments disengaged from many of their previous activities and decentralized political functions and responsibilities.

This paper proved to be both interesting and too long and complex to lend itself to easy summation -- particularly by an economist. The precis here, therefore, will be limited to a resume of the author's findings as to the factors which favor the emergence of a strong local dynamic with respect to agriculture and development and general conclusions.

With respect to the factors favor a strong local dynamic, Dr. Mercoiret found that it is not sufficient that an action be simply "localized" to create a local development dynamic and "l'interet pour "le local" s'accompagne d'une certaine perplexite quant aux mecanismes selon lesquels emergent et se consolident les processus de developpement local". The author used the analogy of making mayonnaise to illustrate this point in that one is never sure at the start what the final outcome will be. Moreover, if one disaggregates the components of a successful final product, there are no end of ex post explanations as to how good mayonnaise is made but no one can give ex ante explanation of the process.

Nevertheless, Dr. Mercoiret attempted to isolate several key factors. They were:

1. The Existence of a "Espace d'Initiative"

If the state is seen to be omnipresent and omnipotent and if effective action on the local scene is constrained by a constant series of directives, rules, procedures, a priori controls, etc., the area for local initiative is very much reduced. In these cases, one may find passive resistance or overt opposition to the state and/or some innovation at the margin by local groups but rarely a true local development dynamic. In short, one sees a variety of adaptations to the existing situation, but rarely a complete restructuring of fundamental relationships.

2. The Lack of Top Down Approaches in Development

The author observed here that it is not by chance that many of the most innovative local initiatives in the Sahel have occurred in sectors which governments considered marginal or in areas of countries deemed to be less important in the economic sense.

3. The "Espace d'Initiative" Has Social and Cultural Elements

The cultural specificities in certain regions often play a "starter" role in the development of a dynamic of innovation in technical, economic and social activities.

4. The Existence of High Stakes in the Technical and Economic Sense

All local dynamics are predicated, for the concerned actors, a questioning of or changes in the established order, an internal reorganization of local society, and the development of new relationships with the environment writ large. Such reorganizations require a great deal of energy and time to affect and they are not likely to occur unless the participants perceive that there important stakes in achieving or not achieving the changes.

5. The Existence of Local Leaders

Such leaders are often characterized by the following:

- a. Their different perspectives on local conditions gained by residence and travel outside the specific environment.
- b. Their capacity to formulate a "project" -- sectoral or integrated -- from the diffuse aspirations of the community and to present it in such language that is appears "right" for local people.

- c. Their perseverance -- and, even, stubbornness -- in pursuit of their objectives.

But such leaders can only play their role over time if they prove able to delegate responsibilities, create new leadership, and motivate the ranks of a movement.

6. The Existence of External Stimuli

This is so because local Sahelian societies find it difficult to discover within themselves and by themselves solutions to new solutions to their problems. Often the impetus for solutions coming from the outside in terms of transfers or appropriations. The essential change in such appropriations is that the local society is increasingly able to defend its interests in the process of change and to negotiate the conditions under which changes take place.

The author continued the presentation by asking what role the state could play in creating a favorable environment for the emergence of a local dynamic. The question was whether the situation required less state involvement or a different role for the state. The conclusion was that the state probably has an important role to play in this process and that disengagement should not be confused with state abandonment of its "poste de combat".

In this regard, the following elements in a new role for the state were suggested:

1. The formulation and implementation of laws and regulations which serve to liberate and stimulate initiatives of local actors. Among these, priority must be given to measures to create and/or reinforce local public constituencies which can play an important role in local planning, coordination, financial support, and evaluation of local development projects. Concrete state initiatives in this respect are: free election of local officials; transfer of responsibilities to local institutions, coupled with simultaneous transfer of resources; and facilitating the democratization of governmental institutions at all levels.
2. Creation of more flexible approaches to and incentives for local private groups -- i.e. associations, cooperatives, non-governmental organizations, and private companies and individual actors.
3. Demonstration of a will to promote a stable and incitative economic environment which allows full local participation in the processes of development and permits farmers to obtain full benefits from their innovations. This supposes that the state has a role in supporting the organization of agro-industrial networks -- i.e. filieres -- and that producer prices are fixed in a transparent manner.
4. Formulation and promotion of development interventions for which both the objectives and the methods have been negotiated from the start with concerned

local participants and are based in an open, flexible and evolutionary approach. This means specifically that external development agents must become much more adept at explaining technical, economic and organizational options to local people and, more importantly, presenting them in a manner that does not prejudge which options will be adopted. This new approach also dictates the installation of permanent mechanisms for negotiation among participants to make necessary readjustments based on joint monitoring and evaluation of activities.

5. Provision of qualified personnel to serve as advisors to local individuals and groups.
6. Transfer of the necessary material and financial resources to the local level simultaneously with the transfer of greater responsibilities.

In this respect, it is very legitimate to say that totality of the measures taken by the state to stimulate a local dynamic should constitute a "national policy for local development".

J. Is the Agriculture of Sahelian Countries Viable Without Transfers? What is the Cost of Such Transfers? Who Supports Them?

Although the present author was asked to comment on this topic in his terms of reference, to his knowledge, there was no such formal presentation during the Montpellier seminar. There is, therefore, no basis for a summary of comments on this topic from the seminar proceedings and interactions.

III. RECOMMENDATIONS FOR ADDITIONAL POLICY ANALYSIS

The recommendations for additional policy analyses discussed here relate directly to the topics formally presented at or discussed in informal sessions after the Montpellier seminar. As such, they constitute a modest supplementary research agenda for consideration. The research topics are discussed below in rough order of priority under two headings.

A. Near Term Research Needs

1. The Effects and Implications of Devaluation on Sahelian Agriculture and Food Security

It appears to me that one of the principal conclusions that should be drawn from the Montpellier sessions is that a CFA franc devaluation is inevitable in the medium term --i.e. before 1994. All of the presentations on the subject concluded -- some, grudgingly -- that devaluation was a last major macroeconomic tool left in the Sahel's structural adjustment kit. And, most specialists appeared to agree that its use was warranted to correct distortions and adjust parities between the francophone Sahelian states and their major trading partners. Finally, there seems to be general agreement among the major donors that existing relationships cannot be modified on a sustainable basis by resort to the "second best" and piecemeal alternatives to devaluation being employed at present -- i.e. increasing tariffs, subsidizing exports, fiscal restraints and deflationary measures.

If CFA franc devaluation is to be considered as inevitable and discussions have in effect shifted away from questions of feasibility and toward how this major change is to be affected, then I believe the Club du Sahel and the external donors should seize the opportunity to be ahead of macroeconomic events by sponsoring a series of country and commodity-specific studies of the likely effects and implications of different devaluation scenarios on existing trade patterns, balance of payments, domestic resource costs, and government finances.

On the one hand, it seems certain that any attempt to approach devaluation on a regional basis -- i.e. through the existing monetary union -- will have very different effects on and implications for countries and commodities throughout francophone West Africa. On the other hand, the implications of certain countries -- e.g. Cote d'Ivoire or Senegal -- going their own way in monetary adjustment are not clear for either those countries or their regional trade partners. Since a regional CFA franc devaluation within the existing monetary union -- or individual country devaluations outside it -- is probably the biggest macroeconomic event on the horizon, it would be a pity if the only contribution the Club du Sahel and its associated donors could make was an *ex poste* assessment of the impacts of devaluation(s) in the francophone countries at an international seminar in 1998 or 2000.

The CFA franc fixed parity relationship with the French franc is the last constant in the financial and trade calculations in the Sahelian and coastal francophone countries. When that prop finally goes, each of the francophone states in West Africa will be operating within a completely new economic structure with respect to its relationships with regional trade partners and world

markets. Serious quantitative studies need to be done now to assess the probable country-specific effects of devaluation on both domestic economies and on regional and international trade relationships. Such information and analysis is needed to prepare the concerned governments for the transition they will all be experiencing.

Given the existing patterns of trade, I believe that a series of country-specific studies should be done in the context of three sub-regional groupings. These could be more or less along the lines of the groupings outlined in recent studies by Egg and Igue and others. One grouping could be Cameroon, Chad, Nigeria, Niger, Benin. A second could be composed of Burkina Faso, Mali, Cote d'Ivoire, Ghana and Togo. And, a third one would be composed of the remaining mainland countries to the west. With respect to the major commodity "filieres", I think the concentration should be on cotton, groundnuts and livestock. The cereals/food security/devaluation questions should be handled in the broader context of the country-specific studies a la the Delgado argument about the importance of cereals as wage goods and their multiple effects of production costs and government finances and trade policies.

2. Comparative Advantage and Variability in Cost Components for Major Commodities

Delgado's communication on the evolution in the components of domestic resource costs and its relationship to comparative advantage for major Sahelian commodities was, in my opinion, one of the very few papers at the seminar which actually attempted to present significant new material. While I agreed with most of the author's initial findings and conclusions intuitively, I was not entirely comfortable with the depth or breadth of the quantitative analysis underlying them.

I believe Delgado's initial findings are very important as a point of departure for policy decisions on Sahelian resource allocation. He -- and other researchers -- should be encouraged to pursue this approach in a more systematic and quantitative manner for a wider range of countries and, possibly, commodities -- i.e. maize and rice. If, as the author suggests, this means a series of targeted primary data collection exercises in specific areas of the Sahel so be it.

3. The Utility of Agricultural Research Results in the Cropping Zone Above the 800 Millimeter Isohyet

I was frankly **very** disappointed with what I perceived to be the lack of an effective response by agricultural **researchers** to the question of whether or not Sahelian and/or international research organizations **had produced any new agricultural techniques which were technically, economically and socially superior to those already in use in the region.** After listening to the major presentation, the session respondents and the abbreviated general discussion, and reviewing the existing literature, I was more at a loss than ever as to **exactly what new crop and livestock techniques and technologies have been added to the inventory of research results in the last decade to raise hopes for increasing factor productivities in agriculture.** And, this applied most particularly to what new responses researchers have to offer for the cropped sub-region in the

Sahel north of the 800 millimeter isohyet, where cotton is not grown and animal traction has not been universally adopted.

With this problem in mind, I believe it would be very helpful for Sahelian and donor decision-makers alike to have a series of state-of-the-art studies from the agricultural research community which specifically address the question posed at the seminar -- i.e. Are there really proven adapted agricultural technologies on the shelf for immediate use by Sahelian farmers? And, if so: What specifically are these new innovations? Are they applicable across the region or only in certain sub or micro-regions? What specifically are the scopes for increasing in factor productivity through farmer adoption of these new innovations?

At the Montpellier seminar, all the factors -- technical, economic and social -- which might impinge upon adoption and adaptation of new agricultural techniques were discussed without anyone, to my mind, ever really addressing the central question of whether or not there are, in fact, (a.) new technical agricultural innovations ready for dissemination to farmers and (b.) innovations that are demonstrably superior to existing technologies at the farmer level.

I can only suggest in this regard that agricultural researchers need to be asked once again to specifically answer the excellent question posed at the Montpellier seminar, without resort to a great deal of discussion and elaboration on the conceptual bases and methodologies for analyzing potential innovations. Any studies along these lines should be organized to present in a clear and concise manner an appreciation of exactly what new innovations have been tested and proven to be acceptable for dissemination to Sahelian farmers over the period since 1975. If adoption of certain innovations has been limited to specific sub-regions, then the studies should endeavour to state exactly what conditions have constrained broader adoption of the technique in question. And, finally, the studies should isolate in very specific terms where agricultural research to date has been unable to provide additional guidance on improving factor productivities in existing crop and livestock systems and what the realistic prospects are for research breakthroughs in these areas before the end of the century.

4. Risk Analysis and Risk Reduction in Sahelian Agriculture

I was pleased to see that an attempt was made to introduce the concept of risk as a factor influencing farmers' decision-making and constraining aggregate and crop-specific supply responses. The major deficiency in the presentations on this topic was that the participants were not always careful to distinguish in their discussions between situations influenced by risk -- i.e. events for which one can estimate probabilities of occurrence -- and those subjected to uncertainty -- i.e. random events. The consequences of risky and uncertain situations may appear similar but I believe it can be shown that the prospects for dealing constructively with the former are better and usually less costly than with the latter.

A more focussed discussion could, I believe, have begun to isolate specific instances where risk plays a significant role in reducing Sahelian supply response. For these cases, actions could then have been proposed and analyzed.

In the specific areas of risk analysis, I believe that more quantitative research is needed in at least two areas. The first is in more rigorous application of risk analysis techniques in evaluating which technical agricultural innovations under testing should be disseminated to Sahelian farmers. For many reasons, techniques and packages of techniques developed on research stations tend to have lower mean outcomes with more variability around the means when applied at the farm level. Yet, there is relatively little evidence in the Sahelian literature that agricultural researchers are seriously applying known methodologies for risk analysis in evaluating new innovations and/or explaining farmers' responses to them.

I see this type of analysis as highly relevant to the questions posed in the previous section because potential for innovation based on average technical coefficients often tends to decline dramatically if one takes into account the variability around the mean outcome estimates.

With respect to risks faced by producers in other areas -- i.e. market interactions, prices, financial dealings, etc. -- some excellent work has already been done on the costs and benefits of government interventions in price stabilization and crop insurance schemes. I can only suggest that this work needs to be extended. With this in mind, I believe that on-going studies, which have tended to focus on the descriptive details of how markets function in the region, might in the future be focussed more sharply on assessing potential costs and benefits of specific policies and programs directed at reducing risks to producers, consumers and market intermediaries.

For example, several participants at the seminar continued to advocate floor pricing schemes for domestic cereals markets -- i.e. maize, millet and sorghum -- as one means of mitigating risk to producers and creating additional incentives for growth in domestic cereals supply yet, to my knowledge, there are no recent quantitative studies of the potential effects of such a policy on Sahelian government finances or on market agents -- producers, consumers and intermediaries. In another area, Staatz et al have concluded that lack of respect for contracts has had negative effects on both input and output markets in the Sahel but research has not yet been extended to quantify the losses or to analyze possible government actions aimed at mitigating them. One final example would be in the area of improved market information, where many researchers have postulated losses in market efficiency due to the risks to market agents of inadequate or inaccurate information but I have not seen any case studies which weighed estimated losses in market efficiency against the costs of improving market information systems.

5. Comparative Advantage in Livestock Production and Marketing

I sympathize with those participants at the Montpellier seminar who believed that it was time to reassess the actual potential for Sahelian livestock production and trade in the 1990s. Clearly many factors have changed with respect to livestock production and marketing patterns since the classic SEDES and CRED studies on regional meat marketing were submitted ten or more years ago and the Club du Sahel studies of livestock situations in Niger, Burkina Faso and Mali were finished in the mid-1980s.

While it is certainly true that many factors continue to work against the development of a vibrant

and remunerative trade in livestock and livestock products between the Sahelian and coastal countries -- e.g. higher transport costs, greater competition from cheaper extra-African imports, development of livestock enterprises in the coastal savannah, overvalued exchange rates, etc., I believe that the really significant changes in the overall situation have occurred at the production level in the Sahelian countries themselves. In this regard, I think that changes in land use patterns, livestock ownership and producer preferences for different types of livestock, combined with the obvious declines in transhumant and nomadic livestock systems, are having greater impacts on the Sahelian livestock situation than any of the changes in the regional trade system per se. Most of the latter changes are in my opinion merely variations on the themes already evident in the late 1970s, whereas the former changes are newer and more basic and they have not been sufficiently analyzed in any of the recent livestock studies I have seen.

In the regard, I see Delgado's comments on the renewed potential for a Sahelian dairy industry and the importance of linkages between increased productivities in cereals and export crop production and livestock potential, coupled with Dolle's observations on the growing importance of small ruminants in production and trade, as extremely relevant to a complete assessment of Sahelian comparative advantage in livestock products. While no one can deny the importance of studies aimed at updating information on factors affecting the long distance trade in live cattle, I am not sure in my own mind that these studies by themselves would tell us much more than we know already. Moreover, by concentrating primarily in this area, I suspect we would neglecting the opportunity to take a hard look at what may be new opportunities for different types of livestock production and marketing.

I would recommend, therefore, that, if there is renewed interest in evaluating Sahelian livestock potential, we start by jettisoning many of our preconceived notions about the expected dimensions of the operative production and trading possibilities. I would also recommend that any studies be multidisciplinary in nature to take full advantage of valuable contributions that can be made by specialists other than economists in assessing what I think is a new and fundamentally different production situation in the Sahel. Such studies would of course be longer term, more complex and undoubtedly more costly than those proposed in Jossierand's paper but I think, if they were properly designed and executed by a multidisciplinary team, they would ultimately give us a much deeper appreciation of where the Sahelian comparative advantages in livestock production and marketing really lie.

B. Longer Term Research Needs

Placement of ~~these three~~ research topics in the longer term category does not imply any intention to deprecate ~~their~~ importance to Sahelian development. They are placed here as a reflection of their inherent complexity and my feeling that, if these problems are to be resolved, the process will entail a long and difficult adjustment. Institutions and groups having once amassed power and obtained access to resources do not easily cede their privileges and prerogatives to others. Genuine transfers of responsibilities and resources from centralized Sahelian governments to local level governing institutions and private groups and individuals would be an enormous change for the better in the region but it would also entail a complete reworking of existing relationships

-- not only between Sahelians at the center and local levels but also between external agencies and the Sahelians. Socio-political and economic relationships would be restructured more fundamentally by decentralization and changes in resource ownership and management than by anything that has occurred to date under the rubric of structural adjustment.

Unfortunately, all three of the research areas below are considerably outside my areas of expertise. I have listed them here in recognition of their individual and collective importance to the future development of the Sahel -- since they are intimately related to one to the other.

1. **Decentralization of Government and Stimulation of Local Development Dynamics**
2. **Adjustments in Resource Ownership, Tenure and Management**
3. **Agricultural Innovation on a Sustainable Basis**

ANNEX A

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